

Kohi Point Scenic Reserve

Bait Station Operation 2009



Bay of Plenty Regional Council
Operations Publication 2010/04
September 2010

5 Quay Street
P O Box 364
Whakatane
NEW ZEALAND

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*Working with our communities for a better environment
E mahi ngatahi e pai ake ai te taiao*





Kohi Point

Scenic Reserve

Bait station operation

2009

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Whakatane 3158
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Wayne Okeefe and David Paine

Acknowledgements

This project is a great example of inter-organisational cooperation. The goodwill shown by all parties recognises the value of this project to the community not only for the benefits to the land and its inhabitants but for the health and well being of the people who choose to visit and engage. Merely knowing this land is being restored, pests managed and species protected and enhanced is a measurable and valuable public good not only bestowed upon the people of Whakatāne but all of New Zealand. The outcomes of this project particularly the strong kiwi population could not be achieved without cooperation of all partners.

Whakatāne District Council have shown strong commitment to this opportunity to apply sound biodiversity management to their reserves in difficult financial times. I thank them for their conviction and commitment to this work.

Te Runanga o Ngāti Awa have also always shown strong commitment to restoring the land and for making this project happen in various forums. I thank them for the commitment.

Department of Conservation management and field staff have risen to this challenge also in difficult times and are here recognised for their seizing of an opportunity worthy of support both for its value to fauna and flora and to the community.

Whakatāne Kiwi Trust as community representatives, have also shown vision and courage rising to the challenge to meet the future needs of this project and take it to the wider even global community. The trustees are commended for their hard work.

Bay of Plenty Regional Council councillors and staff are commended also for their philosophical insight and financial support for this work which could not proceed otherwise.

Executive summary

On the Kohi Point Scenic Reserve (KPSR) control of possums and rats was successfully carried out during September through November 2009 using two toxins placed simultaneously in bait stations on an intensive bait station network over 186ha.

The toxins used were; Pindone pellets (0.5g/kg) and Feratox (475g/kg) encapsulated cyanide.

All bait stations were fully loaded once with 1.5 kg of Pindone and five Feratox capsules.

At KPSR 20.2 % (78/386) of stations required a second feed of 750 gm. This was largely due to higher than desirable possum numbers.

The year of 2009, was an initial control operation on a naive possum and rat population. Kohi Point Scenic Reserve has a history of possum management initially through an Environmental Enhancement Fund (EEF) project since 2002 - 2004 but no targeted rat control before 2009.

Possum densities were assessed in June 2009 at 6.7% RTCI pre initial control and 1.1% post control 2009 (measured in March 2010). This indicates that possum density was successfully reduced by the 2009 operation. Care must be taken in interpreting this data as it is likely to be an underestimate due to use of raised sets to protect kiwi and due to small sample size. However we did count 202 possum carcasses at stations in 2009. (~1.08 possums killed / ha treated)

Rats were reduced from 28% TI with average of 24% high use to 2 % TI (5 lines x 10 cards). One rat tracked on 50 cards!

The operation is based on ground based bait stations laid out at ~1.8-2.0 bait stations per ha. Bait was left in the field for a minimum of six weeks before complete removal. This was sufficient to retard rodent re-population for a further ~16 weeks until February 2010 when densities would probably have risen above 10% tracking index.

Rat densities had returned to above pre control levels at the May 2010 monitor when they rebounded to 44%TI with 12.1% high use which is moderate to high. The high bait consumption is probably a factor of both rat numbers and the residual possum population.

We would hope possums are reduced sufficiently to not significantly effect the 2010 operation.

There are many variables acting on rat populations and we believe effort should be expended to consider alternative baiting strategies that will extend the protection period. We think this should be achievable while low possum density remains at the site. We would hope to remain within the current cost.

Our preferred programme alteration is to deliver an initial feed of 500 gm with 2 x Feratox cyanide followed by a second fresh feed of 250 gm Pindone at time of bait removal. Removal of cyanide contaminated bait before school holidays is a requirement of the medical officer of health.

Site statistics for Kohi Point Scenic Reserve 2009

Site	Total Pindone delivered kg	Total Pindone consumed kg	Total consumption Kg/ha	Total Feratox delivered	Known Possum kills	Kills / ha found
Kohi Pt (186ha)	637.5	385.8	2.07	2164	202	1.08

Department of Conservation standards for ground based rodent control operations have been changed since this operation to more readily accommodate this control methodology. (The same standards applicable to pest control on DOC land are applied to Kohi Point Scenic Reserve).

The condition relating to possums being below 5% RTCI has changed to being “at very low abundance, controlled simultaneously or excluded from bait stations.”

Contract delivery was carried out through Whakatane District Council (Reserves Advisor Peter McLaren. Peter was able to contract Wayne O’Keefe of Ōpōtiki to deliver works on WDC land. Bruce Bancroft provided on ground advice and audit of contractors. David Paine from Bay of Plenty Regional Council provided coordination and advice.

This report should be read in conjunction with the 2009 post control reports for Ōhope Scenic Reserve and Ngati Awa Farm Kawenata.

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Part 1: Introduction

The purpose of this report is to provide details of the 2009 bait station operation on the Kohi Point Scenic Reserve using a combination of Pindone cereal bait and Feratox encapsulated cyanide in the simultaneous control of possums and rats.

Possums and ship rats are undoubtedly the most destructive predators inhabiting our forests. The ship rat's ability to quickly reproduce, repopulate and re-establish over wide areas after control makes it a formidable and expensive pest to control particularly with ground based operations.

The operational philosophy follows the basic principles of pest control by ensuring very high percentages of target pest populations are put at mortal risk simultaneously with sufficient highly palatable bait to kill them all when they are most hungry and to have some bait over. Residual bait is then removed from all bait stations.

This baiting regime has proved effective at managing possum and rat populations in the Manawahe Ecological Corridor to low levels over five years with no sign of reduced effectiveness through bait shyness or aversion.

Part 2: Operation design

At Kohi Point Scenic Reserve (total 186 ha) 386 large Philproof bait stations have been established in contiguous bush at a pre-planned grid of ~75 m x ~75 m. Pre-planning of bait stations was carried out using Arc 9 software to determine optimum bait station distribution. Location points were then loaded into a Garmin Map 60 CSX handheld GPS and delivered to the field. Placement was on best site within 5.0 m of the pre-planned location. All tracks were marked with pink track markers and tracks cut with minimum vegetation disturbance required to see two consecutive markers in either direction.

Bait stations are set at ~ 100 mm above ground.

Pre-bagged Pindone pellets (1500 gm) were loaded into bait stations with five Feratox capsules. This amount was chosen because there was some risk that the possum numbers could have affected bait availability to rats. This was an initial control knockdown with pre control residual trap catch index (RTCI raised sets) was 6.7% and the rat index at 28%. Feratox is placed at the front of the station before refitting the floor. Follow up or top up baiting is carried out if need is determined by a wide spread 10% bait station monitor.

Extra bait was required at 78/386 stations.

Typically in these operations rats are largely undetectable through most of the summer. Rarely are second fills required for maintenance operations, possum density typically remains sufficiently low that bait delivery volumes can be further reduced (with courage) to minimise left over bait removed from the stations. The benefit is less bait wastage, less bait delivered to the field, minimised labour costs.

All surplus bait is removed from stations and buried on site after a minimum of six weeks in the field and a post control rodent monitor confirms success.

Consultation and consents were jointly managed by Peter McLaren and David Paine.

Ron Russell undertook door to door consultation with immediate neighbours to secure permission to apply cyanide within 150 m of dwellings on the Whakatane escarpment. All residents were supportive however concern was raised that unsupervised kids may have access and extra leaflets were delivered and high risk bait stations were cleared of Vertebrate Toxic Agents (VTA).

Part 3: Outcome and Operational monitoring

Outcome monitoring is the measurement of change in particular ecological assets as a result of management over time.

Operational monitoring is the measurement of the effectiveness, success or otherwise of management operations.

3.1 Outcome monitoring

No outcome monitoring is carried out on Kohi Point Scenic Reserve beyond kiwi chick survival. An assessment of the relative importance of vegetation monitoring at this site with regard to the need to establish a programme will be made in the coming year. The vegetation of Kohi Point Scenic Reserve is the most recent of all the three reserves in the vicinity and was in early reversion from pasture in 1944. Most of the reserve is in a state of continuous successional change.

3.2 Operational monitoring

Possoms were monitored according to the national protocol, pre and post operation using 3 x 10 trap lines on raised sets due to kiwi presence.

Rodents were monitored pre and post operation using 5 x 10 tracking tunnel lines semi randomly located. Tunnels were baited with peanut butter placed on the centre of the cards and set out for one fine night. A further monitor occurred during June to assess population recovery. By May 2010 rat tracking had returned to 44% with 12% high use.

The monitoring data would have benefited from a further monitor during March to better identify the length of the protected period.

3.3 Pest animal targets

To reduce the rodent population to <5% TI and maintain possums at <5% RTCI.

3.4 Results by target

- (i) The possum control target is maintained at < 5% RTCI.

The 2009 possum result at Kohi Point Scenic Reserve was 1.1% RTCI.

(That is one possum captured in 90 trap nights off three lines of 10 traps using raised sets).

- (ii) Rats are reduced to <5% TI.

Rats were reduced from 28% with 24% high use to 2.0% TI over five lines of 10 tunnels. This is a very good result but typical of this methodology.

3.5 **Comment**

Clearly the possum target has been exceeded easily. It is proposed that this target be reduced to 2% RTCI in future operations to recognise the underestimated result given by raised sets and to ensure that possum densities do not rise to levels where they will effect rodent bait consumption. (An RTCI of 2% will allow for one possum to be caught over 60 trap nights.) Critically this will help managers to minimise rodent control bait volumes delivered into the environment with very high confidence.

Typically during these operations rats are largely undetectable through remaining spring and most of the summer. This summer was very long and dry extending well into April with a mild autumn without significant rain until late May/June. This may well have allowed two full breeding cycles and high survival rate within litters supported by very heavy fruiting from drought stressed vegetation.

Indeed anecdotal evidence from some sites (Awakeri Scenic Reserve) suggested some drought induced vegetation die off occurred through this period. (Damien Jones pers. comms.)

All surplus bait was removed from stations and buried on site after six weeks in the field and a post control rodent monitor had confirmed success.

3.6 **Proposed alteration to current method**

Rodent indices have risen sharply at this site from being 2.0% directly post control to 44% in May 2010. Many variables affect breeding rate of rats.

Some examples:

- (i) Low stocking rates on nearby pasture. This could lead to rank seeded grass with increased grass seed as an extra food supply and support breeding in fragmented bush/pasture environments leading to rapid reinvasion.
- (ii) Ecosystem suppression with whiplash effect. Removing large numbers of rodents and possums for a period of time when forest growth is very productive and vigorous creates an abundant food source easily accessible and supporting accelerating breeding in rodent survivorship.
- (iii) Extra fruiting effect. Caused from extra seeding due to drought stressed vegetation producing extra heavy flowering, extra food available to breeding rodents.
- (iv) Additional food supply from elevated invertebrate hatchings. Possibly as a result of increased egg laying in cicada populations seven years previous.
- (v) A combination of these.

We have experienced in previous years at other sites where rodent indices have remained low well into autumn and so allowed lower indices at the start of operations. Intuitively this must have beneficial effects on both the ecosystem and potentially on operational costs.

Alterations to management could be focussed either around timing of operations bringing forward, starting earlier as suggested by (Paul Jansen pers. comms).

I am not convinced this is relevant because we can always achieve a state of undetectable rats after an operation.

The other option is to extend the effective baiting period with a product able to withstand several months of weathering yet be available and attractive to rodents but also remain compliant with consents.

The first option is problematic with school holidays and the use of cyanide and also does not recognise that rats are undetectable at the end of our operations.

The second is unfettered by public health consent concerns as Pindone is a non controlled VTA and could be placed as the cyanide laden bait is removed thus eliminating any major labour cost increase. Conversely if the bait deteriorated to unpalatable well before the following year's operation it may be wise to remove it in a separate operation.

Benefits

- Potentially 2-3 extra rat free months.
- Potentially 2-3 extra successful nesting's and clutches.
- Potentially better adult survival in winter leading to stronger breeding success fatter chicks going in to winter stronger in next breeding season.
- Likely reduced bait volume delivery and therefore reduced labour cost of next years operation.

Costs

- Potential extra labour round

3.7 Timeline

Date task carried out	Task
21/6- 24/6/09	Pre assessment – possums 2009
14/09/09	Pre assessment – rats
12/10/09	Bait lay – one
22/10/09	Bait monitor
30/10/09	Bait lay two – top up 78 bait stations
24/11/09	Bait removed
16/11/09	Post monitor – rats

3.8 Costs

The total cost of Kohi Point Scenic Reserve possum and rat control operation for 2010 was \$20105.00 spread over 186 ha effective treatment. This equates to \$108.91/ ha. This cost includes all control materials, contract labour to deliver and remove bait, and operational monitoring of both possum and rat control effectiveness. No overhead costs are recorded.

Part 4: Discussion

For single visit bait delivery the maximum bait quantity to be delivered for a successful single feed each operation is $\leq 1.5\text{kg}$ being the full capacity of a large Philproof station. Any quantity less than this brings efficiencies in material cost and reduced labour. We accept that in higher possum densities (initial control or adjacent to untreated areas) there may be greater bait consumption and that this may necessitate a complete or partial top-up of stations to ensure sufficient bait to kill rodents.

In our experience a complete fill and top-up with Pindone and Feratox is only required for initial control operations or adjacent to untreated areas. This method gives good possum control with very little extra effort and cost.

Potential to reduce bait delivery volumes is demonstrated further at Ohope Scenic Reserve and Ngati Awa last year where with low possum density but high rat density, resulted in $<0.25\text{ kg}$ of bait being consumed on average at each station. At Kohi Point higher possum density resulted in $\sim 2.0\text{kg}$ consumed per hectare.

For sustained control (maintenance) operations we regularly have applied 750 gm per station and always achieve $<5\%$ TI. (During 2008 control season over 2500 ha we tracked two rats on over 410 cards.)

Now with greater experience we believe 500 gm with two Feratox would be sufficient to give a good result and have plenty left over at sites with low possum numbers well separated from untreated areas.

A “good” operation will give about three months of low rodent numbers however the longer the controlled period, the lower the following year’s rodent pre-control densities should be. We have high confidence in our monitoring programme sample size but feel a fourth monitor should be used to show rodent recovery after summer and to help us understand the build up curve.

Part 5: Conclusions

- Excellent possum and rat control has been achieved with Pindone bait delivered with Feratox for possum control at this site.
- Operational monitoring is being used to back up decisions and tweak the method.
- Managers continuously review methods.
- Minimising possum density helps to reduce volumes of pesticide delivered to the environment.
- Managers recognise the need to seek improved cost effectiveness along with improved operational effectiveness.
- Good pre-control rodent and possum monitoring data can be used to reduce bait delivery volumes.

Recommendations

- The current method is retained and tweaked continuously for improved pest control target effectiveness using a “research by management” approach. Bait volumes are to be reduced and delivered more effectively where possible.
- The possum control target is reduced to 2% to reflect the need to ensure possums have no detectable effect on rodent baits and to negate the imprecise trap catch value of raised set monitoring.
- The rodent monitoring program is strengthened to provide better data on which to make management decisions. (four monitors per annum).

Appendices

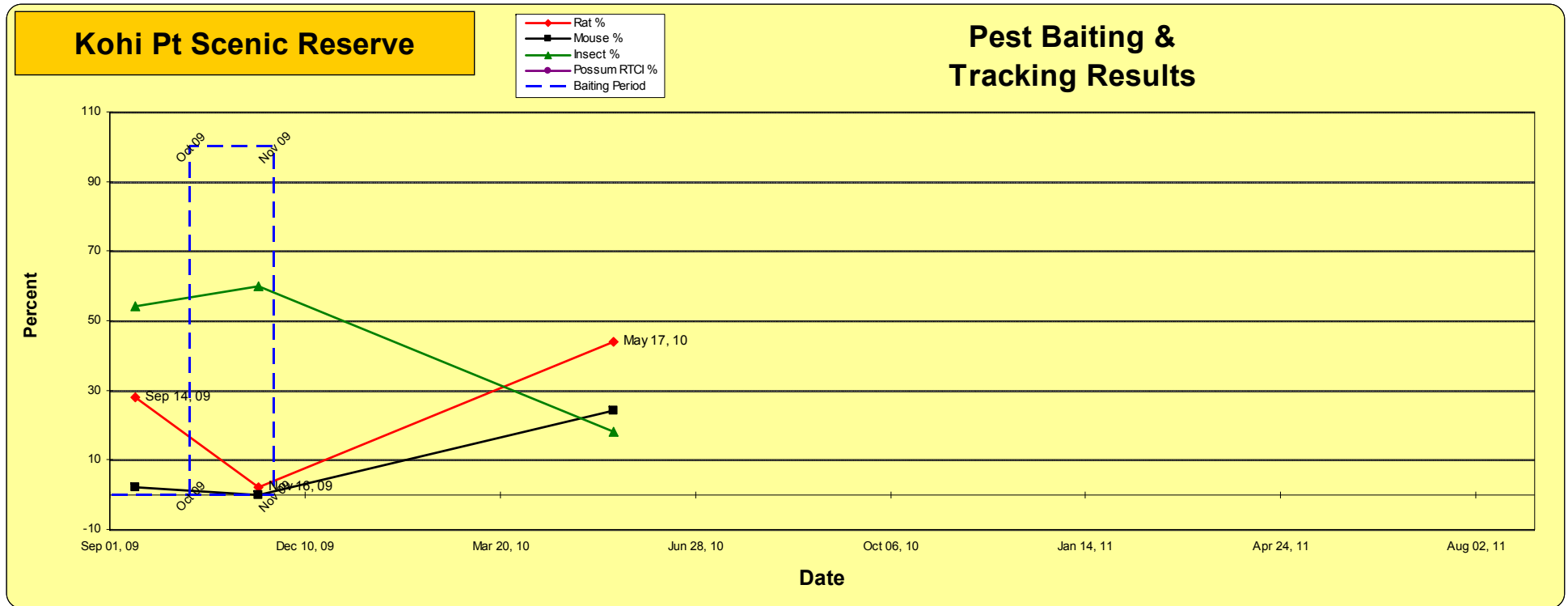
Appendix 1 – Kohi Point Scenic Reserve pre assessment rodent data

Error! Objects cannot be created from editing field codes.

Appendix 2 – Kohi Point Scenic Reserve post control rodent data

Error! Objects cannot be created from editing field codes.

Appendix 3 – Rodent tracking data and graph KP Scenic Reserve



Appendix 4 – Bait stations refilled

Kohi Pt Scenic Reserve - Bait Stations Refilled (750g)																						
Totals	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	grams
BS	0	21750	3750	2250	6000	3000	5250	0	0	2250	1500	0	2250	9000	750	0	0	1500	0	0	0	59250
1			1		1	1																1
2			1	1		1									1							2
3		1		1														1				3
4			1																			4
5		1		1																		5
6		1																1				6
7		1																				7
8		1					1															8
9													1									9
10			1							1			1									10
11		1								1			1									11
12			1			1							1									12
13						1							1									13
14						1							1									14
15		1								1												15
16																						16
17																						17
18																						18
19		1																				19
20		1																				20
21		1			1		1															21
22		1			1		1															22
23					1		1															23
24					1		1															24
25		1			1		1															25
26					1		1															26
27		1			1		1															27
28					1		1															28
29		1																				29
30		1																				30
31		1																				31
32		1									1											32
33		1									1											33
34		1																				34
35		1																				35
36		1																				36
36A		1																				36A
37		1																				37
38		1																				38
39		1																				39
40		1																				40
41		1																				41
42		1																				42
43		1																				43

Appendix 5 – Bait removed

Kohi Point Scenic Reserve - Bait Removed from Bait Stations (grams)																							
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U		
Totals	26475	30175	7550	4100	13250	12700	9450	11650	9875	17500	18700	10550	7150	3700	16200	7700	24275	6450	9250	3750	1250	251700	grams
BS	25	44	18	13	28	26	24	15	9	21	34	16	11	13	25	10	28	7	10	6	3	386	BS
1	1000	1200	250	500	250	500	250	1000	1425	500	500	1000	750	250	1000	1000	1000	1000	1200	250	500	1	
2	1200	1350	500	500	100	500	100	750	1200	1000	250	500	1000	250	500	750	1425	1000	1000	500	250	2	
3	1000	750	750	250	500	1000	1000	1200	1200	1000	750	1000	750	500	500	1200	1200	750	1350	1000	500	3	
4	1350	1000	500	100	500	750	750	1000	1350	1200	250	750	500	250	500	1000	1200	1000	1200	750		4	
5	1000	500	1200	0	0	500	1000	500	1000	750	0	250	500	500	750	500	750	1200	750	1000		5	
6	1350	750	500	0	250	750	1000	1000	1200	750	500	250	250	100	1000	500	750	500	500	250		6	
7	1200	250	0	500	1000	1000	500	750	750	500	250	100	1200	250	750	1000	500	1000	750			7	
8	1200	500	750	250	1200	250	250	750	1000	1200	0	750	1200	100	500	250	500		500			8	
9	1000	1200	1000	500	750	250	250	250	750	1000	500	1200	250	500	1000	500	1000		1000			9	
10	750	1000	250	250	1000	0	750	0		750	0	1000	250	500	1000	1000	750		1000			10	
11	1200	750	0	0	750	100	250	500		500	750	750	500	250	1200		750					11	
12	1425	1425	250	750	250	500	0	750		1200	1000	750		0	750		1000					12	
13	1500	1000	250	500	500	100	0	1200		1200	100	1000		250	500		1350					13	
14	1500	1000	500		250	250	500	1000		750	250	500			750		1000					14	
15	1200	500	0		1000	500	250	1000		250	500	250			250		500					15	
16	1000	750	100		500	500	0			1000	1200	500			500		500					16	
17	1000	1200	500		750	0	500			1000	750				1000		250					17	
18	1350	1200	250		750	250	500			1200	250				1000		1000					18	
19	750	250			250	750	750			500	750				750		1000					19	
20	1000	500			100	250	0			500	1000				500		1000					20	
21	750	100			250	500	250			750	1000				250		750					21	
22	500	250			100	1000	100				750				250		250					22	
23	500	750			500	500	0				250				500		500					23	
24	1000	1000			250	500	500				1000				250		750					24	
25	750	500			500	1000					1200				250		1200					25	
26		1200			0	500					1200						1200					26	
27		500			500						500						1000					27	
28		1200			500						1000						1200					28	
29		500									250											29	
30		500									500											30	
31		500									500											31	
32		250									250											32	
33		500									250											33	
34		100									500											34	
35		500																				35	
36		750																				36	
36A		250																				36A	
Pindone Bait Consumed			Pindone Put Out					Feratox Put Out			36A												
37	500	Bait Stations Filled		Kgs	Totals (kgs)		Bait Stations		Feratox	Tot	37												
38	750	Fill 1	12-Oct-09	386	1.5	579	Fill 1	386	5	1930	38												
39	500	Fill 2	30-Oct-09	79	0.75	59.25	Fill 2	79	3	237	39												
40	500	Total Pindone Put Out			638.25		Total Feratox put out			2167	40												
41	250	Remv	24-Nov-09	Total Removed from BS		251.7					41												
42	750	Total Consumed				386.6						42											
43	500	Possum Bodies at Bait Station sites				202						43											

Appendix 6 – Possum bodies found

Kohi Pt Scenic Reserve - Possum Bodies Found at Bait Station Sites 2009																							
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	Totals	
Totals	6	50	7	7	19	11	8	3	0	8	16	8	4	26	7	4	5	3	2	5	3	Possums	202
BS	5	25	6	3	12	7	6	2	0	4	9	4	2	10	5	3	4	2	1	2	1	BS	113
1			1											2						3		1	
2					1		1							3	2							2	
3		2																2				3	
4			2											5				2				4	
5		1		2	2	1		1			2	2					1					5	
6		1		3	1							1	2			1		1				6	
7		2								2		3		1					2			7	
8						2					2					2						8	
9						1							2	2								9	
10	1							2						5								10	
11		1		2						1	3			1								11	
12					1		2			2				3								12	
13			1			3	1				1			2								13	
14					2	1																14	
15			1							3												15	
16			1									2								1		16	
17						2														1	1	17	
18											1									2		18	
19	1	2			1																	19	
20						1		2														20	
21		1			2		1															21	
22	1	2			3											2						22	
23	2				1		1				2											23	
24	1				1																	24	
25		3																				25	
26					3												1					26	
27		1			1																	27	
28																						28	
29		2									1											29	
30		1																				30	
31		4																				31	
32																						32	
33		2									3											33	
34		1									1											34	
35		5																				35	
36																						36	
36A		3																				36A	
37		1																				37	
38		2																				38	
39		2																				39	
40		4																				40	
41		2																				41	
42		1																				42	
43		2																				43	

Appendix 7 – Trap-catch monitoring report

Operation name:	Kohi Point
Area involved:	86 hectares
Monitoring method:	NPCA “Protocol for Possum Population Monitoring using the Trap-Catch Method”.
Field operative:	R Wade – Registration No. 1617
Timing:	Monitoring carried out on 03/3/10 to 06/03/10
Weather conditions:	Night one - fine and calm Night two - fine and calm Night three - fine and calm
Trap type and set:	Victor No. 1, raised of the ground
Trapping regime:	Lines of ten traps, set for three nights
Number of lines:	3
Line locations:	See attached map
<u>Summary of results:</u>	(Also see line summary sheet)

Kohi Scenic Reserve

Weighted Catch Rate:	1.1 %
	2.2 Approximate 95% confidence interval +/-
Combined Standard Error:	1.1 %

Discussion

All traps were raised set as there is Kiwi-birds present in the area which might have some affect (less catching) on trapping the possums.

Observation

Good numbers of native birds present with 1 rats caught on the post monitor.

TRAP-LINE SUMMARY Kohi point February 2010										
Line number	Pre	Post	Maintenance	Trap-nights	Habitat	Stratum	Possums caught	Possum escapes	Non-targets	Sprung/empty
1		*		30		1	-	-	-	-
2		*		29.5		1	-	-	1	-
3		*		30		1	1	-	-	-

