

Windy Hill Sanctuary

Research into Rat Behaviour/Personalities

I'm Thomas Bodey, and I am working at the University of Auckland as part of a Marie-Curie Global Fellowship grant from the EU. My research involves looking at individual variation in behavioural responses in wild invasive rats or – cutting the jargon - 'animal personality'. Given that it's impossible to get inside a non-human head to actually assess their personality, what I've been doing is to examine a range of behaviours to see when and where individuals differ in their responses. For example, animals often differ along a bold-shy spectrum – how readily an animal will approach a novel object or explore a strange space for example. Such individual differences are being increasingly found across all kinds of animals from prawns to albatross to meerkats. Some individuals are bolder, more active, or more social than others, and this variation can then affect other aspects of their lives such as how they find food. Within the context of invasive species this is also important because a control device of any type is a novel object, and so if some individuals really don't choose to interact with them, then if your goal is to remove them, you have a problem.

I am looking at individual variation across a range of niche dimensions (behaviour, cognition and diet) in everyone's favourite critter, the humble rat. New Zealand is 'blessed' with three species – all invasive and globally widespread – and I have been concentrating on two of these - the Black/Ship Rat *Rattus* and the Pacific Rat/Kiore *R. exulans* - on a number of offshore islands around the Hauraki Gulf. This includes Aotea/Great Barrier Island where I have been live trapping rats on some of the Aotea Conservation Park land adjacent to Windy Hill, running them through behavioural trials in the field, then releasing them in order to do it all again.

Right now I have a lot of videos of rat behaviour, but ultimately this work should provide insights into ecological theory – for example, the ways in which competition between individuals and species affects their individual behaviour. It will also have applied applications for invasive species management. New Zealand, like many oceanic islands, is in the position of having no native terrestrial mammals, and thus can manage invasive mammals, should they choose to do so, in relatively straightforward ways. However, elsewhere in the world, management must avoid harming native mammal species. Triaging of the system, making adjustments to maximise the chances of catching invasive individuals with the greatest potential to cause harm, would be the most cost-effective way forward if eradication is not possible or desirable. And if eradication is the goal, then you need to know there aren't individuals that will avoid all control mechanisms. Either way, identifying those individuals with a 'troublemaking personality' is key.



Rat in a cage trap



Thomas weighing a rat



Snipping off whiskers for diet analysis



Overhead camera to film rats in transparent cage



Overhead camera.