






Development of re-setting toxin delivery devices for stoats and rats



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New Zealand

- The endemic fauna of NZ evolved in the absence of mammalian predators – their arrival devastating
- 40% land bird spp gone
- Of the remainder, proportion classed as threatened one of the highest in the world
- Introduced rats & stoats major cause





Resetting devices would be a good addition to toolkit!

Specifications

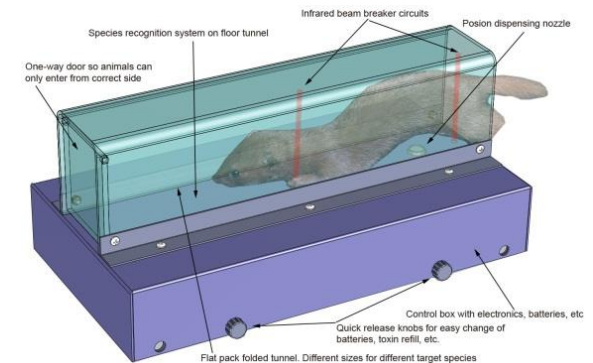
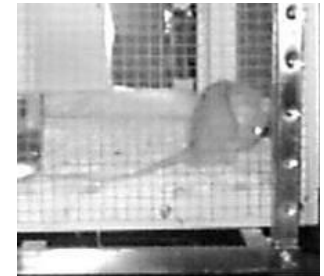
- Long-life (12 month service interval)
- Species specific
- Capable 100 kills
- Incorporate novel toxins
- Data logging capability (number fires)
- Cost-effective vs. current methods





Spitfire Development

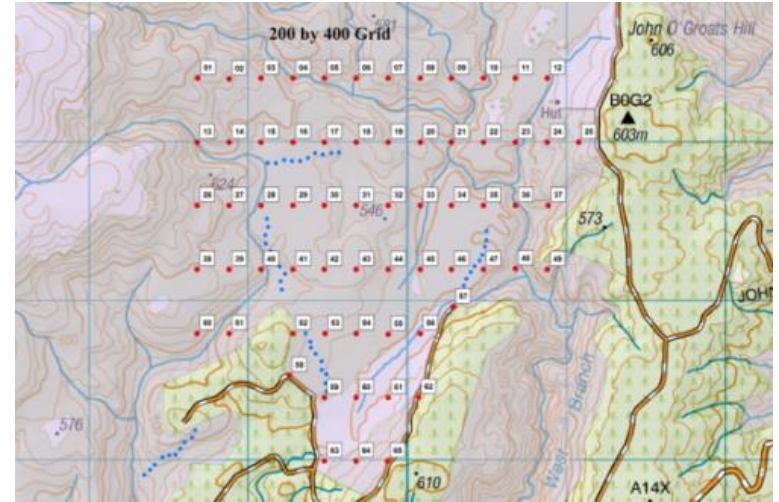
- Spitfires: 5 years of development
- Animal triggers Spitfire - 800 mg toxin squirted onto belly, which is ingested by grooming
- Proof of concept trials on stoats in 2009 with PAPP
- Same internal components can have different triggers, housing & toxins depending on species (eg. stoats, rats, ferrets, feral cats, possums)



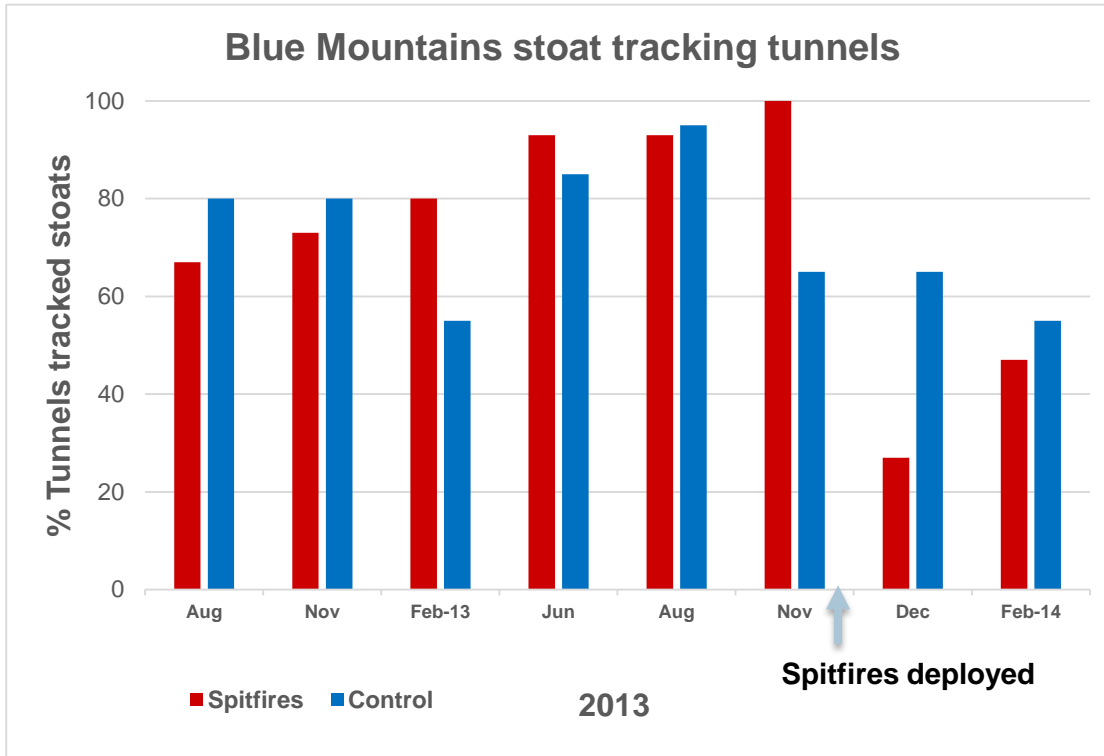
Proof of performance for stoats



- 65 spitfires
- 400 ha



Stoat Spitfire field trial



- Spitfires triggered 11 times 26 Nov – 14 Dec
- Tracking tunnels set 16th Dec

What toxin for rats?

- Spitfires squirt 800mg, assume rat ingests 500mg
- PAPP not lethal enough



Rat Spitfire lab trials

0.55% 1080

- 15/15 wild Norway rats died
- 14/15 ship rats died



12.5% Zinc Phosphide

- 17/20 wild Norway rats died
- 8/8 ship rats died



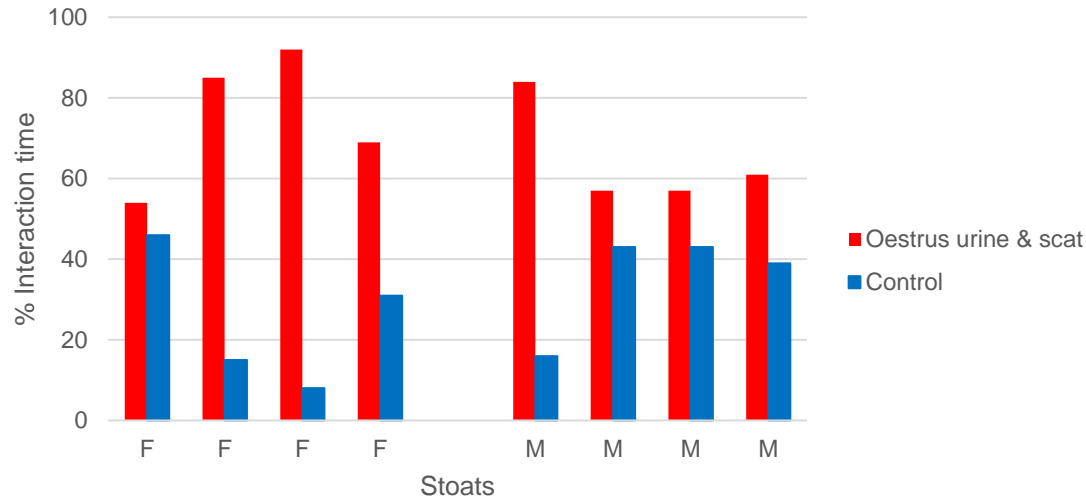
Methods - stoats

- Stoats had been in captivity c. year
- Females hadn't mated, so stayed in oestrus over summer

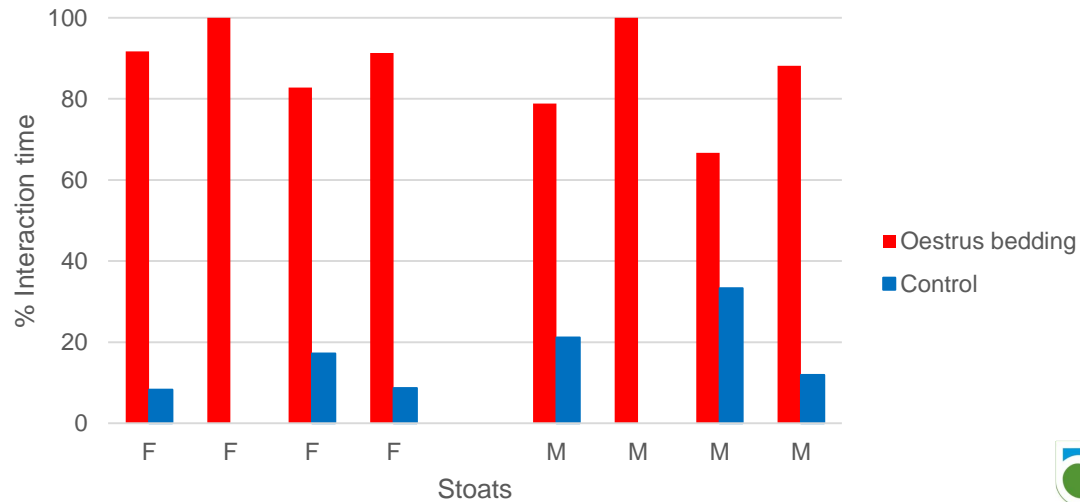


Stoat lure trials: Nov-Feb

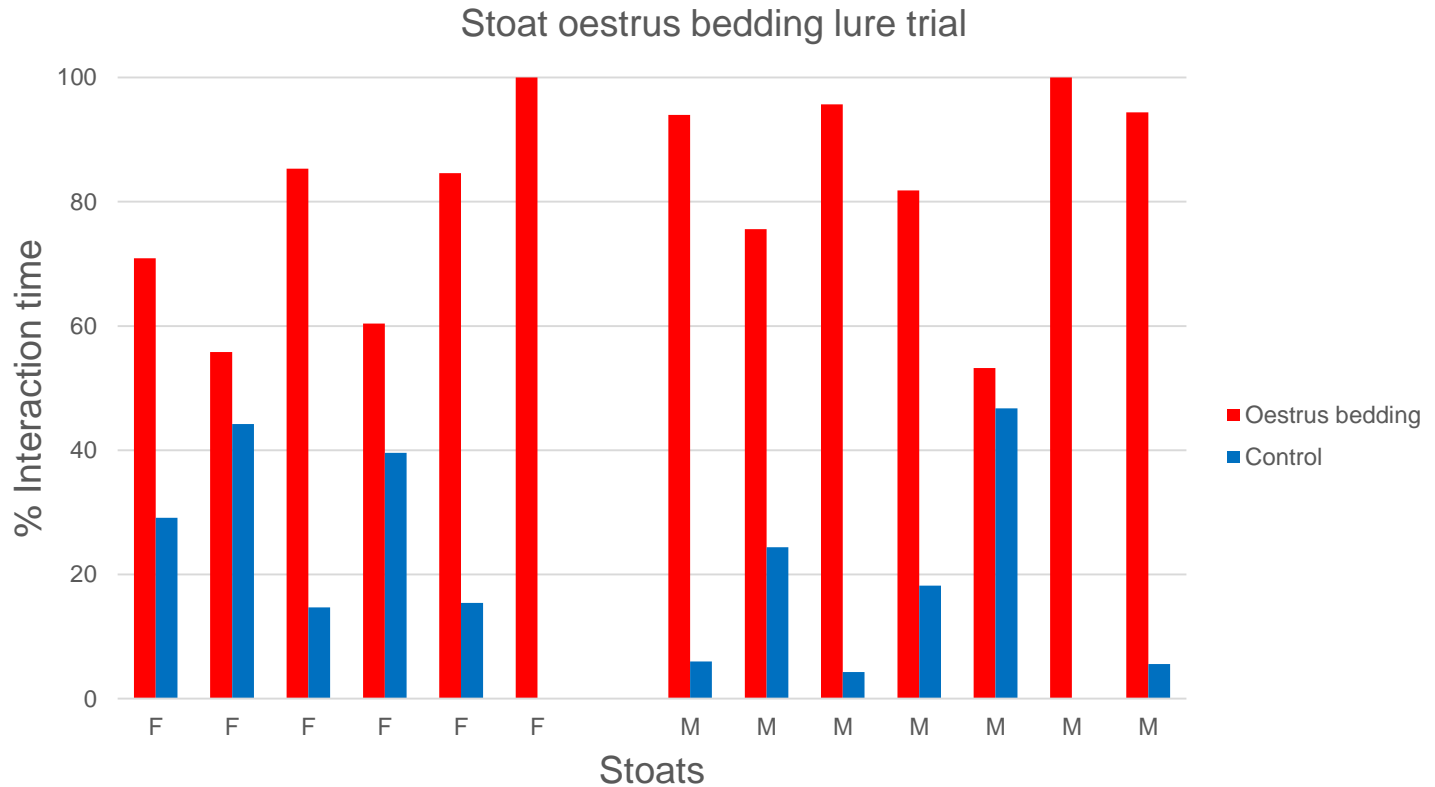
Stoat oestrus urine +scat lure trials



Stoat oestrus bedding lure trial

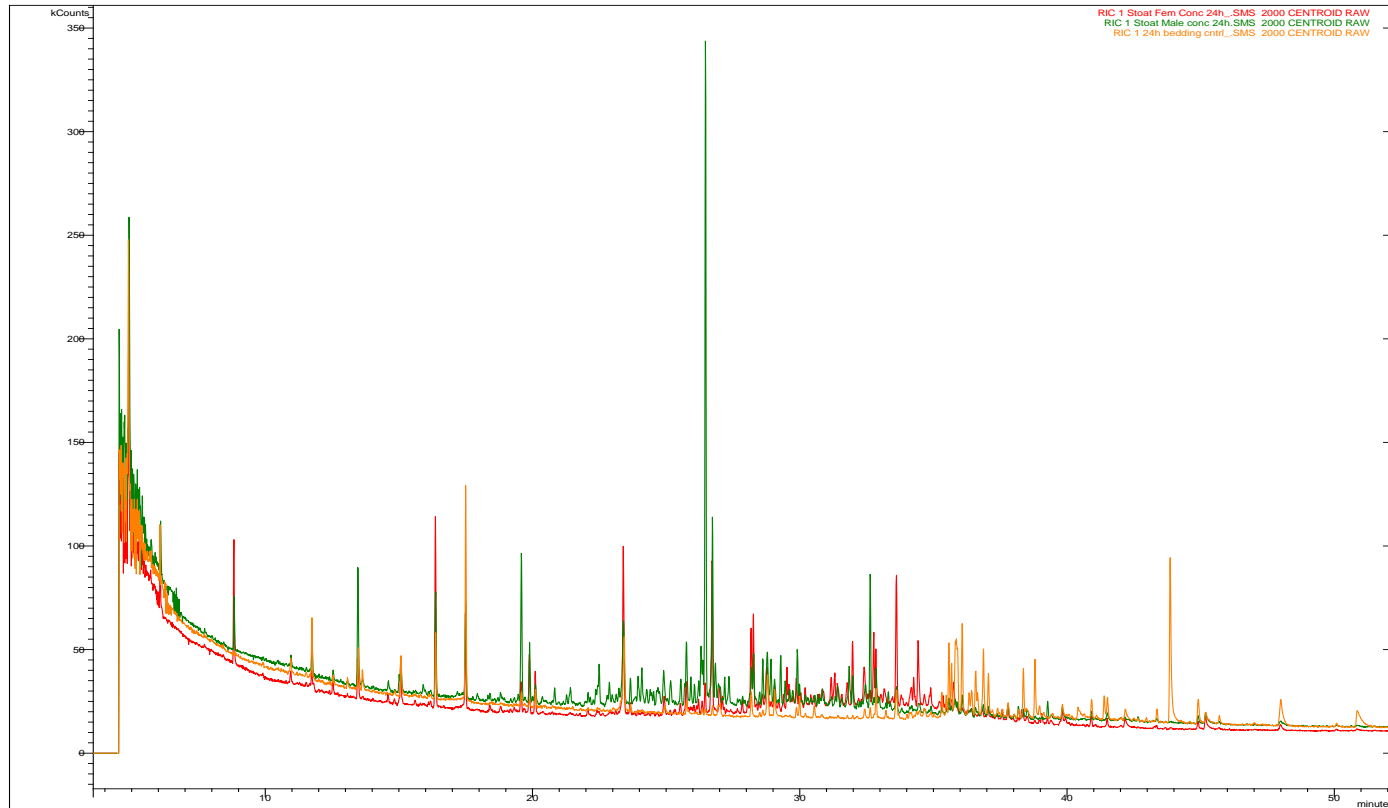


Stoat lure trials: Mar-Aug



24 hr volatile collection from bedding – Andrew Twidle

Overlaid Chromatogram Plots



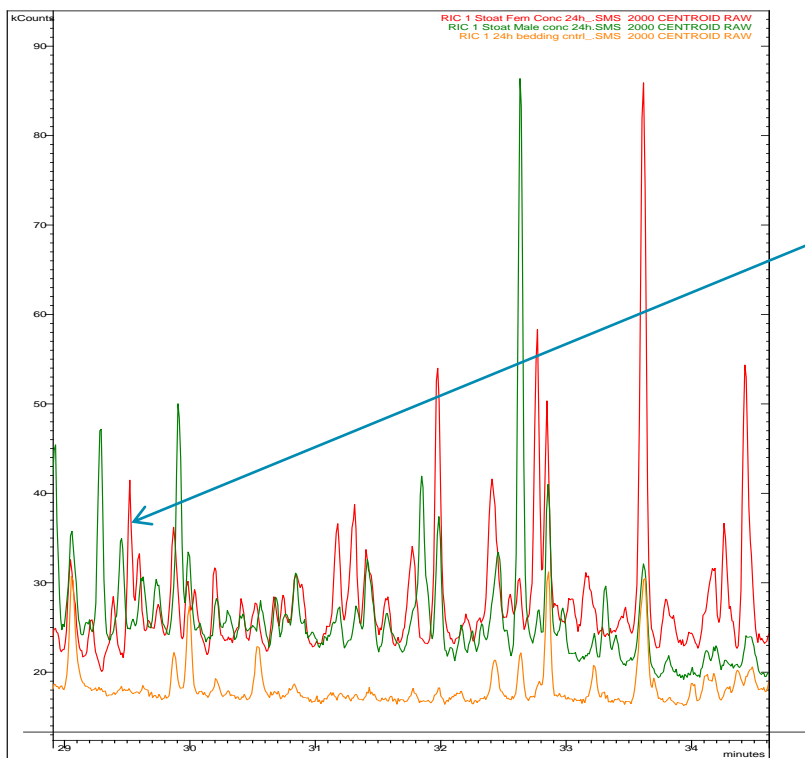
Red trace = Female bedding
Green trace = male bedding
Brown trace = control bedding

Analysis of volatiles – Andrew Twidle

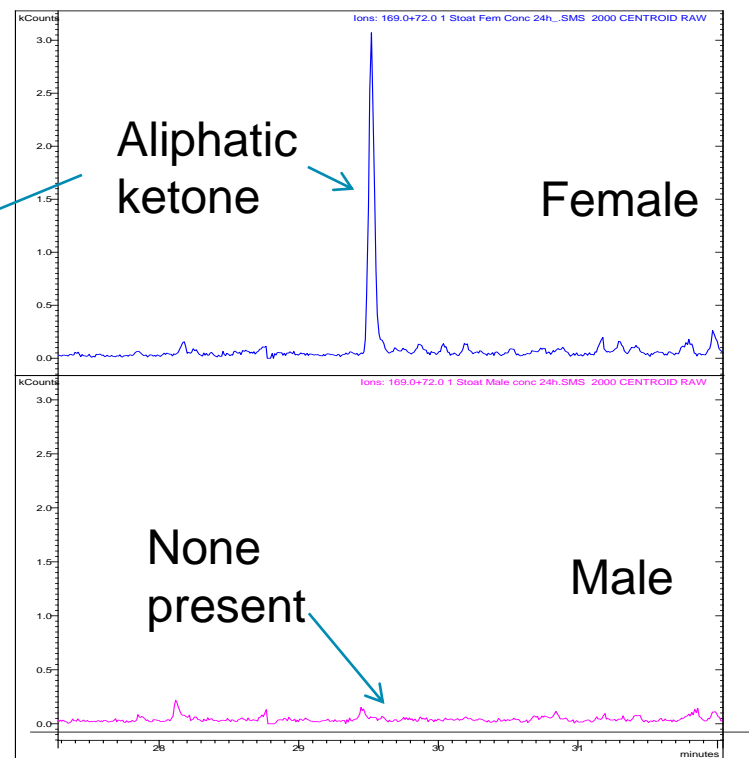
Zoom in of chromatogram – one female unique compound (red trace)

Ion search and identification of unique compound in female vs male

Overlaid Chromatogram Plots



Chromatogram Plots



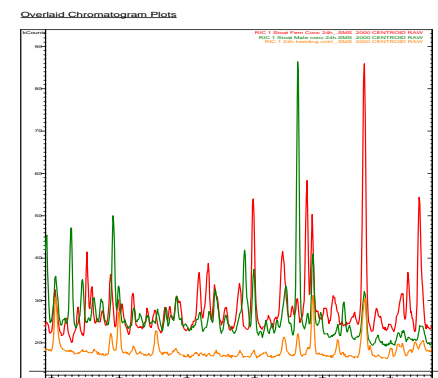
Plans for 2015

Spitfires:

- Rat 1080 Spitfire field trial
- Continue development of feral cat & multi-species Spitfire

Lures:

- Solid phase micro extraction (SPME) gas chromatographic analysis
- GCMS profiles
- Cheap long-life liquid lure!



Partners and Collaborators

