Split reserves increase bilby's survival chance

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Australia's shy Easter bunny alternative, the endangered bilby, will have a far better chance of surviving deadly predation by feral cats and foxes if they are kept in several protected areas instead of a single large area, scientists say.

Research at the ARC Centre of Excellence for Environmental Decisions (CEED) reveals that establishing entirely new fenced areas, rather than expanding existing ones, will provide better long term protection for highly vulnerable animals against feral cats, dogs and foxes, diseases, or catastrophes such as fires and floods.

"Australia used to have two species of bilbies. When times were good, these marsupials were distributed throughout the landscape," says Dr Michael Bode of CEED and The University of Melbourne.

"But after years of drought and habitat degradation, the populations contracted and, because these bilbies didn't know how to protect themselves against wild cats and foxes, their populations crashed.

"The lesser bilby became extinct in the 1950s, and the greater bilby has been driven to the margins of its former range."

To save the greater bilby, a predator-proof fence was built in Queensland's Currawinya National Park in 2001, says Ms Kate Helmstedt of CEED and The University of Queensland. "These marsupials breed like crazy, so if you can build a fence that protects them from foxes and cats, you come back and find hundreds of them.

"These fences are large – the bilby fence encompasses 25 square kilometres – but it is still only a single area."

Dr Bode says this approach not only applies to the bilby, but also to other threatened native marsupials such as the Tasmanian devil, or Gilbert's potoroo (one of the world's most endangered mammals).

State governments and conservation non-governmental organisations (NGOs) such as the Australian Wildlife Conservancy are all planning to extend the use of fenced reserves to protect other endangered terrestrial wildlife. However the dilemma is whether to expand existing successful fence projects, which would be easier and cheaper to manage, or to set up new fences somewhere else, he explains.

"This is an important consideration because building, monitoring and maintaining conservation fences are extremely expensive," he says. "If we're spending that much money, we need to invest it in the best way possible."

In their study, the CEED researchers found that while it's cheaper to expand an existing enclosure onto nearby land, the threatened animals will stand a better chance of long term survival if they are protected in widely-separated enclosures.

"Having two or more independent protected areas ensures that the mammals are spread across 'two baskets'," says Ms Helmstedt. "Feral cats desperately want to get into these 'promised lands' and if they do, they can each kill dozens of native animals in a single night.

"If a fence is breached on your only protected enclosure, the effects can be devastating.

"For example, the fence around the protected area in Currawinya

National Park was recently damaged by flooding. Feral cats broke into the 2,500 hectare compound and decimated one of the last populations of Queensland bilbies. It was a tragedy."

Dr Bode explains that the greater bilby might survive an attack provided some individuals are being held in captive breeding facilities – but the risks are far greater for other endangered wildlife.

"Using Gilbert's potoroos as an example, there are fewer than 100 of these marsupials left, and their habitat can be prone to fires," he says. "If we tried to protect them within one fenced area and a big wildfire hits, they'll all die, and that's it.

"But if we have two fenced areas, the risk of losing the entire population is halved.

"So while it may cost more to build and maintain several fenced areas, we're better off in the long term if we want to keep these animals."

More information: "Cost-efficient fenced reserves for conservation: single large or two small?" Kate J. Helmstedt, Hugh P. Possingham, Karl E. C. Brennan, Jonathan R. Rhodes, and Michael Bode. *Ecological Applications* 2014 24:7, 1780-1792 DOI: 10.1890/13-1579.1

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