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Global meta-analysis shows action is needed to halt genetic diversity loss

In the most comprehensive global analysis of genetic diversity ever undertaken, an international team of scientists has found that genetic diversity is being lost across the globe but that conservation efforts are helping to safeguard species.

The landmark study „Global meta-analysis shows action is needed to halt genetic diversity loss”, published in the pre-eminent scientific journal Nature right now, was conducted by an international team of more than 50 researchers from around the globe:

<https://www.nature.com/articles/s41586-024-08458-x>

The data spans more than three decades (from 1985-2019) and looks at 628 species of animals, plants and fungi across all terrestrial and most maritime realms on earth. Two-thirds of the populations analysed are declining in genetic diversity but conservation efforts designed to improve environmental conditions, grow populations and introduce new individuals for breeding – for example habitat restoration and animal translocations – are sustaining, and in some cases increasing, genetic diversity in populations.

Frank E. Zachos, head of the Mammal Collection at the Natural History Museum Vienna and one of the study’s authors, said: “There is no denying that biodiversity is declining rapidly across the globe – but there is also hope. Actions taken by conservationists can reverse these losses and help to create genetically diverse populations that can better meet the challenges of the future.”

The team of scientists used innovations in data analysis to gain new insights from studies carried out decades ago. Creating a common measurement scale, they were able to make comparisons between studies, even when they used different methodologies and collected genetic data in different ways. “This approach enabled us to trace genetic diversity through time at an unprecedented scale and in a way that was not possible in the past, which is a huge benefit when we are looking at populations and trends on a global scale”, Zachos said.

Conservation efforts that could improve or maintain genetic diversity include translocations – where animals are moved between populations to benefit a species or ecosystem – habitat restoration, population control – where some individuals are removed to improve conditions for those that remain – and controlling feral or pest species.

Successes include the translocation of arctic foxes and greater prairie chickens into existing populations in Sweden and North America respectively, and the effective treatment of disease within black-tailed prairie dog populations, which has improved the health of colonies in north-central Montana in the US.

The authors hope the findings will encourage more conservation efforts and lead to increased protection for populations that are currently not managed. Despite successes, there is no reason to be complacent. Two-thirds of the populations analysed are facing threats, and among these populations fewer than half received any kind of conservation management. It is vital to learn from what is working so that species and their populations can be protected in the long-term.

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