

Comparisons of Indicator Species  
between  
managed and unmanaged land  
on  
Great Barrier Island





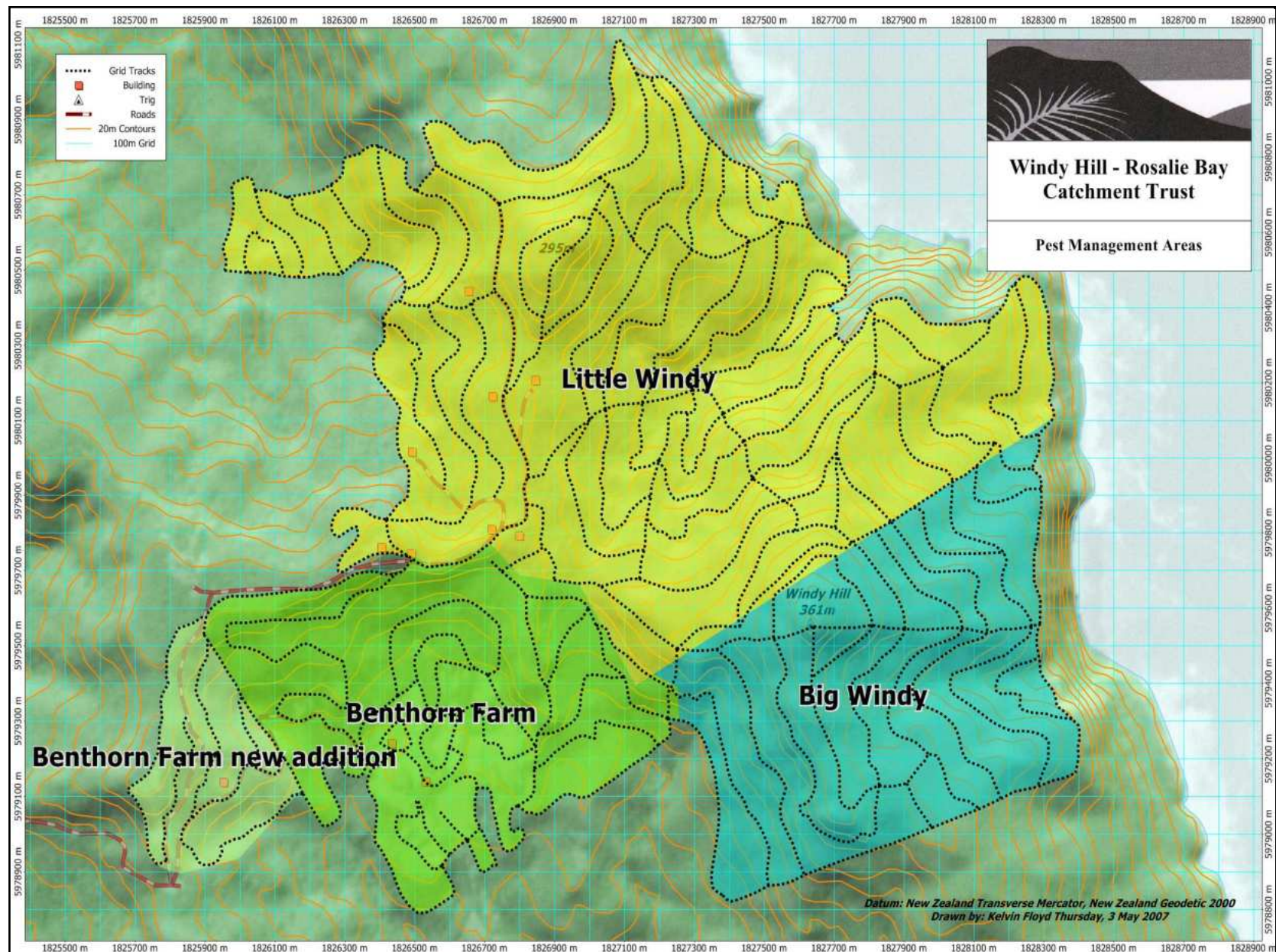
## Windy Hill Rosalie Bay Catchment Trust –

90kms north east of Auckland, NZs fourth biggest island

28,000 hectares

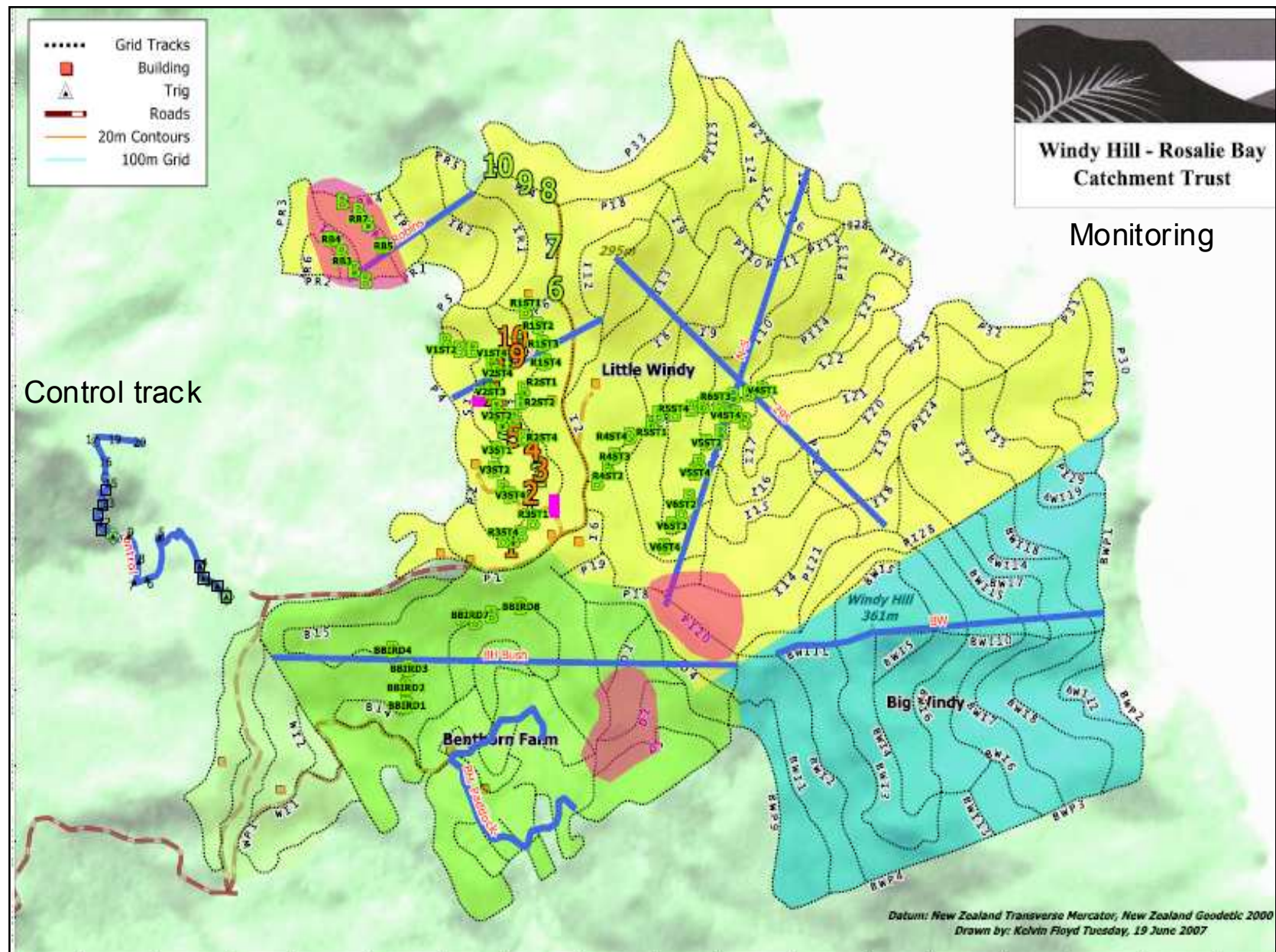
No possums, no mustelids, no norway rats, no hedgehogs, no feral goats or deer





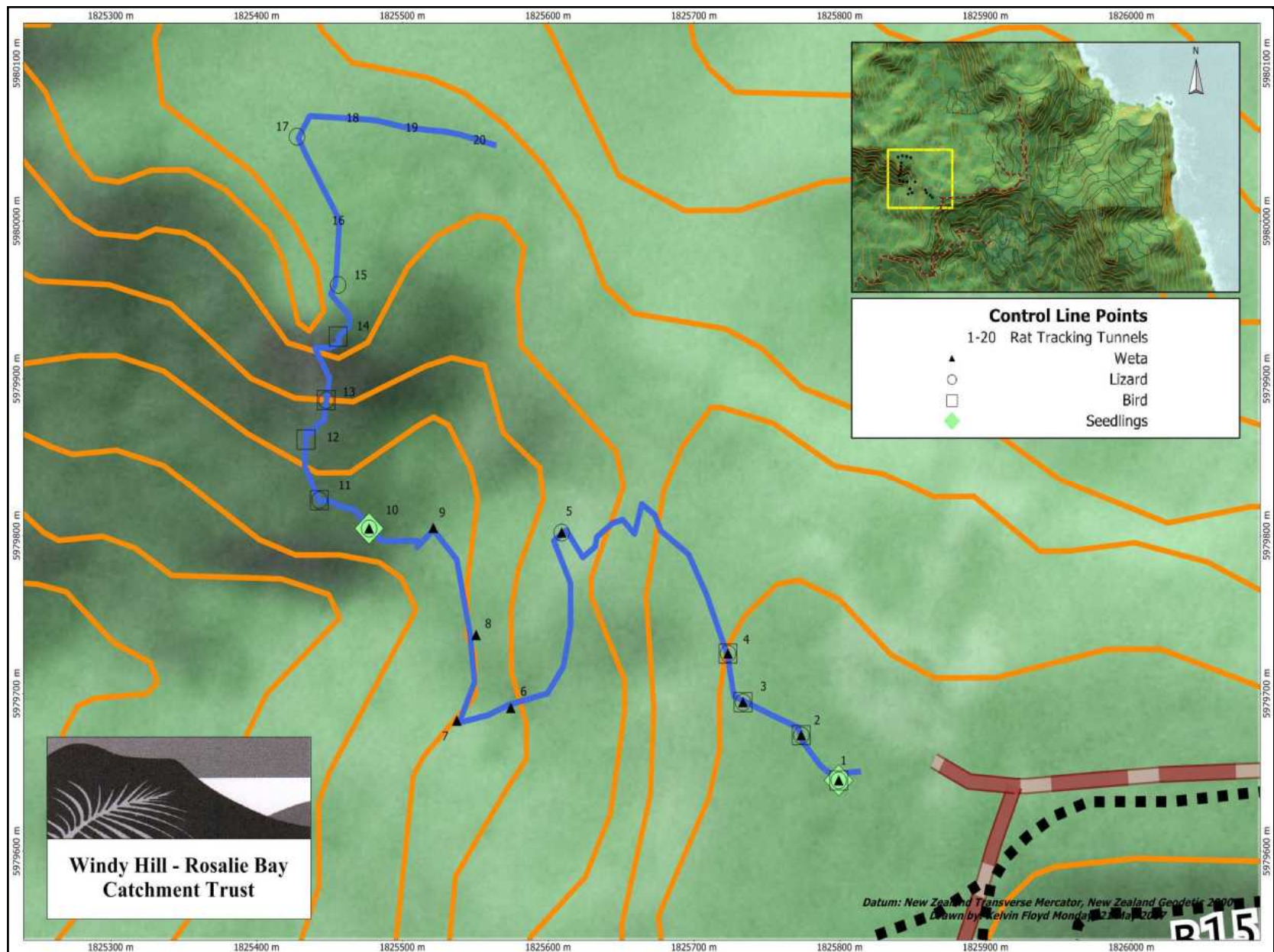
The objective of the Trust is to manage densities of invasive plants and animals to low levels to improve outcomes for native species and sustain and improve biodiversity. The Trust has developed a network of over 60 kms of tracks established in three management areas with over 3000 rat traps and 80 cat traps and systematically culled are ship rats, kiore, mice, and feral cats. While the project is essentially trapping based twice yearly pulses of toxin was introduced in August 2005 when after an analysis of trapping tunnel and catch data revealed that rats could not be reduced below 30% using traps only. With such a small suite of pests it has been difficult to compare conservation outcomes with other projects that have a greater variety of pests with different interspecies dynamics.





The Trust has therefore established quite a comprehensive monitoring programme to measure conservation outcomes within the sanctuary area. Birds have been monitored twice a year since 2000 in a variety of bush habitats, rats monitored using tracking tunnels five times a year but until last year were monitored monthly, and seedlings, lizards and weta monitoring introduced last year in conjunction with a control monitoring programme on unmanaged land with a grant from the Biodiversity Advice fund. The programme "To Protect it you have to measure it" chose the same five indicator species to compare their presence and abundance between managed and unmanaged sites.





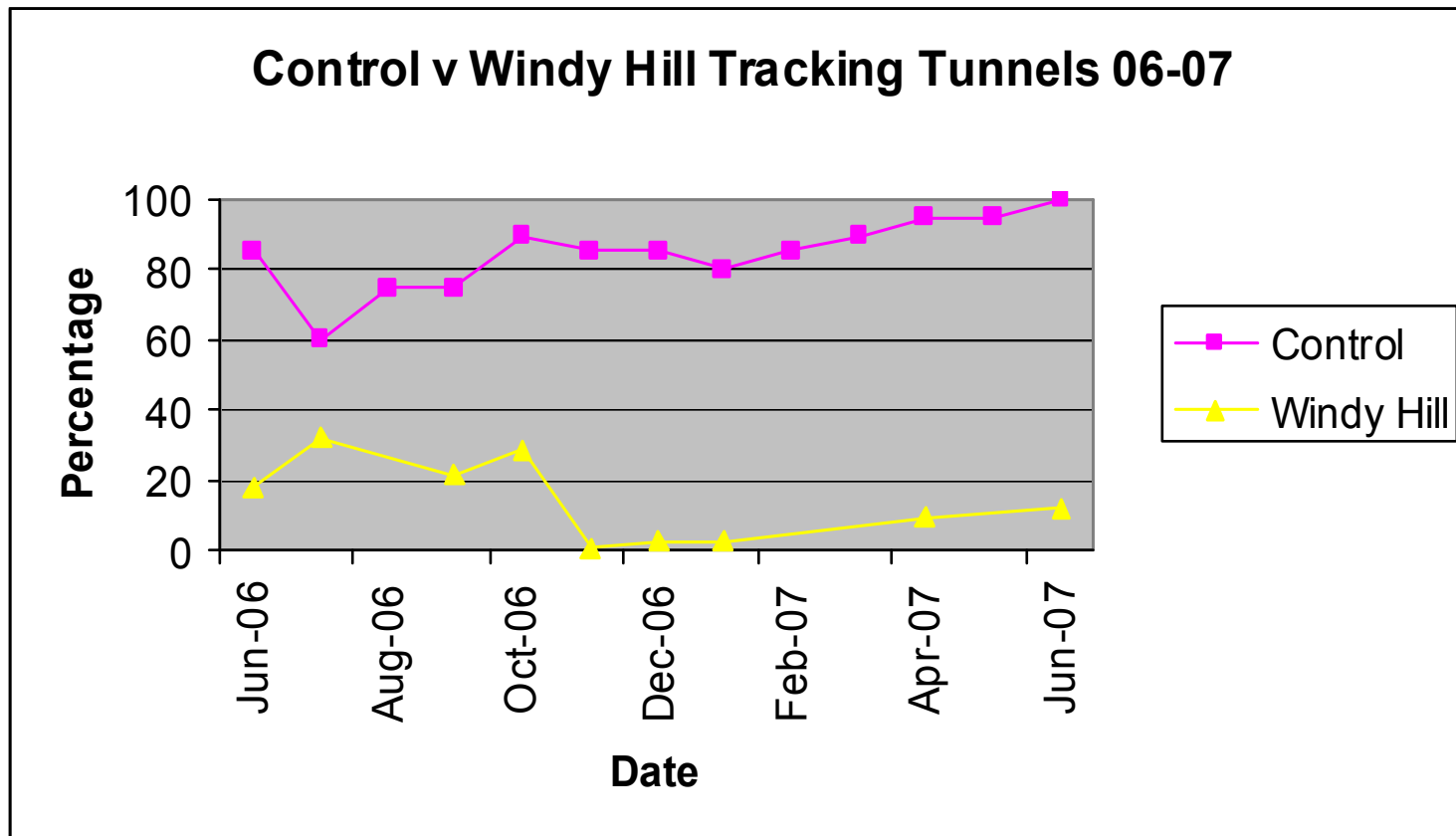
A track was established in June 2006 with 20 rat tracking tunnels, 8 bird count stations, 4 seedling plots, 10 lizard and 10 weta 'motels' or artificial covers. The monitoring of birds and seedlings was undertaken twice over the year, rats, weta and lizards monthly, in the same manner and at the same time as in the sanctuary area.

So what were the outcomes....

## Rats



The twenty rat tracking tunnels established at a minimum of 50m were baited with peanut butter and monitored overnight every month.



The average rat tracking tunnel percentage over the year at Windy Hill was 15% and 86% on the control site. Densities peaked at 100% in June in the control site.



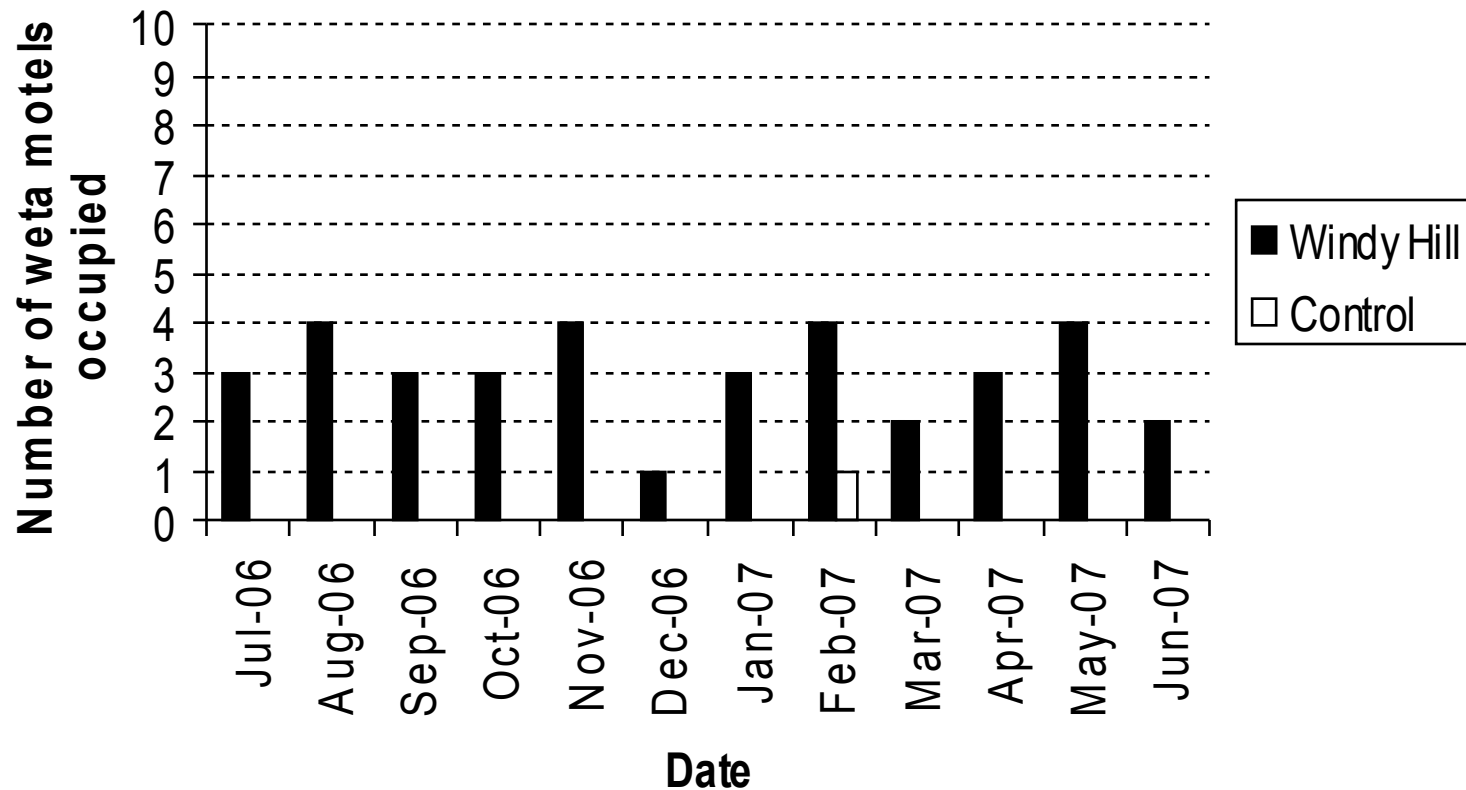
## Weta



Weta motels were made from short hollow sections of bamboo with a circumference too small for mice or rats to enter. These were fixed to trees. Each month the motels were checked for weta and a weta type, sex and number noted.



## 2006-07 Control/Windy Hill Weta Motel Occupation



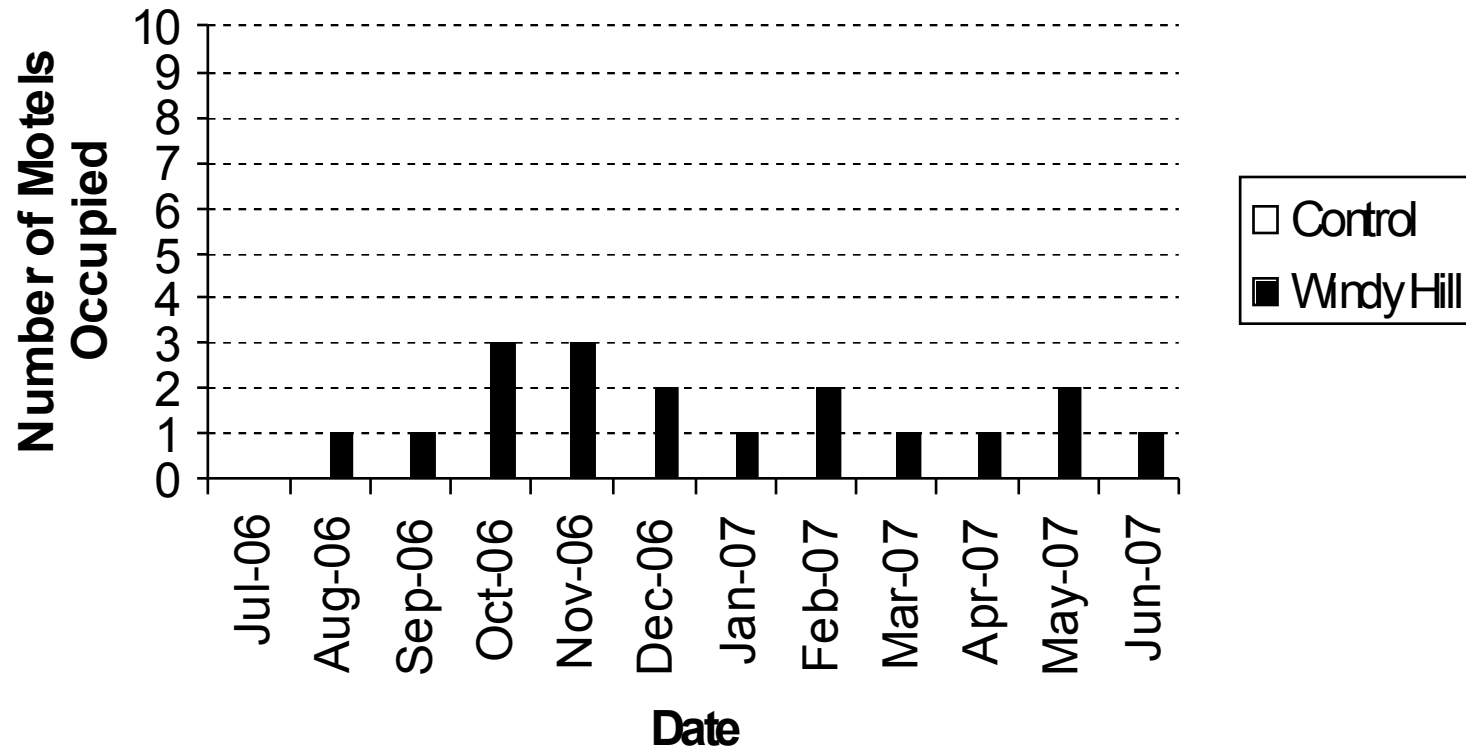
Weta moved into the weta 'motels' in the managed area within 1 month of the 'motels' being established. It was eight months before a weta was recorded in the control area and this was the only one sighted over the year. Up to 40% of the weta motels in the managed site were occupied during the year with an average of three weta in motels per month. Almost all weta were identified as tree weta.



Lizard motels consisted of 5 layers of Onduline (corrugated card) approximately 400cm square with layers separated by slithers of bamboo. They were weighted to prevent them being moved by wind. Layers were carefully lifted and skinks identified and measurement assessed. The placement of these 'motels' was supervised by Halema Jamieson from DoC.

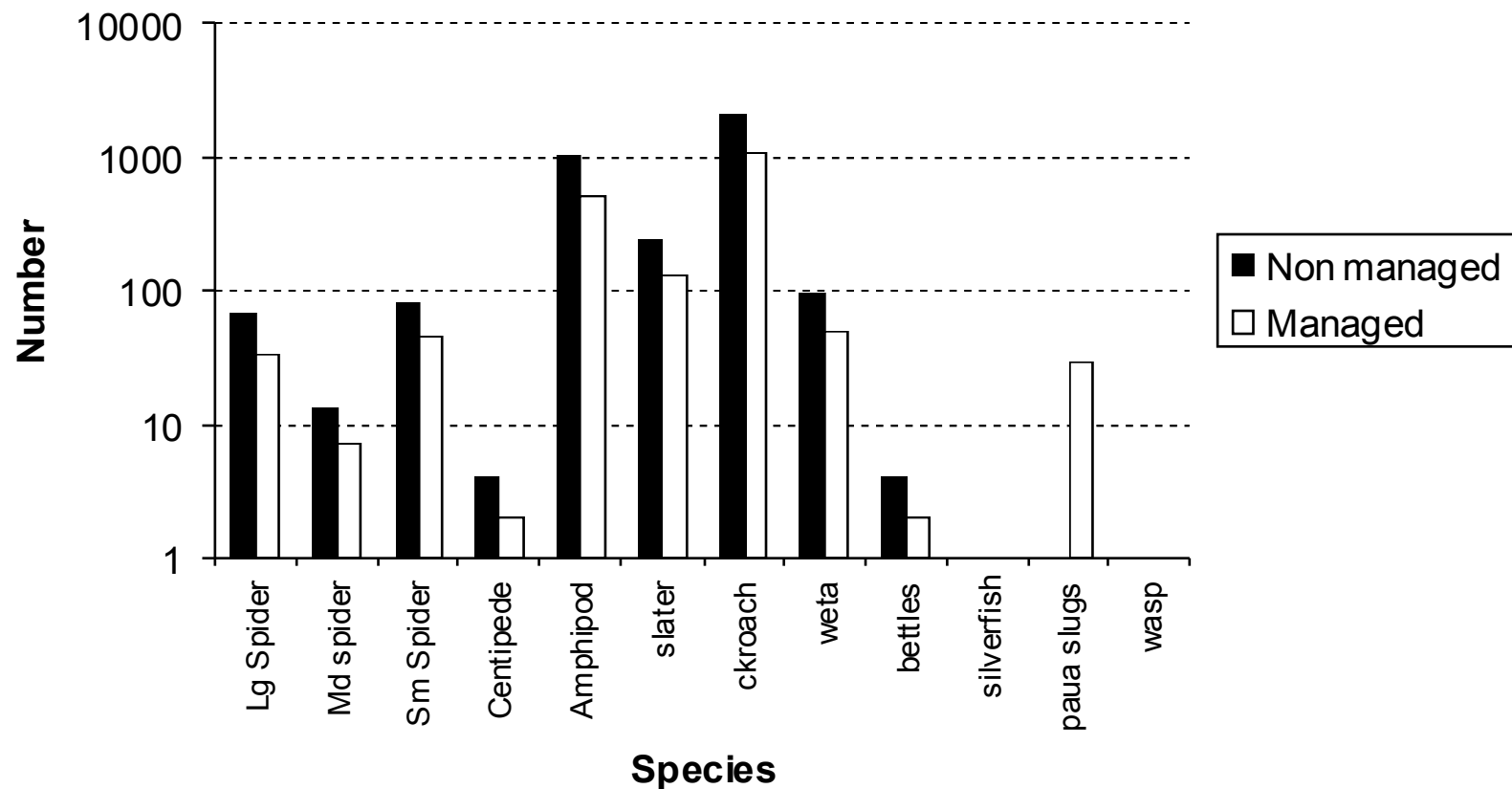


## 2006-07 Control/Windy Hill Lizard 'Motel' Occupation



No lizards were recorded in the control area at all. A total of 17 ornate skinks were recorded in the motels at Windy Hill with a maximum of 30% of motels occupied at any one time.

## Invert analysis 06-07



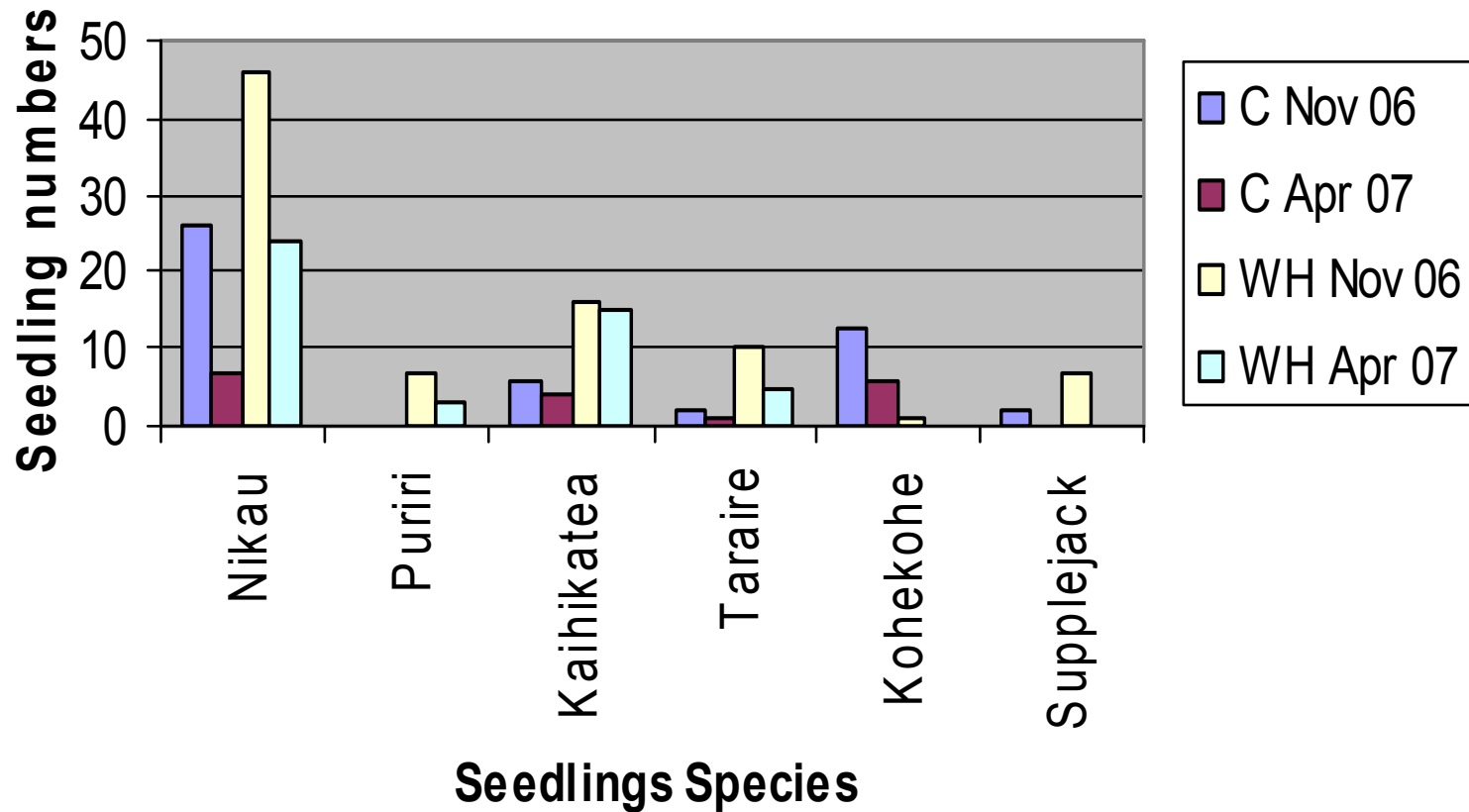
A wide range of invertebrates moved into the 'motels' shortly after they were established so it was decided to record their presence and abundance as well. While densities were slightly higher in the controlled area it there was more variety of invertebrate in the managed area – of note a number of paua slugs not common on the mainland. Invertebrates in the 'motels' in the managed area may have been subject to displacement and predation by resident lizards which may account for them being present in fewer numbers. With high densities of rats in the control area invertebrates may also have taken advantage of these rat proof 'motels'.





Seedling plots were set out in 1m square quadrats which were established randomly but adjacent to tracks for easy access with two established in mature forest and two in regenerating forest on both the control and sanctuary sites. Six indicator seedlings were monitored – nikau, taraire, kaihikatea, supple jack, kohekohe, and puriri.

## Seedling Abundance Control/WH 06-07



In November 2006 a total of 49 seedlings were recorded in the 4 plots in the Control site and 87 in the 4 plots at Windy Hill. Following a very dry summer when the count was undertaken in April 2007 both the control and the sites at Windy Hill had much reduced seedling totals – 18 in the Control site and 47 at Windy Hill. With the exception of kohekohe seedling abundance was much greater in the sanctuary site.

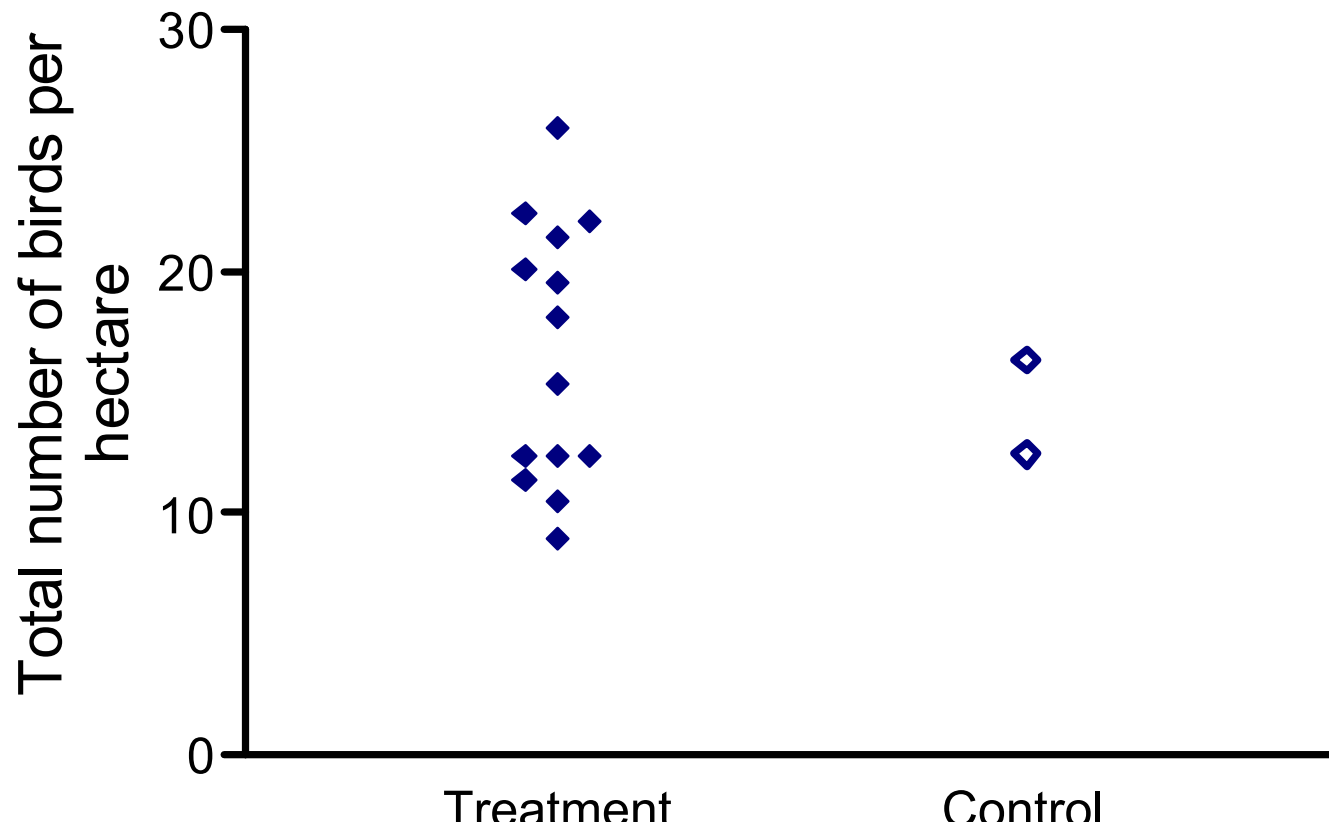


## Birds



Bird monitoring was carried out in June and December – in the control area 8 stations at 50 metre spacings on two 150 metre transects were monitored six times per count for 3 minutes. In the managed site 16 transects were monitored.

## Total number of birds in managed vs control sites



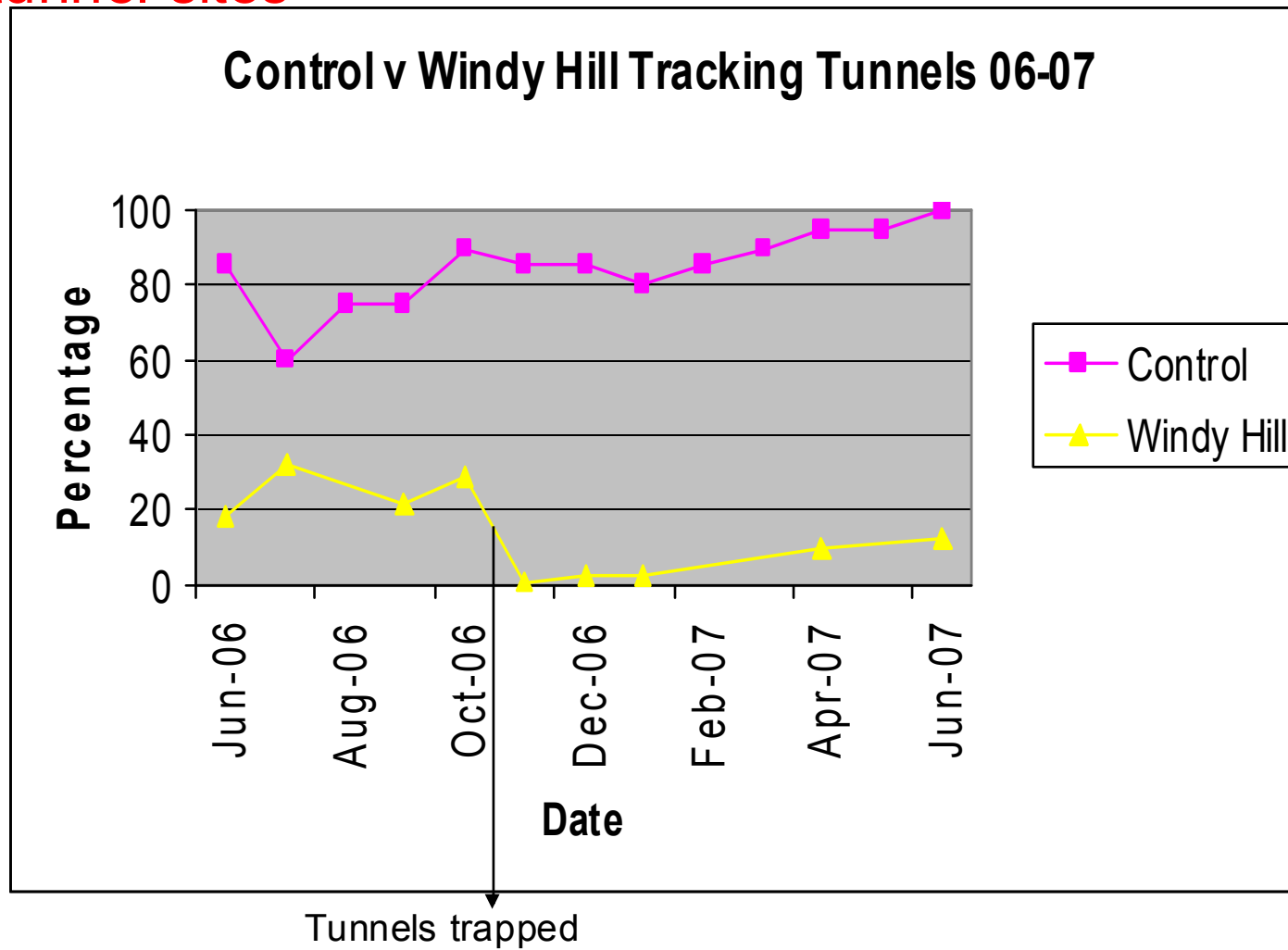
Bird monitoring in both the control and Windy Hill project areas were carried out in June 07 and Dec 06 . The December monitor showed the bird densities in the control site were at the lower end of the densities recorded at Windy Hill however the June 07 showed no significant difference. It may be that the proximity of the two sites is too close to clearly observe differences – bird numbers may be similar in the control site due to the spill over of juveniles from the managed site.



## Trialling for rats multi-tracking



## Checking for signs of rats habituating at tracking tunnel sites





Where to next ?



Keep going for another year to get more data – reduce number of times weta and lizard monitored to twice a year to reduce disturbance, compare bird monitoring from other unmanaged areas on GBIs,





Acknowledgements

DoC GBIs – Halema Jamieson

Contractor - Dean Medland

Prof John Ogden –Auckland University

Biodiversity Advice Fund

Monique Ditzhuyzen – Landowner

Little Windy Hill Company Ltd- Landowner

DoC Stewart Island – Brent Beavan