

Genetic rescue boosts recovery of Australia's endangered mountain pygmy possums

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Mountain pygmy possum. Credit: Dr Andrew Weeks, University of Melbourne

For the first time, a breeding technique known as genetic rescue has

been shown to increase population numbers and survival rates of the endangered mountain pygmy possum, now at their highest numbers since 1996.

The study was conducted by a team from the University of Melbourne, La Trobe University, CESAR, Mt Buller Mt Stirling Resort Management, and the University of New South Wales.

Dr Andrew Weeks from the University of Melbourne led the project, published in the international journal *Nature Communications*.

Genetic rescue was used to introduce male mountain pygmy possums, *Burramys parvus*, from a healthy [population](#) at Mt Hotham, to a recipient group of females at Mt Buller. The two groups had become physically isolated from each other over 20,000 years.

This isolation had led to inbreeding and a lack of the genetic variation that is essential for overcoming disease and ensuring the ability to thrive.

Dr Weeks says that since the genetic rescue program began in 2011, the possum population has gone through rapid growth and is now larger than when the population was first discovered in 1996.

"Before 2010, there was thought to be only a handful of individuals at Mt Buller," Dr Weeks says. "Now, Mt Buller females from the genetic rescue are bigger and have more offspring that survive longer than the progeny of pygmy possums born outside the program. We now estimate the population to be over 200 possums," he says.



Mountain Pygmy possum in hand. Credit: Dr Andrew Weeks

Co-author Dr Ian Mansergh from La Trobe University says the study's findings mark an important development in conservation management.

"Our study confirms genetic rescue as a successful conservation technique, especially when used for small, isolated populations of threatened species," Dr Mansergh says.

Along with genetic rescue, there was also a program of habitat restoration, predator control and environmental protection instituted by the land manager, Mt Buller Mt Stirling Resort Management.

The researchers say this was essential to avoid losing the benefits of genetic rescue if populations cannot expand and still face the threats that reduced the population in the first place.

Dr Weeks and the University of Melbourne's Professor Ary Hoffmann, who co-authored the [possum](#) paper, are now also leading a genetic rescue program for the critically endangered Eastern Barred Bandicoot at Mt Rothwell Conservation Centre near Little River in Victoria.



Eastern Barred Bandicoot. Credit: Dr Andrew Weeks

Prof Hoffmann says the long-term hope for genetic [rescue](#) is that it will

provide endangered animals with enough [genetic variation](#) to adapt and evolve to new challenges, such as climate change.

"These animals are now facing an extra threat. They are experiencing physical isolation and introduced predators as well as climate warming," Professor Hoffman says. "The hope is that animals can adapt if we give them the genetic tools to do so.

"We have shown the technique is successful in the [mountain pygmy possum](#), and hope the Eastern Barred Bandicoot can recover if they are also given enough support."

More information: Andrew R. Weeks et al, Genetic rescue increases fitness and aids rapid recovery of an endangered marsupial population, *Nature Communications* (2017). [DOI: 10.1038/s41467-017-01182-3](https://doi.org/10.1038/s41467-017-01182-3)

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