



Detection & monitoring of pest mammals using DNA – an overview of EcoGene[®] services

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Landcare Research
Manaaki Whenua

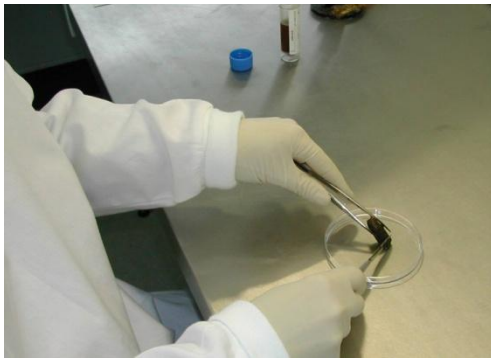


Background

- EcoGene® (est. 2008), business unit within Landcare Research, Tamaki.
- DNA-based diagnostic service for ecological applications
- Development of services, advice on trial design, analysis of genetic data and statements of evidence for court
- ISO 17025 accreditation for specific services

DNA for pest monitoring

- Species detection from scat, hair, tissue, saliva
- Detecting origin and movements of individuals
- Diet analysis from gut contents/scat



Island incursions

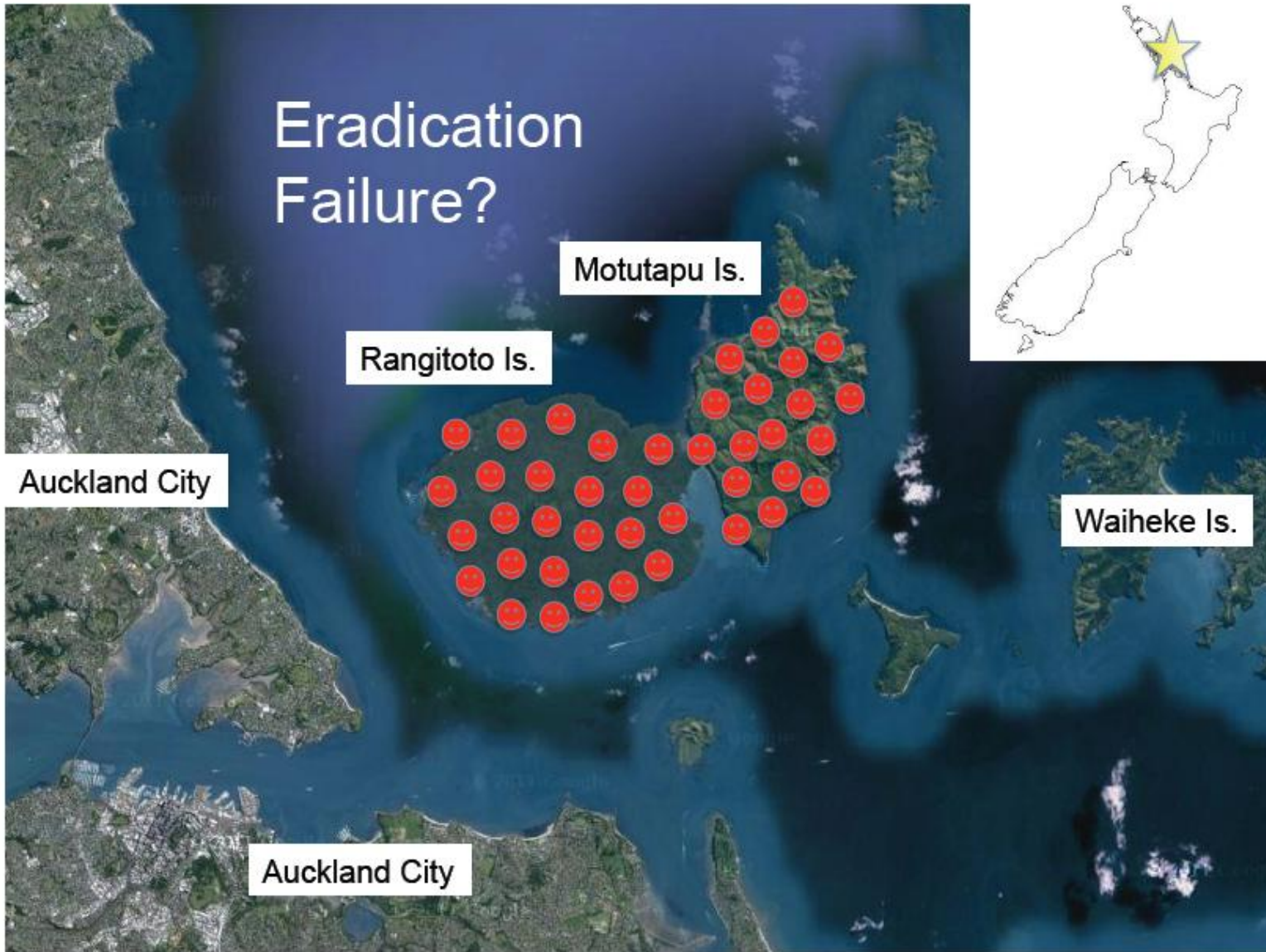
Determining whether captures following eradication are breeding residents or new immigrants



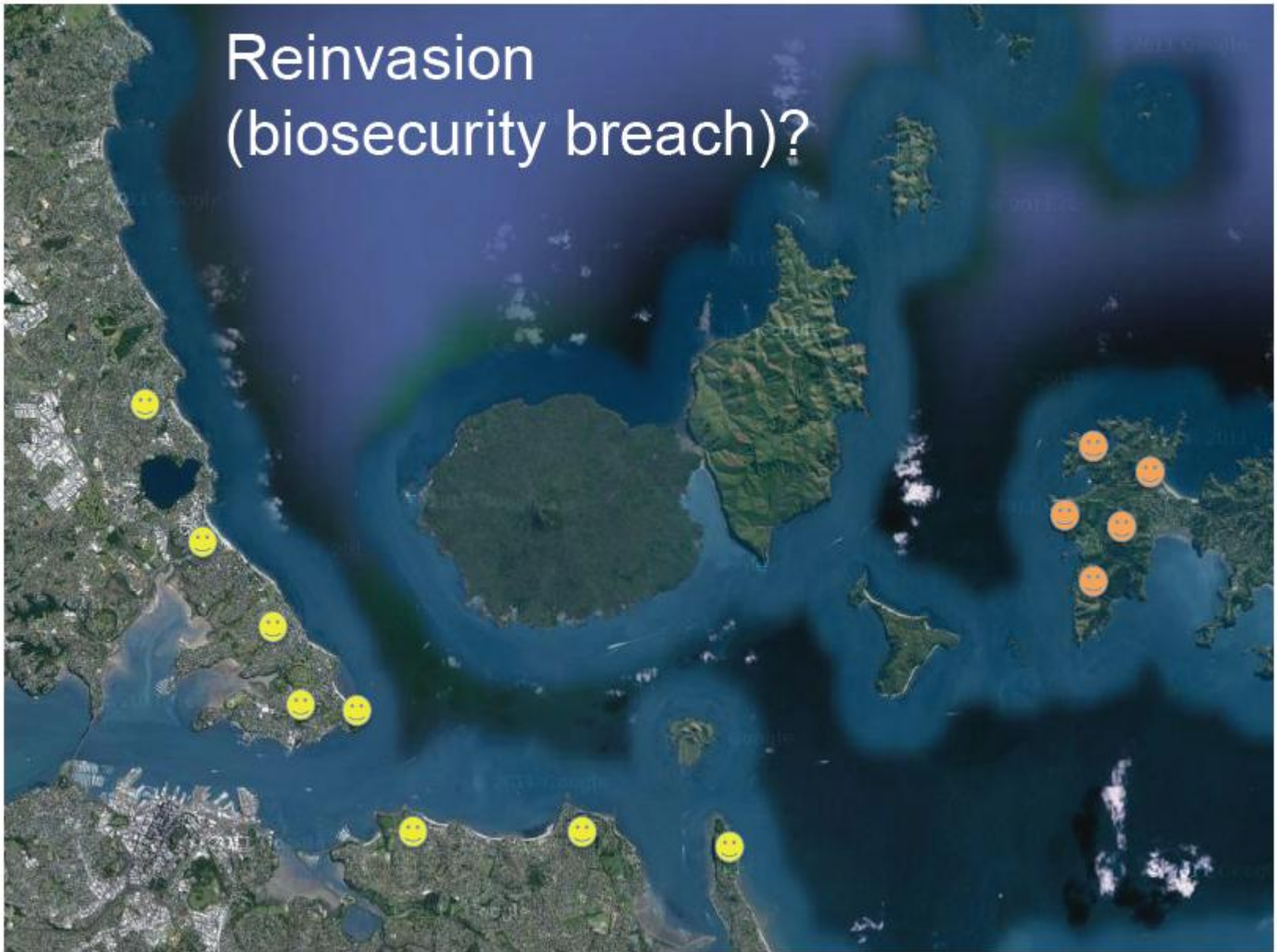
- Baseline data required from pre-eradication population and source populations
- Assess baseline levels of genetic similarities within/between locations



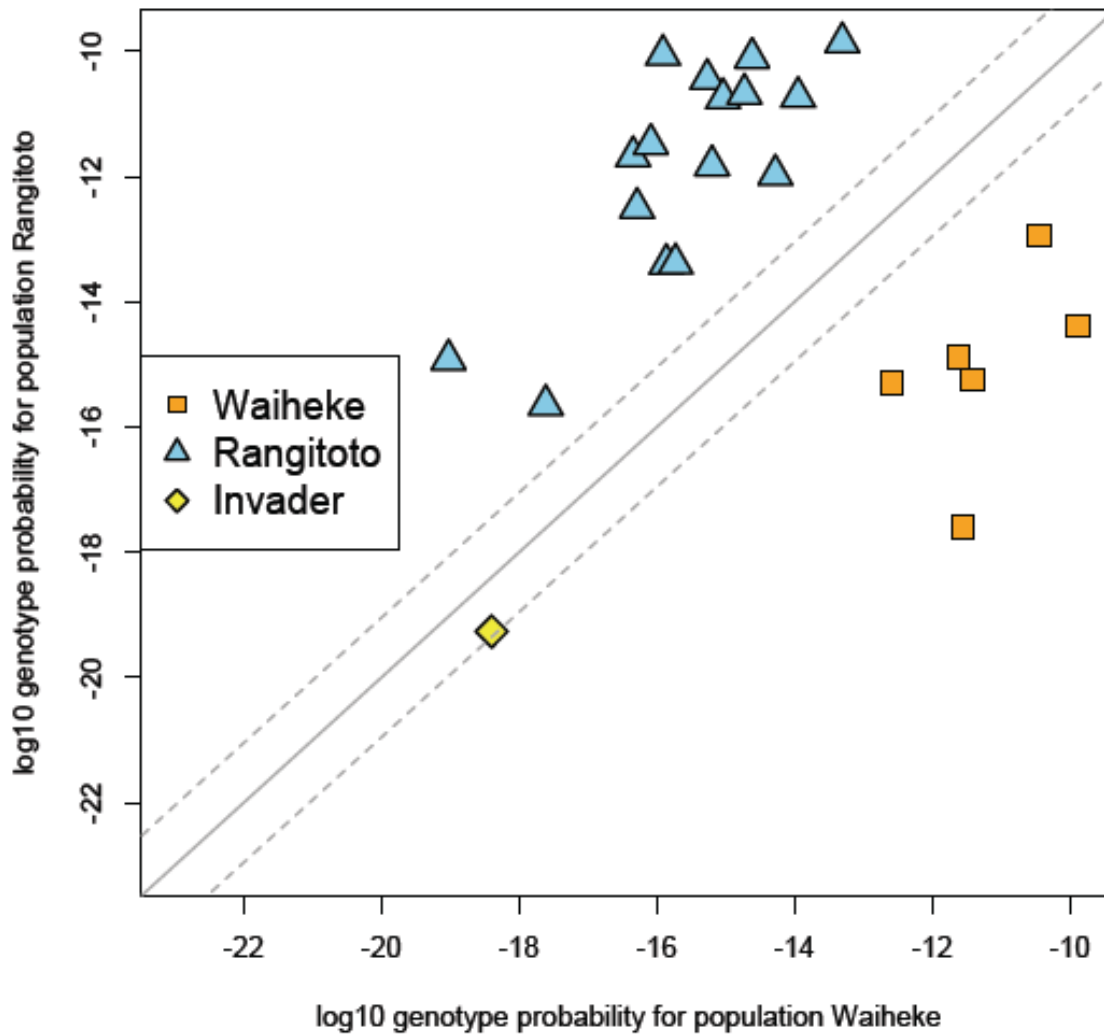
Eradication Failure?



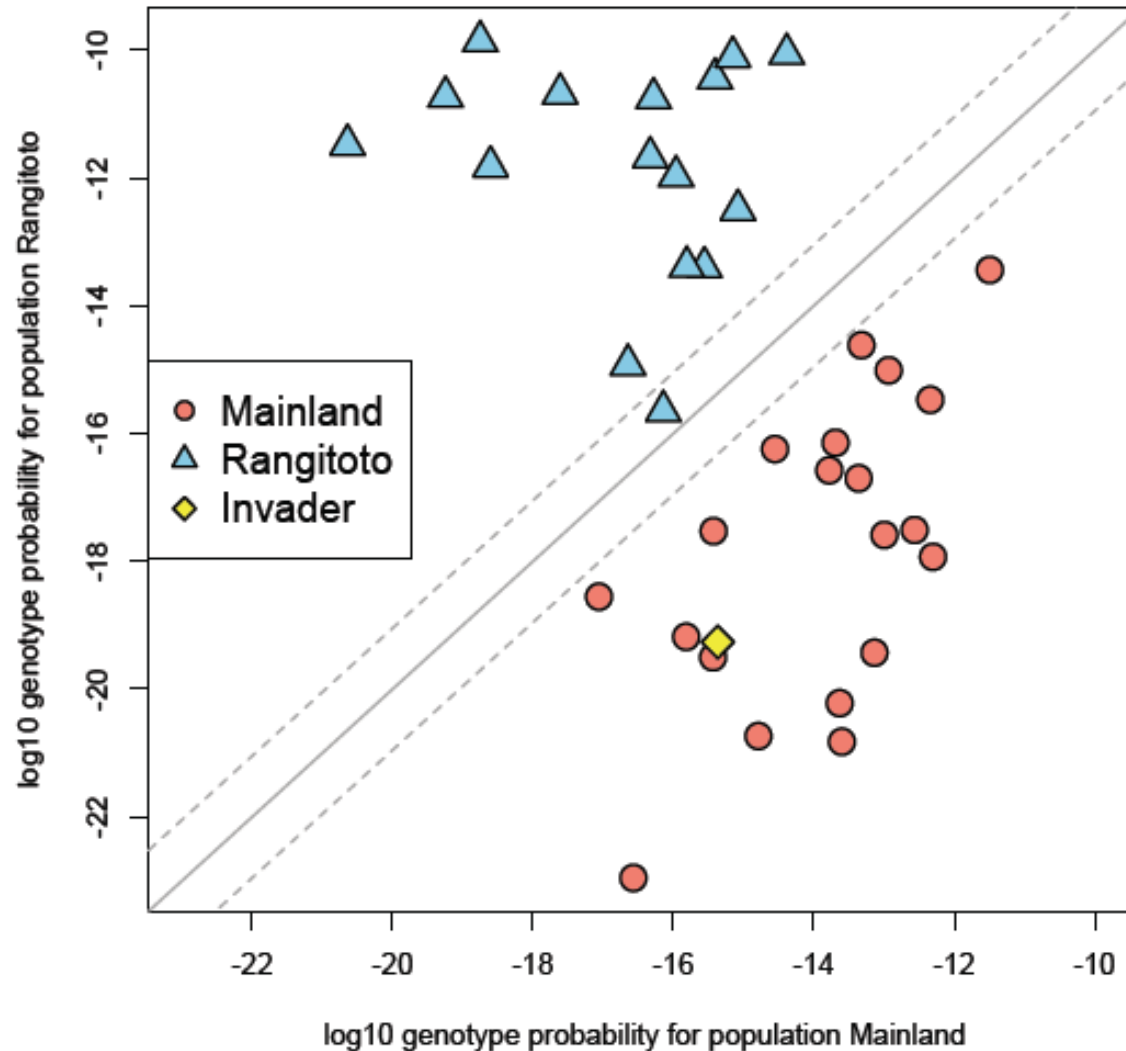
Reinvasion (biosecurity breach)?



Genetic Assignment



Genetic Assignment



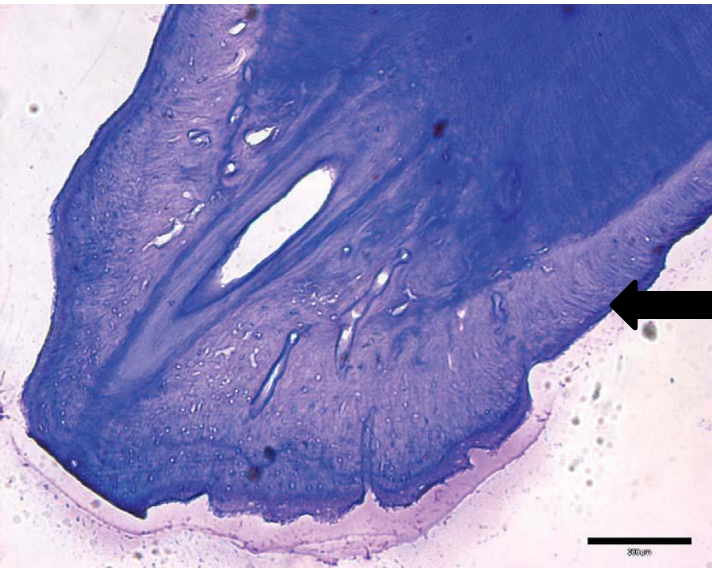
Kapiti Island incursion

- One male caught early 2011, 2 pregnant females mid 2011
- Single or multiple incursions?
- How many individuals & what sex present?
- Used individual genotyping to determine relatedness
- On-going surveillance for scat samples

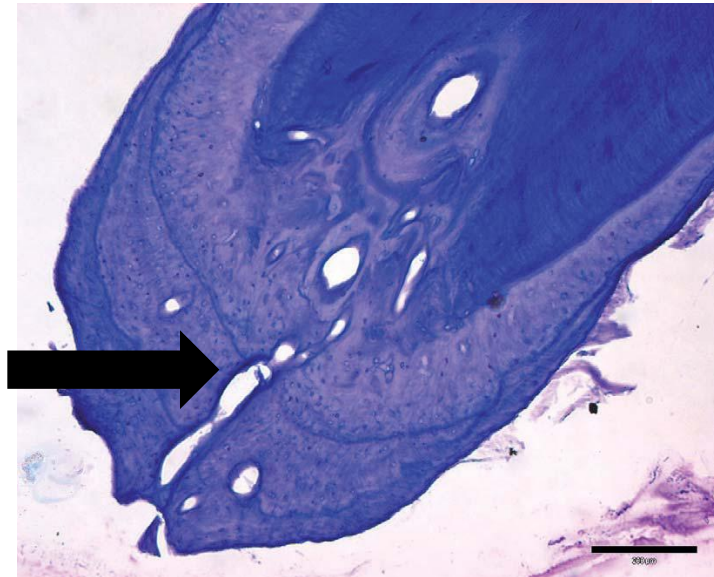


Kapiti Island incursion..cont'd

- Determined single pregnant female founder
- Subsequently gave birth to at least one male & one female in late 2009, age analysis on dentition
- Both captured females were pregnant, mating on island with mature male
- Last stoat fecal samples Oct 2011, genotypes matched previously caught female



Cementum
bands
1yr Male
2 yr Female



Great Barrier Island visitor

- Confirm species
- How many individuals?
- Determine sex
- Did it actually get there?



Kiwi predation by dogs

- Use swabbing techniques
- Several swabs required, pooled and replicated 10x at least



- DNA profiling of individual dogs using a multiplex of 16 loci/71 alleles
- Can compare with scat/hair from suspects





Case example

Sample ID	Can_1	Can_2	Can_3	Can_4	Can_5	Can_6	Can_7	Can_8	Can_9	Can_10	Can_12	Can_13	Can_14	Can_15	Can_16	Can_17
S	134 138	129 131	118 118	188 194	235 245	284 284	183 183	236 240	175 179	278 297	138 146	181 181	221 229	299 303	212 216	105 105
K1	134 138	129 131	118 118	188 194	235 245	284 284	183 183	236 240	175 179	278 297	138 146	181 181	221 229	299 303	212 216	105 105
K2	134 138	129 131	118 118	188 194	235 245	284 284	183 183	236 240	175 179	278 297	138 146	181 181	221 229	299 303	212 216	105 105

S: Suspect
 K1: Kiwi one
 K2: Kiwi two

Current developments

- Obtained ISO accreditation for forensic identifications of species
- Improving field sampling methodologies and development of kits



Sample processing

Samples submitted with test request form downloaded from www.ecogene.co.nz

Any tests that are required and not currently available, please contact us to discuss development

Turnaround times vary – urgent samples can be completed within a day for most methods



Test Request Form

Post: Private Bag 92174, Auckland 1142, New Zealand
 Delivery: 251 Morningside Road, St Johns Auckland 1072, New Zealand
 Phone: +64 9 574 4225
 Fax: +64 9 574 4101
 Email: ecogen@kand.co.nz
 Web: www.ecogene.co.nz

Customer Information

Company Name _____	Phone _____
Contact Name _____	Fax _____
Invoice Address _____	Email _____
	Date _____

Preferred result format: Email Fax Post

Test Code Key

Species Identification	SI	Disease screening	
Vertebrate Pest Monitoring	VPM	avian malaria	D61
Genotyping	G	chytrid fungus	D62
		whakaoa virus	D63

*contact us for a disease coding protocol on the only-ecogene service you require

Species Type/Host Information	Sample Type (Tissue, blood, hair, feathers, scall, swab)	No of samples	Test Code	Cost *
Client to add specific comments:			Total	

By signing this document I am requesting that the DNA-diagnostic services above be performed and confirming that there is funding for this work. On completion of work I will endeavour to ensure the timely payment of Invoices (normally within 30 days of receipt).

Signature _____ Date _____

Official Lab Use Only

Customer Code _____
 Job Code _____
 Invoice No _____
 Date _____
 Initial _____



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- LCR Colleagues: Richard Clayton, Bruce Warburton, Graham Nugent
- University of Auckland, Rachel Fewster

