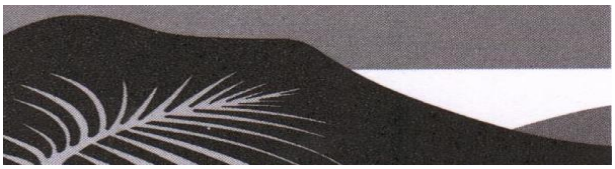
Windy Hill Rosalie Bay Catchment Trust

Twenty Years of Ecological Restoration

A review

Judy Gilbert April 2019

Windy Hill Sanctuary
429 Rosalie Bay Rd
Great Barrier Island
www.windyhillsanctuary.nz



Windy Hill Rosalie Bay Catchment Trust

20 Year Review – April 2019

Ecological restoration in the Windy Hill Rosalie Bay Catchment area has been ongoing for 20 years with active management commencing in April 1999. The current Windy Hill Sanctuary area of 770ha has developed integrated pest management, undertakes annual species monitoring, a range of citizen science projects, and has accumulated a significant bank of species data over that time.

The original objective of the 1998 Little Windy Hill Company pest management project was to improve bird abundance by suppressing pests. In early 2001, the Windy Hill Rosalie Bay Catchment Trust was formed to act as an independent body taking on the responsibility for employment, public liability insurance, ACC, and the pest management at Little Windy Hill that was already underway. The Trust also provides governance for the landowners that have joined into the Sanctuary.

The Trust expanded the early objectives of increasing bird numbers more fully onto sustaining and improving the native biodiversity of this area of Aotea Great Barrier, creating conservation based employment, and being a working model of ecological restoration on private land under the 'Sanctuary' concept. More recently the Trust has added the objectives of researching to find the most effective, cost effective, and socially acceptable method of suppressing rats at low to zero levels using a mix of low potency bait and traps.

Over 20 years the Trust has measurably achieved its objectives;

- The natural capital of the Sanctuary area has improved – the Sanctuary's and independent species monitoring indicates this area has the highest abundance of birds on the island, eleven of the fourteen known Aotea lizards are present in greater abundance than in unmanaged areas, and some invertebrates are present in higher numbers, eg; weta and paua slugs.
- Biodiversity was increased when North Island robins were translocated in 2004, 2009, and 2012 returning this species to the island after an absence of 140 years. Long term the robins did not remain at Windy Hill but birds from both Glenfern Sanctuary and Windy Hill are now established in the Hirakimata (Mt Hobson) area and appear to be self-sustaining.
  Three Chevron skinks have been released in the Sanctuary after rehabilitation at Auckland Zoo. Injured local pateke, kaka, and kereru are released here following treatment from Aotea Bird Rescue. The Sanctuary is viewed as a refuge by these organisations.
- Twenty three job opportunities have been created and many of these sustained for lengthy periods of time adding to the skill base of the island. $1.9M has been contributed to the local economy through wages. The Trust has diligently applied for funding to cover operational and capital costs with $2.8M raised since 2000 within in a competitive contestable funding environment.
- The Windy Hill Sanctuary is now well regarded throughout NZ as a model of conservation on private land :
  - In 2003 the Sanctuary received a Ministry for the Environment Green Ribbon Award for Caring for Biodiversity and an Auckland Regional Council E-Award for Caring for Land and Biodiversity.
  - In 2004 the Department of Conservation awarded the Trust the Stella Francis Award for Conservation Excellence

- 2018 the Trust won the Eradication section of the Auckland Council Mayoral Conservation Awards.
  Within the Sanctuaries of NZ movement, the Trust is referenced for the citizen science it undertakes and the value of its lengthy data set which is contributed to nationally kept data sets measuring the response of native species to reduced pest predation.

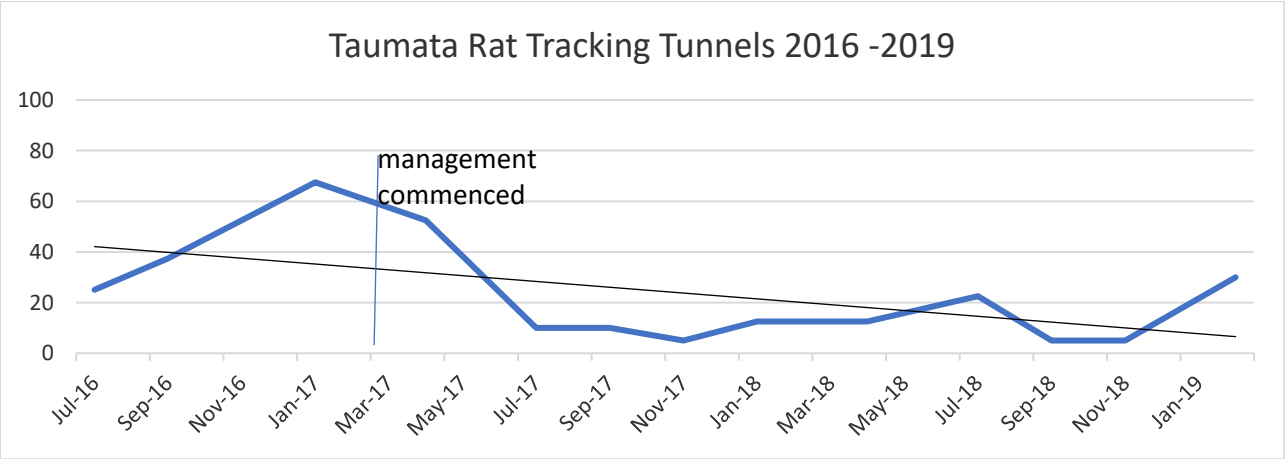
- Pest management is now carried out over 15 properties owned by 53 individual landowners indicating a positive community uptake in active conservation and a growing awareness of the need to protect biodiversity. All landowners are signed participants in a Working Agreement which sets out the responsibilities of both parties.
- Systematic integrated pest management between 1999 and end of 2018 has resulted in the culling of 54,365 rats (plus an unknown number poisoned), 366 feral cats and 127 feral pigs, over 300 feral goats before their eradication in 2004, and the suppression of myhna, magpies, and wasps. A range of invasive weeds are removed annually with over 700 radiata pines taken from two pest managed areas. Appendix 1 shows summary of all animal pests culled to date.
- Financial support of the Trust has continued to grow - the Sanctuary is sponsored to the tune of $60k per annum by donations from landowners and voluntary management and field work. It has sponsored free freight from Sealink Logistics, gps mapping, and pro bono Annual Accounts and Auditing. An education fund was established in 2016 from monthly donations from Scott Macindoe.

Pest Managed Areas

The Sanctuary now totals 770 HA divided into 5 pest managed areas that have been created by parcels of contiguous land as landowners agreed to ecological restoration on their properties. The areas developed as follows: Little Windy Hill – 1999, Benthorn Farm – 2001, Big Windy – 2006, Rosalie Bay - 2009, and Taumata – 2016.

These separate pest managed areas have been utilised to research a range of rat pest management methodologies such as trapping only, a mix of bait and traps, a range of bait types and weights, or bait only. The efficacy of all these options has been evaluated using rat tracking monitoring undertaken 5 times a year. Appendix 2 is a summary of the tracking tunnel outcomes of the range of rat pest management methods over time for each area and the more detailed record of outcomes for the Little Windy Hill pest managed area on which the summary is based is attached as Appendix 3.

The current mix of alternate traps and 100-150grams of diphacenone bait has produced good results for both the Windy Hill (2018 - 5.5% tracking tunnel (t.t) annual average) and Benthorn Bush (2018 – 8% annual average) areas. Unexpectedly, the trapping only Benthorn Paddock area is also achieving low tracking percentages with trap checks every two weeks (2018 – 9% annual average).
Rosalie Bay pest managed area benefitted from a year of placing bait in the open on tree trunks on the internal tracks, checked every three months. The surrounding perimeter track of alternate bait/trap at 12.5m spacing was checked every month. This method achieved an annual average of 2% t.t, the best achieved in any pest managed area. However, some bait was seen to be eaten by silvereyes, so it was returned to boxes in 2018 and the annual tracking tunnel average rose to 12%.
Big Windy pest managed area became the research site for the Goodnature A24 project in 2016 and over two and a half years these traps, even at reduced spacing, failed to bring the tracking tunnel below an average of 33%. It also proved more expensive to use Goodnature A 24 traps versus monthly manual trap and bait checks due to the high cost of their consumables (gas cylinders and bait). The report of this project and the cost comparison has been widely shared throughout NZ and is posted on the Sanctuary website.
Taumata pest management area is the latest area to be developed and is trialling a baiting only pulse regime undertaken three times a year. The area has no tracks or trap stations and is also trialling how cost effective this layout is. Kelvin Floyd, our GIS sponsor, mapped the layout of 25m spaced bait sites, and baits are fixed to trees as plotted. Results to date have been mixed though the t.t.trend has been downward. Annual bird monitoring indicates an increase in bird abundance in Taumata and the small sample of lizard monitoring to date indicates an increase in both variety and number.



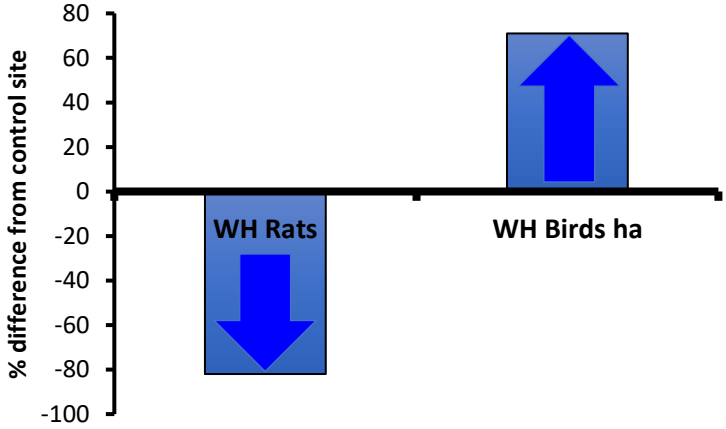
To potentially improve tracking indexes, the bait pulse timeframes have been extended to eight weeks this year, versus six weeks prior, giving animals longer to access bait.
It is difficult to assess if the management of this area is more cost effective without tracks as movement over the terrain is slower, but a plus is having bait present in the environment for less time - between 18 and 24 weeks of the year versus 52. Evaluation is ongoing as to the long term efficacy of this method.

Rat Tracking Tunnels
A comprehensive network of 210 rat tracking tunnels spread over both the Sanctuary and unmanaged Control sites has evolved. Currently, there are 6 lines of 10 tracking tunnels in Control sites (60 tunnels) and 15 lines of 10 (150 tunnels) within the Sanctuary. Tracking tunnel monitoring commenced in 2004 at Little

Windy Hill but was standardised Sanctuary wide in 2010 with monitoring undertaken 5 times a year. This has been reduced to 4 times a year from beginning 2019. While acknowledged as an unsophisticated method of measuring rat densities, when done to standard protocols over time, it has provided useful data of how effectively any methodology is working.
Tracking tunnel results for some areas indicate that rats are being suppressed to very low levels. In February 2019, they stood at 2.5% for Little Windy Hill, 5% for both Benthorn Bush and Paddock, with other areas remaining a challenge - Big Windy 15%, Rosalie Bay 20% and Taumata 30%.
Tracking tunnel data from 2010 is currently being uploaded to the trap.nz site alongside the already inserted gps position of every trap/bait and species monitoring station. The tracking tunnel data from the Sanctuary is a monitoring data pilot for trap.nz and will be used to develop more effective reporting from trap.nz for all groups registered with this organisation.

Species Monitoring
A comprehensive monitoring programme has developed since 2000 when annual bird monitoring commenced. Originally, bird monitoring was supervised and reported on by Dr Sam Ferreira with this role taken over by Trustee Prof John Ogden in 2008. The data set is one of the longest in NZ undertaken by a community group. Bird trends for the last eight years have been upward. A drop recorded in 2018 is unexplained but may be due to some seasonal influences or birds having reached carrying capacity for the area.
A field worker's self-appointed kaka nest finding dog has found 44 kaka nests over the 2018 and 2019 breeding seasons some with up to 4 chicks. These are GPS'ed and will be followed up on annually.
Three seabird surveys have been carried out using a sniffer dog. These surveys identified a sprinkling of black petrel burrows and two established nesting sites for grey faced petrel. Black Petrel nests are now GPSed and monitored annually.
Lizards, invertebrates, and weta have been monitored since 2006 and freshwater streams monitored for species presence and abundance since that time. The range of species in the freshwater streams indicates they are in good health.
A range of species monitoring reports can be accessed on the Sanctuary website.

Biodiversity and Pest species changes in Windy Hill Sanctuary relative to the Control site. Averaged over 10 years.



Overall, all monitoring clearly establishes the benefit to native species from reduced predation by rats.

Governance
The Trust is currently made up of three Trustees – Judy Gilbert (2001), John Ogden (2002), and Rose Harland (2010). Derek Bell was appointed a Trustee in April 2019. At the time the Trust was incorporated in 2001

there were 5 Trustees of which Judy Gilbert is the only one remaining. A small nimble Trust has facilitated effective management by the Sanctuary Manager holding the mandate to undertake progressive and adaptive Sanctuary management over time and meet all statutory obligations.
Sue Thompson has undertaken exemplary administration of the Trusts affairs since July 2003 and has made a key contribution to the high quality reporting to the Trust manager, Trustees, and funding organisations since that time.

Field Team
The Trust has benefitted from the long term employment of several key field team members. Dean Medland worked for the Trust in a variety of capacities from November 1999 to March 2019 – 20 years. Kevin Parsons joined the team in April 2002 and remains as Field Manager to date – 18 years. Rachel Wakefield served as a field worker for 13 years and continues to assist with bird monitoring. Henry Cookson, who started at the age of nineteen, has worked for the Trust since 2012 - 7 years. Dave Harland has worked as a field worker and a volunteer since 2006. The Trust also employs Abby Naismith and new part timer Lotte McIntyre. Having a consistent, paid field team is a huge advantage in the context of carrying out ecological restoration – it ensures that any Operational Plan is carried out fully and allows for consistency of effort and outcome over time. It has been a key factor in the success of this Sanctuary.

OSH
As for all community groups in NZ, OSH requirements have increased significantly for the Trust. Since undertaking the Southern Wharf Surveillance contract for Auckland Council in 2016, the Trust has had to upgrade its OSH policies and practices to comply for council contracts. The Trust has recently engaged a local OSH expert to improve OSH across the board and gained a high pass from the most recent PreQual audit.

Innovation and Technology
The Trust has consistently strived to be innovative in its approach and has been the first in the country to trial, test, and adopt worm farms as a means of on-site disposal of aged rat bait. The Trust has trailed a range of rat traps for efficacy and ease of use, non-toxic rodenticides, long life lures, and more recently Econode sensored rat and cat traps. The Sanctuary has the capacity to undertake sound science and is being sought out to undertake trails by the likes of Boffa Miskell.

Partnerships
Partnerships are essential for growing capacity and include:

- Funding Organisations – Lotteries Environment & Heritage, WWF – Habitat Protection Fund, DOC Community Partnerships Fund, Auckland Council Local Board and Regional Environmental Funds, Foundation North, QEII National Trust
- Ngati Rehua Ngati Wai ki Aotea Trust Board - MOU
- Glenfern Sanctuary – translocations, information sharing, combined rat tracking tunnels
- Auckland Museum – invertebrate monitoring and rare plant identification
- Auckland Council & Great Barrier Local Board – Goodnature A24 trap project & Aotea Community Native Nursery
- Landcare Research – technical data, fungal foray
- Auckland and Massey Universities – 5 Masters and 3 Doctorate students undertaken studies in the Sanctuary
- DOC – management of two DoC Conservation Park blocks, technical advice & support
- Sanctuaries of NZ – data and information sharing
- Econode – sensored product field trials
- Kelvin Floyd – mapping
- Sealink Logistics – sponsored freight

Community Communication and Social Media

The Trust has published 34 newsletters sent to more than 450 people/organisations and undertaken over 120 site presentations to community, organisations, or groups of visitors.

The Sanctuary Manager has presented the work of the Sanctuary at conferences throughout NZ and overseas.

There have been series of Workshops and Sanctuary Open Days for the community to learn about pest management and the outcomes of pest suppression.

Over 100 articles have been written for the Barrier Bulletin with the latest a series of 11 articles covering the Sanctuary's citizen science programme.

The Trust was involved in the community consultation for the Islands Ecology Vision which was completed in 2017 and has featured in several published papers.

The Great Barrier Environmental Trust works closely with Sanctuary with species data from the Sanctuary included in the Environmental Trust 2010 State of the Environment Report.

Communication with resident landowners is informal and frequent with updates of activities and monitoring shared.

The Trust plays a significant role in this community in terms of increasing peoples' understanding of, attitudes towards, and expectation of conservation.

For wider communication the Trust has a website and a Facebook page that are updated regularly. Facebook posts reach around 2000 people. This media is now required by funding organisations.

https://www.windyhillsanctuary.nz/

https://www.facebook.com/windyhillsanctuary

Work outside Sanctuary

The Trust has spread its area of influence by funding and organising research on Hochstetters Frogs in the Conservation Park Te Paparahi area. Two 10 day surveys have been completed and reports indicate stable populations at certain elevations. Two further surveys supported by DOC and Ngati Rehua are to be undertaken to gain a comprehensive understanding of the status of this species.

The Trust also funded the disease screening of Red Crown Kakariki on the Mokohinau islands in a bid to find a regional disease-free source for a potential breed and release programme of this species. Unfortunately, beak and feather disease was present in the population and the plan to establish a breeding facility in the Sanctuary was abandoned after five years of enquiry.

Since 2005, the Trust has managed under contract from Auckland Council and Auckland Transport, the biosecurity surveillance at the islands wharves, jetties, boat ramps, waste stations and the Claris airport.

The Trust has acted for many years as an umbrella group for Rat-Attack, a local pest management business, and more recently for the Aotea Community Native Plant Nursery in which it is also playing a lead establishment role.

The Trust has acted as a mentor and answered many enquiries from community about pests and their management. The Trust also sells equipment on request.

The changing conservation landscape

The government funded Predator Free NZ 2050 has brought biodiversity based pest management to the forefront in NZ and enhanced this Sanctuary's profile as a community leader. The urgency of saving NZs biodiversity is now recognised throughout rural and urban communities and the growth of suburban/rural community conservation is marked. The Sanctuaries, who are part of the 15 year old Sanctuaries of NZ movement under the leadership of Landcare Research, are now the role models for communities having already won the hearts and minds of their participants over time.

Where to from here

The vision of a pest free Aotea is still far from being a reality. This means that if the Sanctuary wishes to sustain the conservation gains of the past 20 years then pest management and species monitoring needs to

continue. Research and development in the field of vertebrate pest management is romping along under the Predator Free NZ 2050 banner and there may well be some improved tools available within the next five years making pest management potentially more efficient and more cost effective.
The Trust is currently well placed to continue to deliver both the leadership and the operational programme to sustain improved native species outcomes. The Trust Manager is also committed for a further three years.

Acknowledgements

- The Sanctuary Field Team is the engine room of this project and their dedication and commitment are integral to the success that is the Windy Hill Sanctuary. Dean Medland worked in various capacities for the Trust fo9r 18 years and built all 80km+ of trapping routes
- Our funders – Lotteries Environment & Heritage, WWF – Habitat Protection Fund, DOC Community Partnerships Fund, Auckland Council Local Board and Regional Environmental Funds, Foundation North, QEII National Trust
- Our Trustees - John Ogden has been an exemplary technical and ecological advisor to the Trust and has written a range of reports based on Sanctuary monitoring on the outcomes for native species. He has brought a tangible level of credibility to the Sanctuary, and his encouragement and guidance is highly appreciated. Rose Harland is a staunch supporter of the Sanctuary and actively participates in community conversations about the value of conservation.
- Administration - Sue Thompson has made an outstanding contribution to the Trust administration and her unwavering support is highly valued by the Trust Manager.
- Landowners -the 53 landowners who have placed the responsibility for the ecological restoration of their properties with the Trust.

Also, to be acknowledged:
John Phibbs – pro bono annual accounts
Mike Parsons – pro bono annual account audit
Kelvin Floyd – mapping and gps training
Sealink Logistics – sponsored freight
Living Simply – discounted field team wear

The substantial support and trust in my capacity to manage this runaway project is much appreciated.
I am delighted with the outcome of 20 years at the conservation coalface.

Judy Gilbert
Volunteer Trust Manager

Appendix 1 – Total Catch Data

				1999 -2018			
	Rats/Mice	**Cats**	**Pigs***	**Goats**	**Magpies***	**Wasps**	**Rabbits***
1999	649	5	8	69			
2000	735	16		113	14		
2001	1665	19	3	61	7		
2002	3581	30	4	58			
2003	3222	32	1				
2004	3947	32		Eradicated			
2005	3105	27			5		
2006	6950	22					5
2007	3359	8	3				4
2008	2777	11	32			1	7
2009	197	9	13				9
2010	524	10	8				12
2011	3144	10	5			6	16
2012	2859	33	8			4	10
2013	2649	21	7			13	15
2014	2525	18	7			37	22
2015	3127	12	6			2	7
2016	3795	20	6			15	53
2017	2543	12	14			2	28
2018	3012	18	12			12	20
	54365	**365**	**137**	**301**	**26**	**91**	**208**

* where records kept

APPENDIX 2

Development of Pest Management Programme and Tracking Tunnel Outcomes

Overview at end 2018

5500 stations, alternating traps and baits.

Spacing of stations – on perimeter tracks 12.5m, on internal tracks 25m

Key – Pest management areas within Sanctuary

LWH Little Windy Hill	**BH** Benthorn Bush	**BW** Big Windy	**RB** Rosalie Bay	**TAU** Taumata	**Contr** Control (unmanaged)

Date	Management	TT % annual average						Events
		LWH	**BH**	**BW**	**RB**	**TAU**	**Contr**	
1999-2004	Trapping Only	39.5						
2005	Trapping with 2 x 1 week pulses cholecalciferol Strikers	42.5	38					
2006	Trapping with 2 x 3 week pulses cholecalciferol Strikers	15.8	49				79.2	
2007	Trapping with 2 x 6 week pulses cholecalciferol Strikers	8.2	10.4	9.6			91.2	Huge storms
2008	Trapping with 2 x 6 week pulses cholecalciferol Strikers	15.2	15.2	8.4			82.5	
2009	Brodifacoum	11	9.4	17.6			48.3	
2010	Brodifacoum	14	7.4	9.8	8.8		76	Drought
2011	Trapping 50% & 50% 150gram Diphacenone Feb-May 2 x 20R brodifacoum perimeter track only	8.5	8	8	22		56	
2012	Trapping 50% & 50% 100gram Diphacenone Feb-May 2 x 20R brodifacoum perimeter track only	15	8	16	28*		88	
2013	Trapping 50% & 50% 50gram Diphacenone Feb-May 2 x 20R brodifacoum perimeter track only	6.5	5	16*	10		62	Drought
2014	Trapping 50% & 50% 50gram Diphacenone Change Aug 2014 to Trapping 50% & 20gram Cholecalciferol	13	9	20	16		54	
2015	Trapping 50% & 20gram Cholecalciferol LWH trapping 50% and 50gram Diphacenone Oct, Nov - BW, RB tree baits	9.5	5	22	14		52	
2016	LWH - Trapping 50% & 50 grams diphacenone BH - Trapping 50% & 20gram Cholecalciferol RB – Perimeter 50% traps & 100grams diphacenone in trees. Internal 100% 100grams diphacenone in trees. BW – Goodnature traps 50x100m spacing	9	11	26.4	12		54	Wet summer > high food abundance

Date	Management	LWH	BH	BW	RB	TAU	Contr	Events
2017	LWH - Trapping 50% & 100 grams diphacenone BH - Trapping 50% & 100 grams diphacenone RB – Perimeter 50% traps & 100grams diphacenone in trees. Internal 100% 100grams diphacenone in trees. BW – Goodnature traps 25x100m spacing TAU – 150gram diphacenone in trees. 3 pulses	7.5	5	31	2	Nov 5	43	Warm winter, wetter than normal summer
2018	LWH - Trapping 50% & 150 grams diphacenone- tree baits May – Sept BH - Trapping 50% & 150 grams diphacenone RB – Perimeter 50% traps & 500grams diphacenone in trees. Internal 100% 150grams diphacenone in trees. BW – Goodnature traps 25x100m spacing to Aug 2018. Sept - Trapping 50% & 150 grams diphacenone TAU – 150gram diphacenone in trees. 3 pulses	5.5	8	11.5	12	11.5	55	Warm winter, wetter than normal summer

* Remained in brodi thru 2012

* I month pulse brodi to bring rats down

APPENDIX 3

Little Windy Hill

	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004
Jan/Feb	7.5	12.5	0	12.5	15	5	20	5	9	18	16	3	15	48	
April	12.5	12.5	12.5	12.5	25	15	15	7.5	25	23	13	10	25	73	30
July	7.5	0	15	12.5	2.5	5	10	10	19	3	9	12	18		
Sept	0	2.5	15	2.5	10	5	15	7.5	12	7	18	9	20	24	48
Nov	0	10	2.5	7.5	12.5	2.5	15	12.5	6	4	20	7	1	25	
Annual Total	27.5	37.5	45	47.5	65	32.5	75	42.5	71	55	76	41	79	170	
Annual Average %	5.5	7.5	9	9.5	13	6.5	15	8.5	14	11	15.2	8.2	15.8	42.5	40

Trapping only

Trapping and 2 x 3 weekly pulses of cholecalciferol bait in trees

Trapping and 2 x 6 weekly pulses of cholecalciferol bait in trees

Brodifacoum NO traps

Traps 50% and 50% diphacenone 150grams

Traps 50% and 50% diphacenone 100grams

Traps 50% and 50% diphacenone 50 grams

Traps 50% and 50% cholecalciferol 50 grams