



Windy Hill Sanctuary Citizen Science Series #7

How do you know your pest management is making a difference?

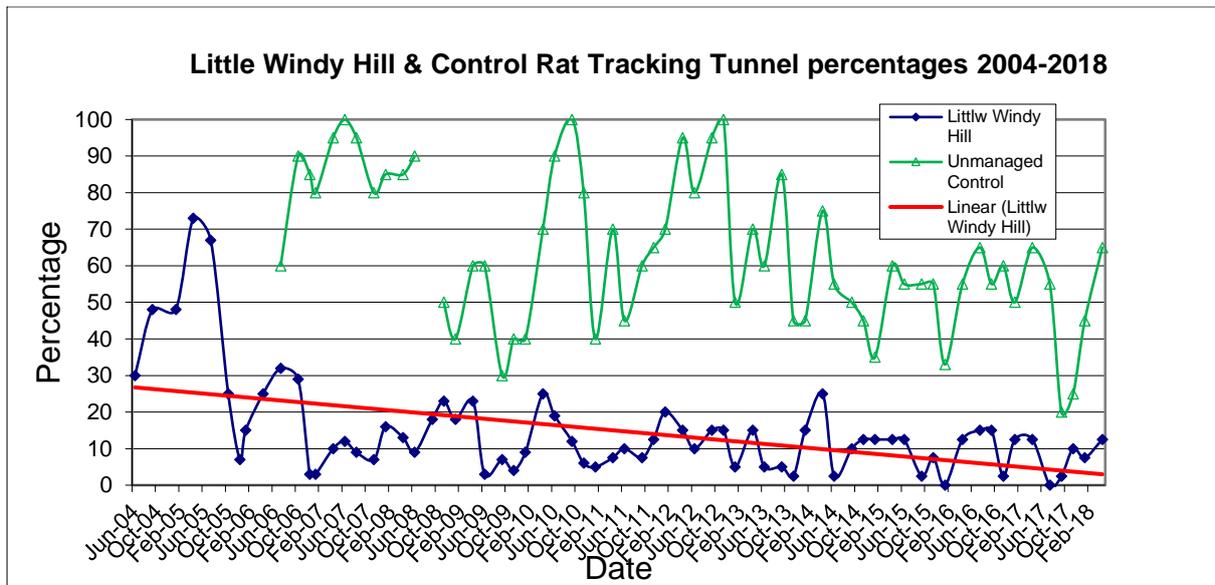
In short, the answer is to count, count, and re-count the species you are trying to protect or cull over long periods of time. In the Windy Hill Sanctuary, we have been counting birds annually since 2000; weta, lizards, invertebrates, and seedlings since 2006; and freshwater stream species since 2008. At the same time, we have been monitoring what our rats are doing five times a year using tracking tunnels and by recording our trap catch. Over 19 years this has given us vast amounts of data against which to measure how well the suppression of rats, mice, feral pigs and cats improves the lot for our native species. This article is about how we measure the densities of rats present in the bush before, after, and without suppression.

Back in the 90's DoC designed a rat tracking tunnel and a protocol for their use as a NZ wide way of monitoring rat densities. The tunnel is a simple rectangular tube into which fits a cardboard card with a section of non-drying ink in the centre. Rats are lured in by a blob of peanut butter and leave their prints. The cards are left out for just one night and a percentage is calculated from the number of cards with prints. Rat tracking tunnels are considered a fairly 'raw' methodology as weather, the moon cycle, and a range of other variables like rat resistance to entering a tunnel effect the results. However, used consistently over time, they give us a picture of what rats are doing within any area and show how effectively any type of suppression method is working.



Checking a rat tracking tunnel

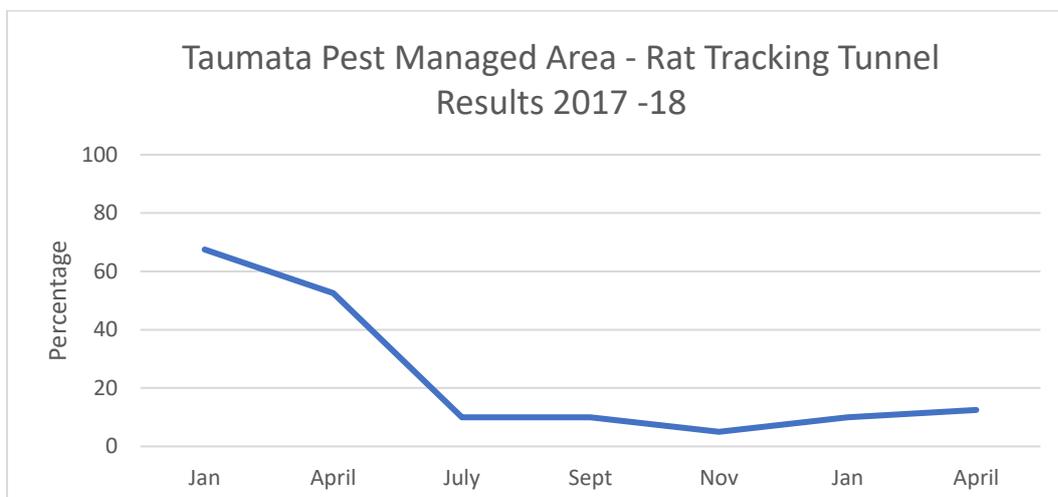
In the Sanctuary we have 195 rat tracking tunnels stations set out in lines of 5 or 10 on random custom bearings through pest managed areas and similarly in unmanaged Control areas. In late January, April, July, September, and November the tunnels are set up with their inked pads and collected the following day. The results are graphed and give us an idea of how well our rat management is working plus show the annual rise and fall of rat numbers. Generally, rat numbers are highest in autumn (March to June) and lowest around September.



The Little Windy Hill pest managed area has had regular tracking tunnels undertaken since 2004. The graph above shows the high number of rats still present with just trapping (from 1999) until mid - 2005 when the use of cholecalciferol (Vitamin D3) was prudently introduced. The green line shows the densities of rats in our unmanaged Control site. The red trend line shows the gradual overall decline of rats using a balance of trapping and baiting to the current time. The peaks in most years are in autumn when rat numbers are driven up by the high food availability. This is also the time that many people find rats coming inside buildings and sheds prior to the winter.

For best conservation outcomes the aim is to have an annual average of 5% tracking tunnel rates but this is very hard to achieve on Barrier where our temperate climate means that rats breed all year round producing litters of 3-10 after a 20 day gestation. This is further complicated by having both ship rats and kiore who have slightly different breeding cycles.

Tracking tunnel graphs are particularly clear when showing the decline in rats in a previously unmanaged area like the new to Sanctuary 'Taumata' pest managed area. Pest management commenced in January 2017 using a new method of tree baits 'pulsed' in trees for short periods of time and then removed.



The early results indicate that this has been a successful method minimising pest management effort, reducing the time bait is in the environment, and the cost of tracks and stations.

Keeping a record of our trap catches also provides us with a lot of information about what the rats are up to. Each trapping day the count is recorded and then totalled for each area for each month. The table below shows the total rodent catches between 2011 and 2017.

2011	2012	2013	2014	2015	2016	2017
3144	2859	2649	2525	3127	3795	2543

Between 1999 and March this year we have trapped a total of 52,160 rats and mice with an unknown number baited. With numbers like this there is no doubt that ship rats, mice and kiore are a serious threat to the survival of many of our native species and, dauntingly, there is not a single bit of the Barrier landscape that they cannot reach.

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