

Protecting native birds by manipulating rats' sense of smell

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The researchers manipulated the rats' sense of smell to keep them from preying on vulnerable species. Credit: Mal Weerakoon

(Phys.org)—Rats' keen sense of smell can be exploited to dramatically reduce their attacks on native birds, researchers from the University of Sydney have shown. The technique could be adapted to protect vulnerable species worldwide.

"Introduced [black rats](#) (*Rattus rattus*) are a major threat to the conservation of many bird species worldwide so a new method for reducing their impact is good news for conservation," said Dr Catherine

Price, a Research Associate from the University's School of Biological Sciences.

Price is the lead author of the study, published in the [Proceedings of the National Academy of Sciences](#) on 16 October. Professor Peter Banks, also from the University's School of Biological Sciences was the other contributing author.

"Working with wild populations of black rats in the bushland of Sydney Harbour and Lane Cove National Parks in NSW we discovered that we could increase the survival of birds' eggs without removing a single rat.

"An added advantage of this method is that it is not lethal to the predator. That means it is especially suited to protecting a vulnerable [prey species](#) when the predator is also endangered or under threat," Price said.

Mammal predators live in a richly layered world of smells and have to learn to detect and recognise immense numbers of odours and distinguish minute differences between them. That ability could stop them being successful predators if they were not also able to quickly and efficiently disregard superfluous information.

"We exploited this ability in rats by exposing them to the [smell](#) of quail [faeces](#) and feathers. In this case domestic quail were used as a stand-in for any new species of native bird because their smell would be unfamiliar to the rats," Price said.

"When the rats investigated the smell they found no live prey so their interest went unrewarded and after about three days they effectively lost interest in the bird odour."

The researchers then placed real quail eggs in artificial nests throughout

the rats' habitat. They found they had a 62 percent greater survival rate than eggs that were introduced without first exposing the rats to the unrewarded quail smell.

By pre-exposing the rats to the smell they learnt to ignore a cue that did not bring any reward. This allowed the introduction of prey to occur without attracting the rats' attention and reigniting their interest.

"This technique of smell pre-exposure could be widely used in conservation. It has the potential to benefit many species currently threatened by rats, such as the North Island robin and red-crowned parakeet in New Zealand. We hope it can also be used to help protect endangered Australian species, such as greater stick-nest [rats](#), burrowing bettongs and even loggerhead turtles against a range of introduced mammal predators.

"Our research introduces a different approach to pest management which manipulates normal predator behaviour. We hope it encourages others to think outside the square to tackle conservation problems."

Provided by University of Sydney

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