



An introduction to ...



Landcare Research
Manaaki Whenua

Manaaki Whenua – Manaaki Tangata
Care for the Land – Care for the People

Landcare Research's Core Purpose

To drive **innovation**
to protect and enhance New Zealand's
land-based biodiversity & natural resources
and grow **prosperity**

Who we are

- Experts in environmental research, science, technology
- One of 7 Crown Research Institutes in New Zealand
- Wholly-owned by the government
- \$54.7 m turnover last year
- 315 FTE staff
- 9 sites near clients, universities & other CRIs

Who we work with

We partner with government, the primary sector, businesses & Māori to achieve:

- Improvement in the state of NZ's biodiversity
- Economic vitality through sustainable resource use
- Reduced greenhouse gas emissions
- More informed public policy, regulation & business practice

Managing Invasives Portfolio

Acting Portfolio Leader: Dan Tompkins

Vertebrate pest control & surveillance		Supporting Sanctuaries & Pest Free NZ	
TB eradication		Penguins in Antarctica	
Biosecurity		Wilding pines	
Weed biocontrol		Kauri <i>PTA</i>	



Simon Fowler

RPA1: Beating Weeds

- New weed control tools and strategies (biocontrol)



Fowler, S.V. et al. (Online early)
Investigating the poor performance of heather beetle, *Lochmaea suturalis* (Thompson) (Coleoptera: Chrysomelidae), as a weed biocontrol agent in New Zealand: Has genetic bottlenecking resulted in small body size and poor winter survival? *Biological Control*.

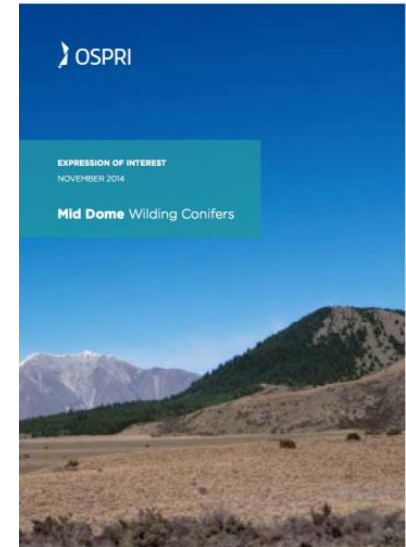
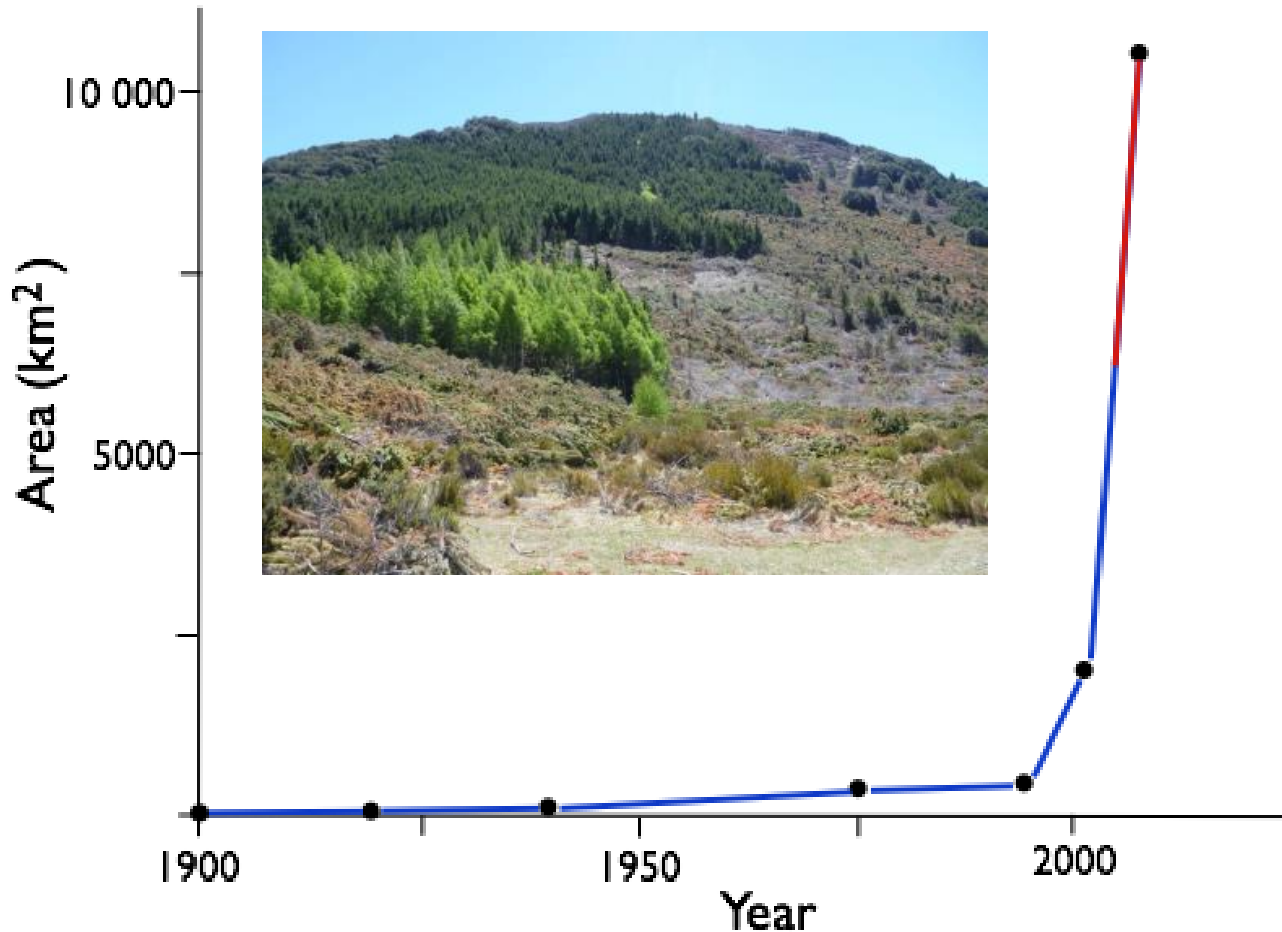




Simon Fowler

RPA1: Beating Weeds

- Wilding pine control - management triage (biocontrol potential)





Lynley Hayes

RPA2: Applied Weed Biocontrol

- Operational delivery of weed control both in New Zealand and overseas



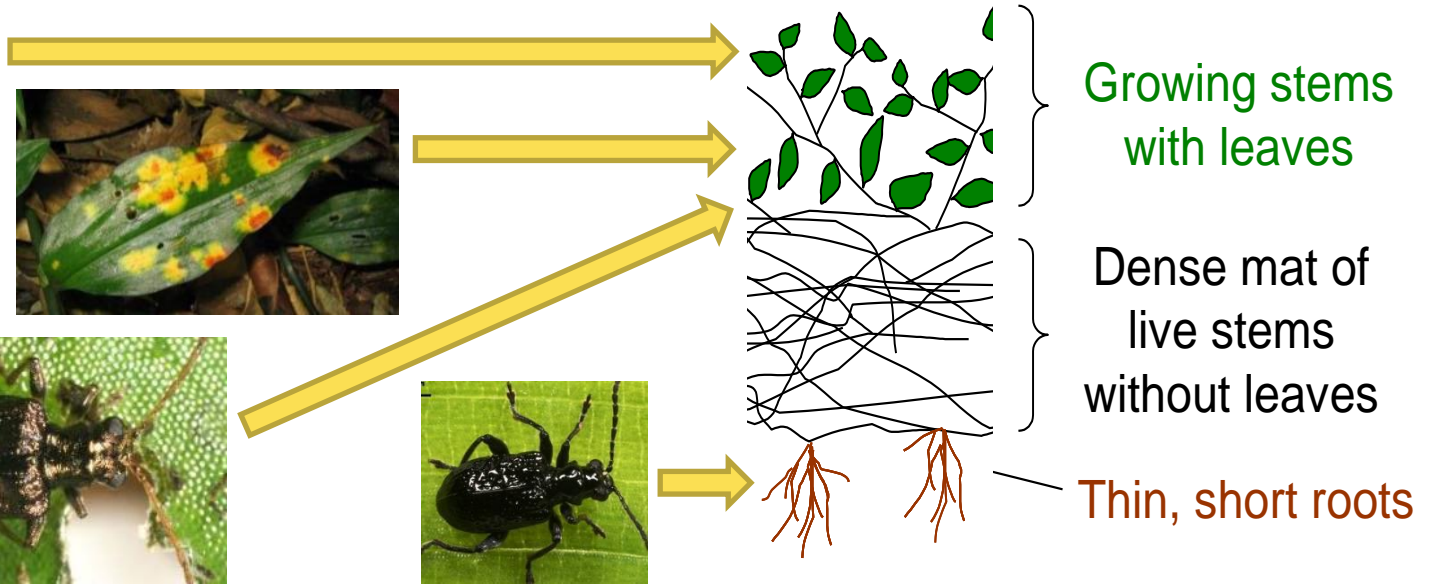
Cook Islands NEWS
AS SOLID AS THE ISLANDS WE STAND FOR

Mile a minute about to meet worst enemy

Wednesday April 15, 2015 Written by [Cameron Scott](#) Published in [Local](#)



Tradescantia



- Biological control of submerged aquatic weeds





Roger Pech

RPA3: Reducing Mammal Impacts

- Extend conservation gains from managed sites to allow native biota to persist, increase and disperse across landscapes

Ecological Applications, 23(7), 2013, pp. 1707–1721
© 2013 by the Ecological Society of America

Invasive mammals and habitat modification interact to generate unforeseen outcomes for indigenous fauna

GRANT NORBURY,^{1,5} ANDREA BYROM,² ROGER PECH,^{2,3} JAMES SMITH,¹ DEAN CLARKE,⁴ DEAN ANDERSON,²
AND GUY FORRESTER²



Ecological Applications, 23(5), 2013, pp. 1075–1085
© 2013 by the Ecological Society of America

Predicted responses of invasive mammal communities to climate-related changes in mast frequency in forest ecosystems

DANIEL M. TOMPKINS,^{1,4} ANDREA E. BYROM,² AND ROGER P. PECH^{2,3}



Connectivity and invasive species management: towards an integrated landscape approach

Alistair S. Glen · Roger P. Pech ·
Andrea E. Byrom

Austral
ECOLOGY A Journal of ecology in the Southern Hemisphere



Austral Ecology (2014) 39, 795–807

Pest fencing or pest trapping: A bio-economic analysis of cost-effectiveness

GRANT NORBURY,^{1*} ANDY HUTCHEON,^{2,†} JAMES REARDON³ AND
ADAM DAIGNEAULT⁴

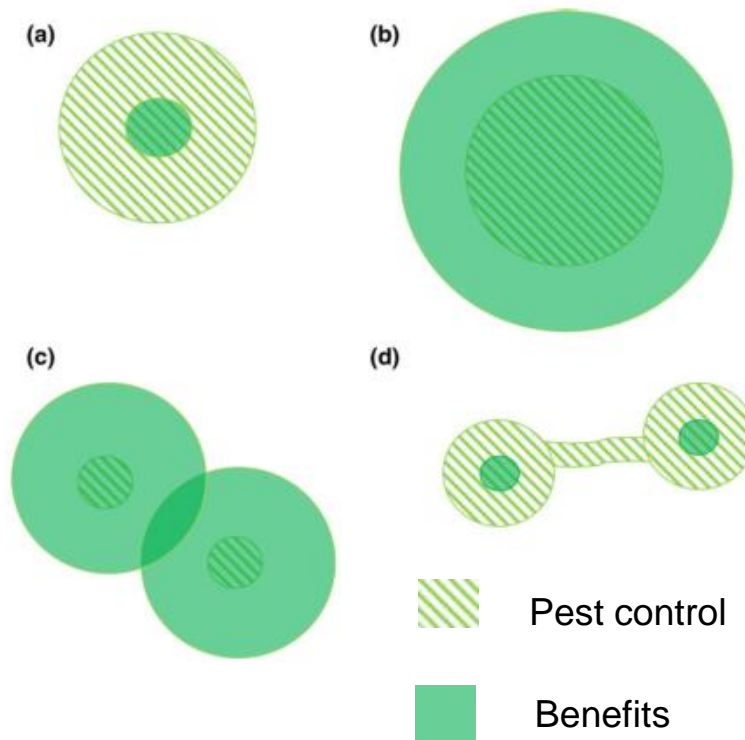
Conservation Biology



Contributed Paper

Effects of Spatially Extensive Control of Invasive Rats on Abundance of Native Invertebrates in Mainland New Zealand Forests

WENDY A. RUSCOE,^{*†} PETER J. SWEETAPPLE,^{*} MIKE PERRY,^{*} AND RICHARD P. DUNCAN^{*‡}



Journal of Applied Ecology



Journal of Applied Ecology 2012, 49, 1296–1305

doi: 10.1111/j.1365-2664.2012.02219.x

Impacts of an invasive herbivore on indigenous forests

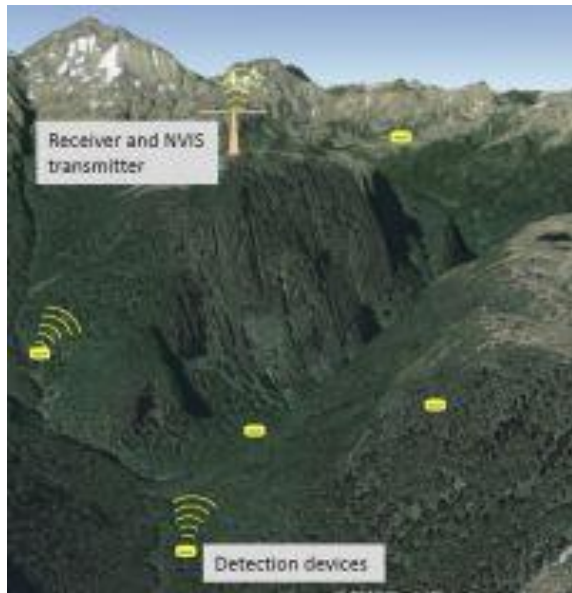
Andrew M. Gormley^{1*}, E. Penelope Holland¹, Roger P. Pech^{1,2}, Caroline Thomson¹ and
Ben Reddiex³



Penny Fisher

RPA4: Mammal Control Tools

- Innovative control and detection tools and strategies
- Reducing the costs of aerial and ground-based control;
- Reducing the adverse impacts of aerial and ground-based control (welfare, residues, non-targets);
- Increasing community engagement in pest programs.



Norbormide-based approach for rats

*Market failed
Compound (NRB)*

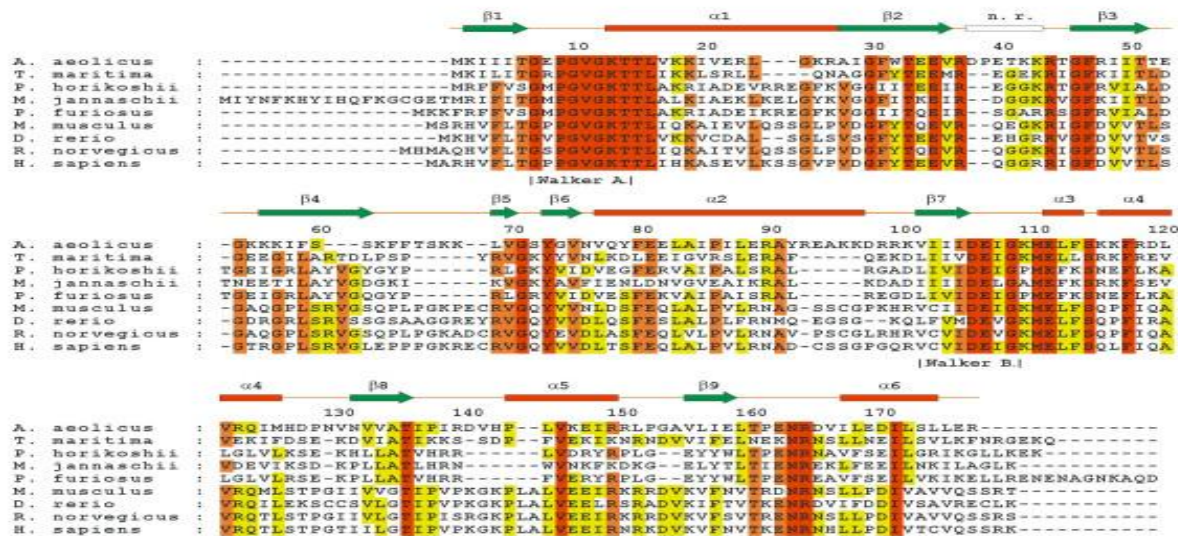


*Effective species-
selective rat toxin
“Prodrugs” (DR8)*

- Onset of symptoms extremely rapid
- Low consumption
- High rate of sublethal dosing
- Low kill rate in control operations and extreme bait shyness

- Onset of symptoms delayed 10min to 90mins
- Significant increase in toxic bait consumption 1gm to 3gm (~ 5 x lethal dose)
- Significant increase in kill rate 25% (NRB) to 100% (DR8)

Species-selective toxicants – genome mining, the “Achilles heel” approach



- Comparing the genetic maps of pest species with non-target species to identify pest-specific receptors suitable for toxin design.
- High priority targets are those with significantly different sequences in predicted receptor binding that can be targeted to be lethal.

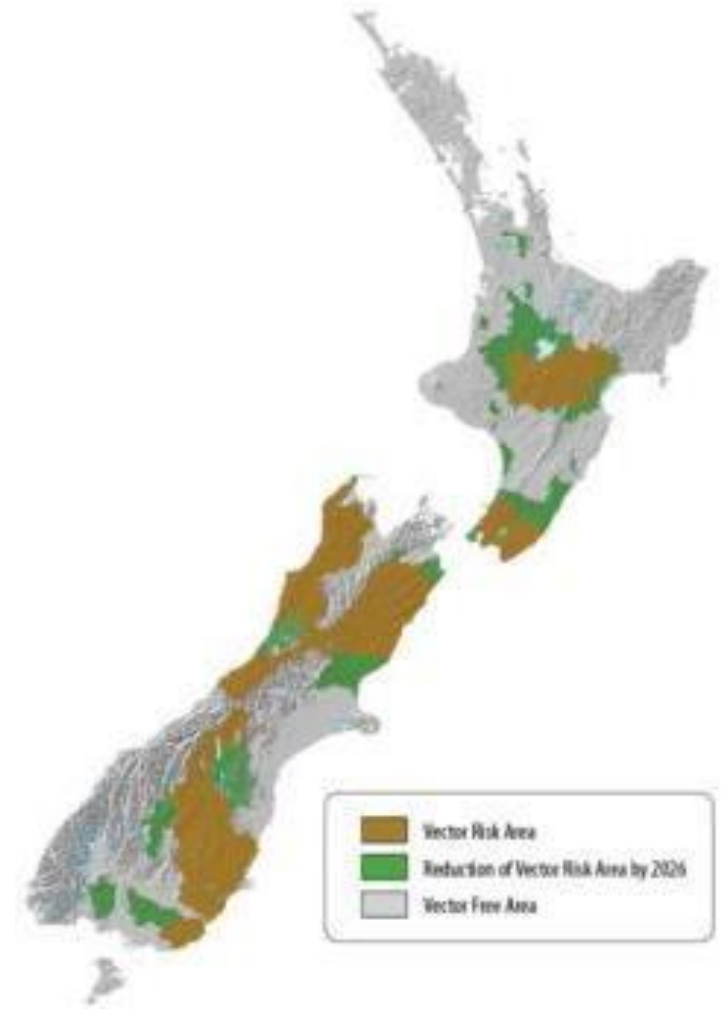
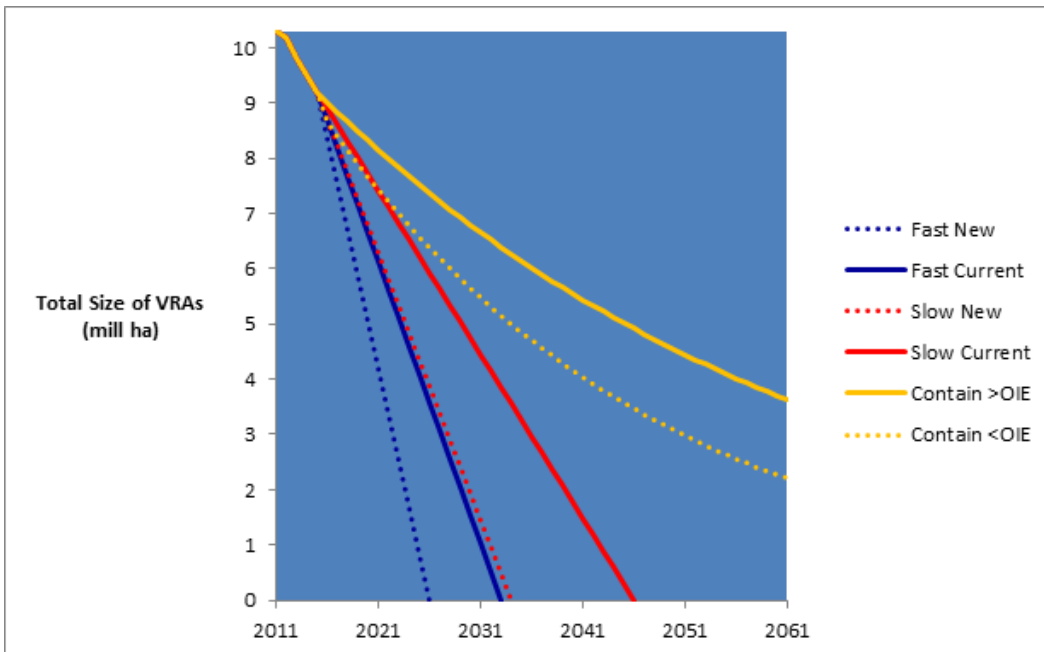


Graham Nugent

RPA5: TB freedom

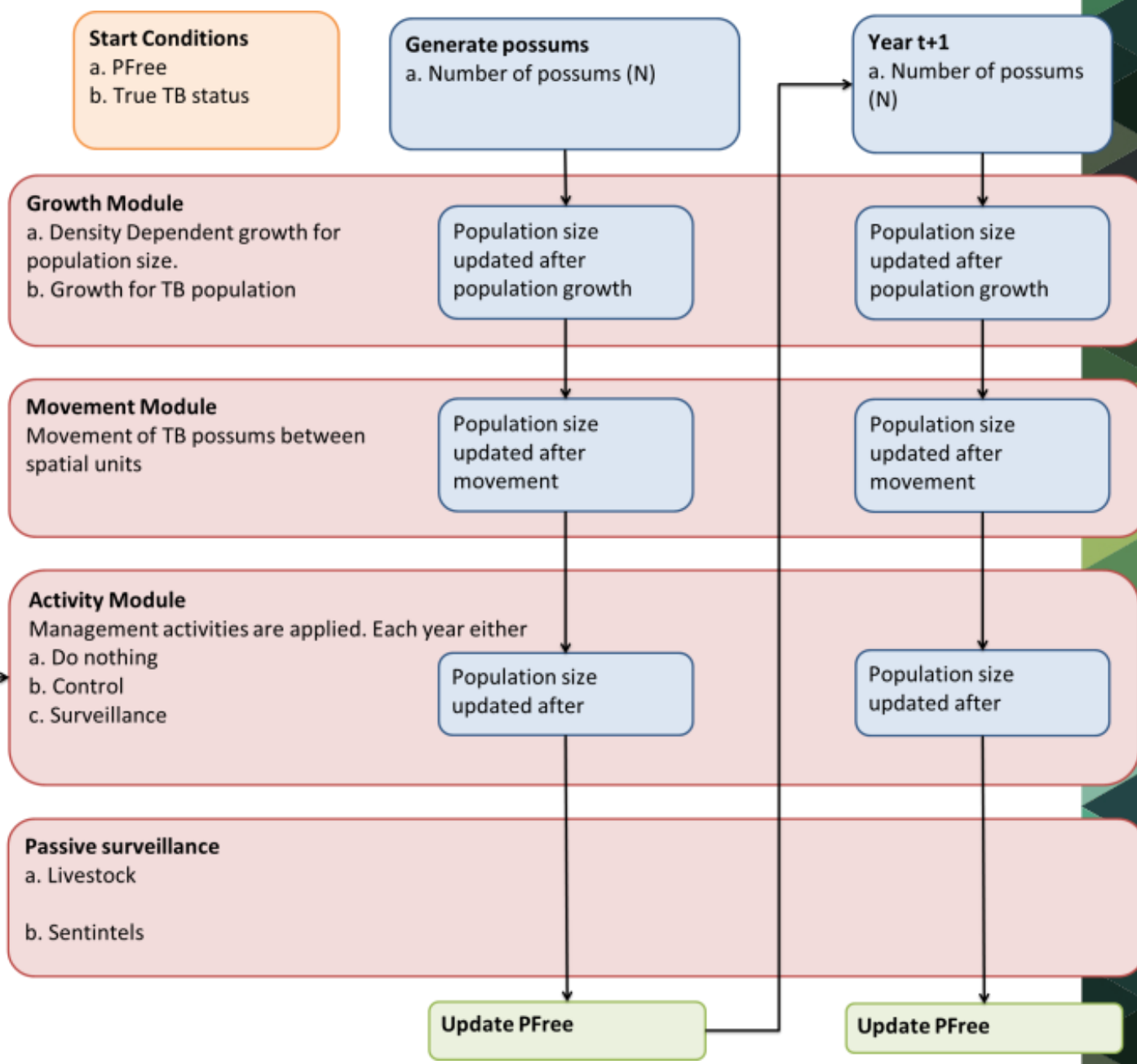
- Supporting TBFree New Zealand's bovine tuberculosis management goals

Strategic Options for National Pest Management Plan: Possum TB Freedom Model



Scenario Modelling
Options to be modelled

1. Cease all management
2. Eradication 2.5m ha by 2026
3. Containment
4. Eradication (current approaches)
5. Rapid eradication





Darren Ward

RPA6: Strategic developments

- Building new pre- and post- border pest management capability

New Zealand Veterinary Journal, 2015

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Short Communication

Exudative cloacitis in the kakapo (*Strigops habroptilus*) potentially linked to *Escherichia coli* infection

DJ White*, RJ Hall†, R Jakob-Hoff‡, J Wang†, B Jackson‡ and DM Tompkins*§



CSIRO PUBLISHING

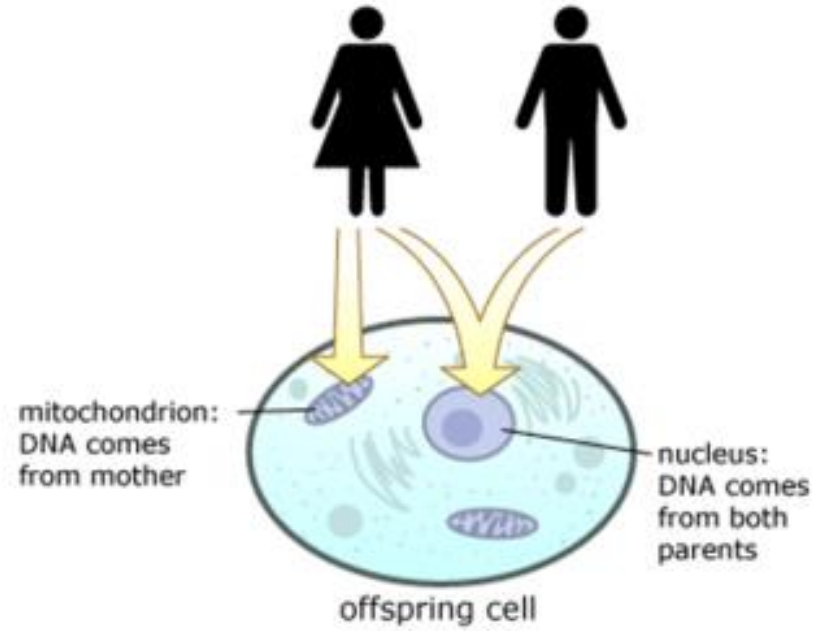
Emu, 2015, 115, 185–189
<http://dx.doi.org/10.1071/MU14068>

Short Communication

First report of a feather loss condition in Adelie penguins (*Pygoscelis adeliae*) on Ross Island, Antarctica, and a preliminary investigation of its cause

Wray W. Grimaldi^{A,E}, Richard J. Hall^B, Daniel D. White^C, Jing Wang^B,
Melanie Massaro^D and Daniel M. Tompkins^C





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