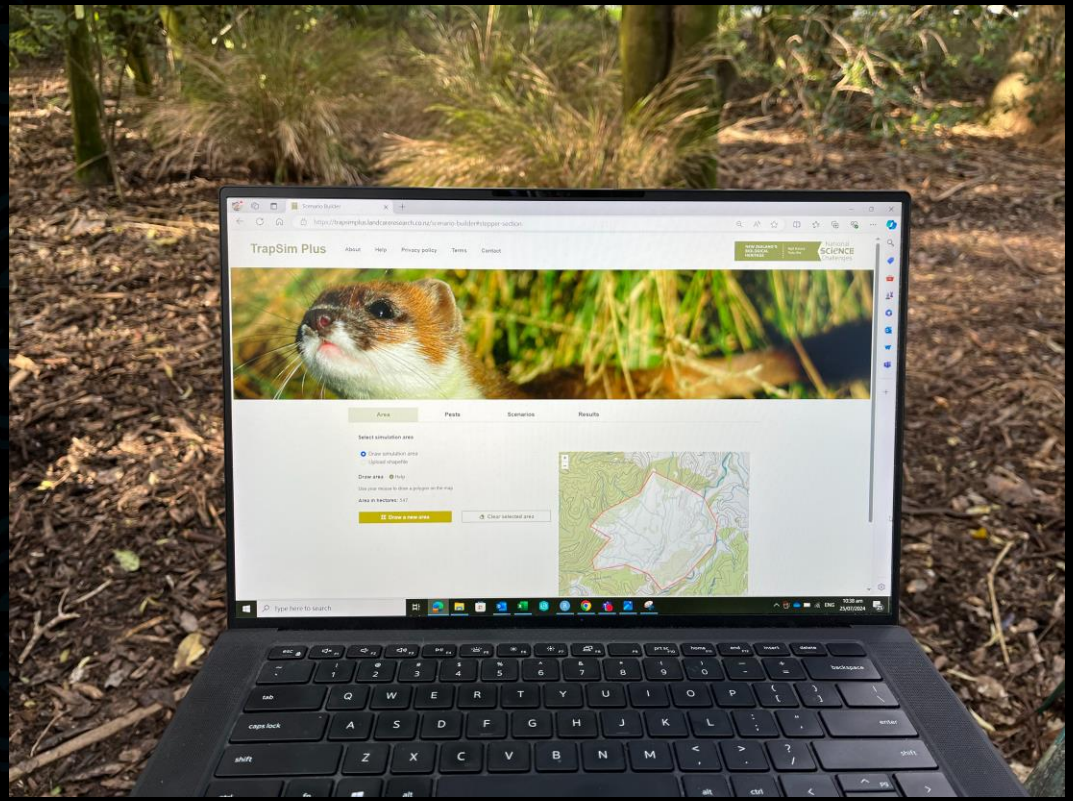
TrapSim Plus:

A simple to use planning tool for control of invasive mammals

Manaaki Whenua
Landcare Research



Wildlife Ecology and Management
+
Digital Solutions

Pest Management

The Big ‘Three’

- Brushtail possum
- Norway and ship rats
- Stoats, Ferrets, Weasels

PREDATOR FREE 2050
kia uru ora, return to life

Also:

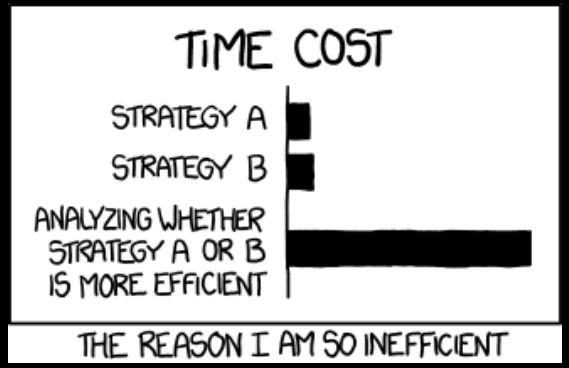
- Goats, Hedgehogs, Mice, Feral Cats…

Landscape Scale Control

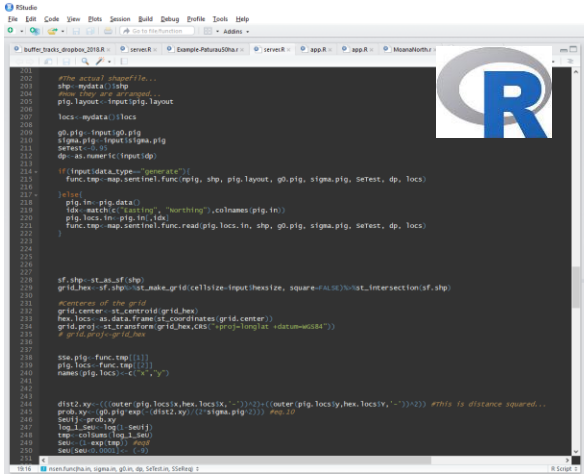
- What type of devices?
- How many devices?
- How long to set them?
- How often should they be checked?

Depends on many factors

- Animal home range size
- Trap interaction rates



Computer simulation models to explore options



PLOS ONE

OPEN ACCESS PEER-REVIEWED

RESEARCH ARTICLE

Refining kill-trap networks for the control of small mammalian predators in invaded ecosystems

Andrew M. Gormley, Bruce Warburton

Published: September 8, 2020 • https://doi.org/10.1371/journal.pone.0238732

TrapSim

- Decision support tool
- For land managers
- Freely available online

Gormley & Warburton (2017) Landcare Research Contract Report LC2993

TrapSim

- Prototype
- Limited functionality
- No guidance for users
- Non-stable platform
- Costs not included

TrapSim Plus

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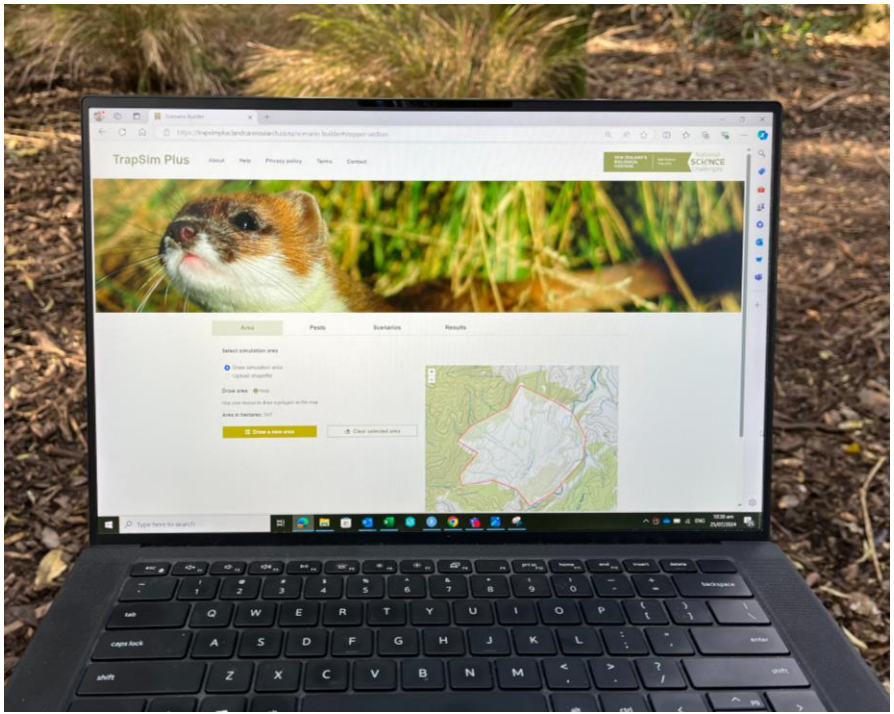
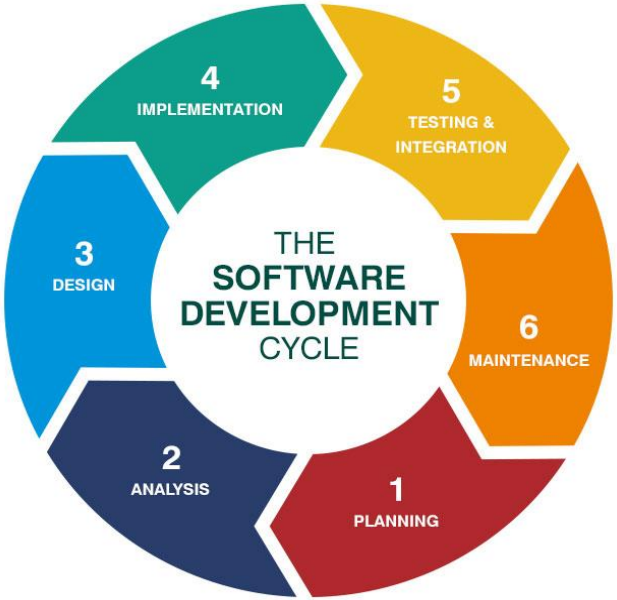
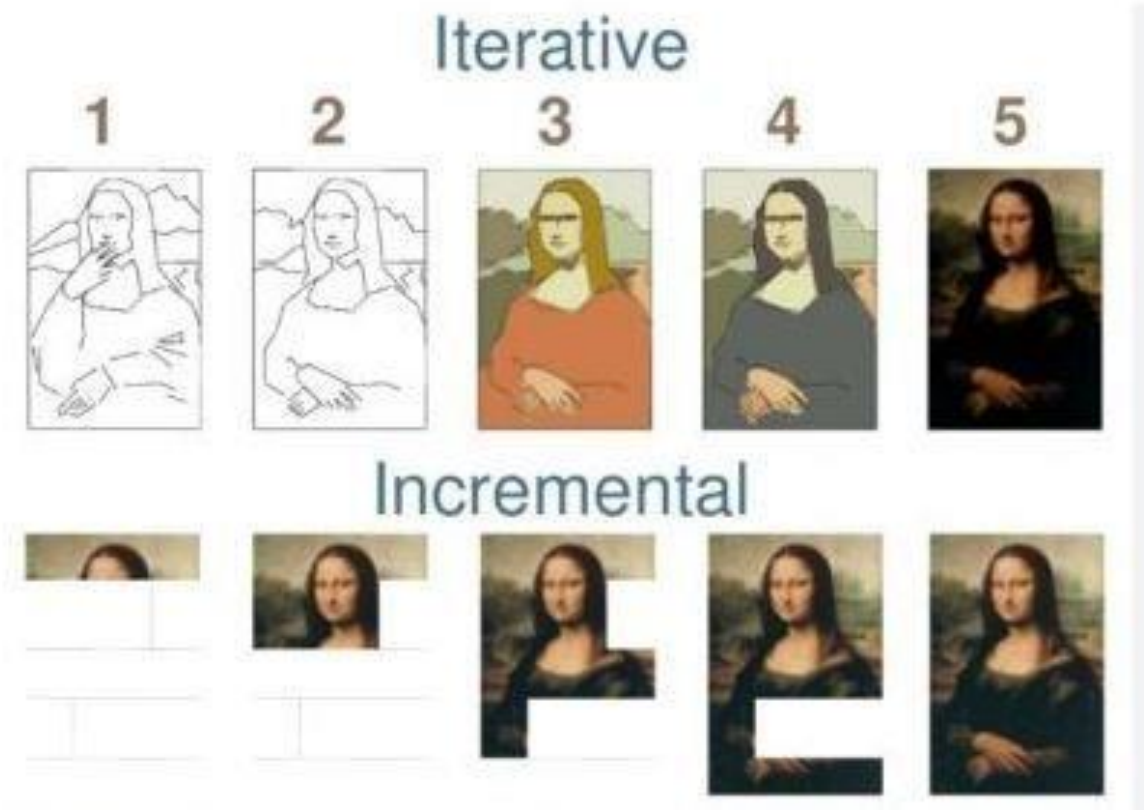


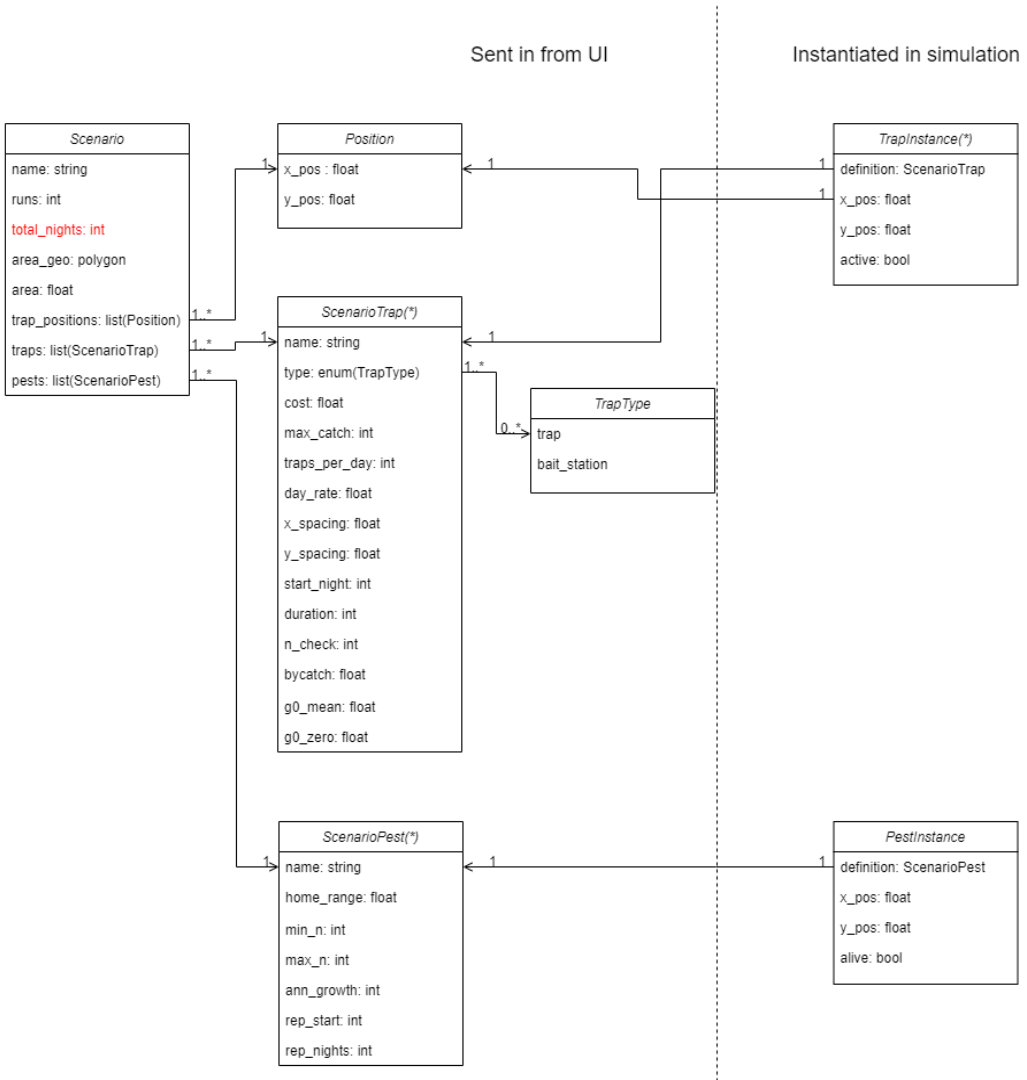
Software Development Process

- Iterative approach
- Continuous cycle



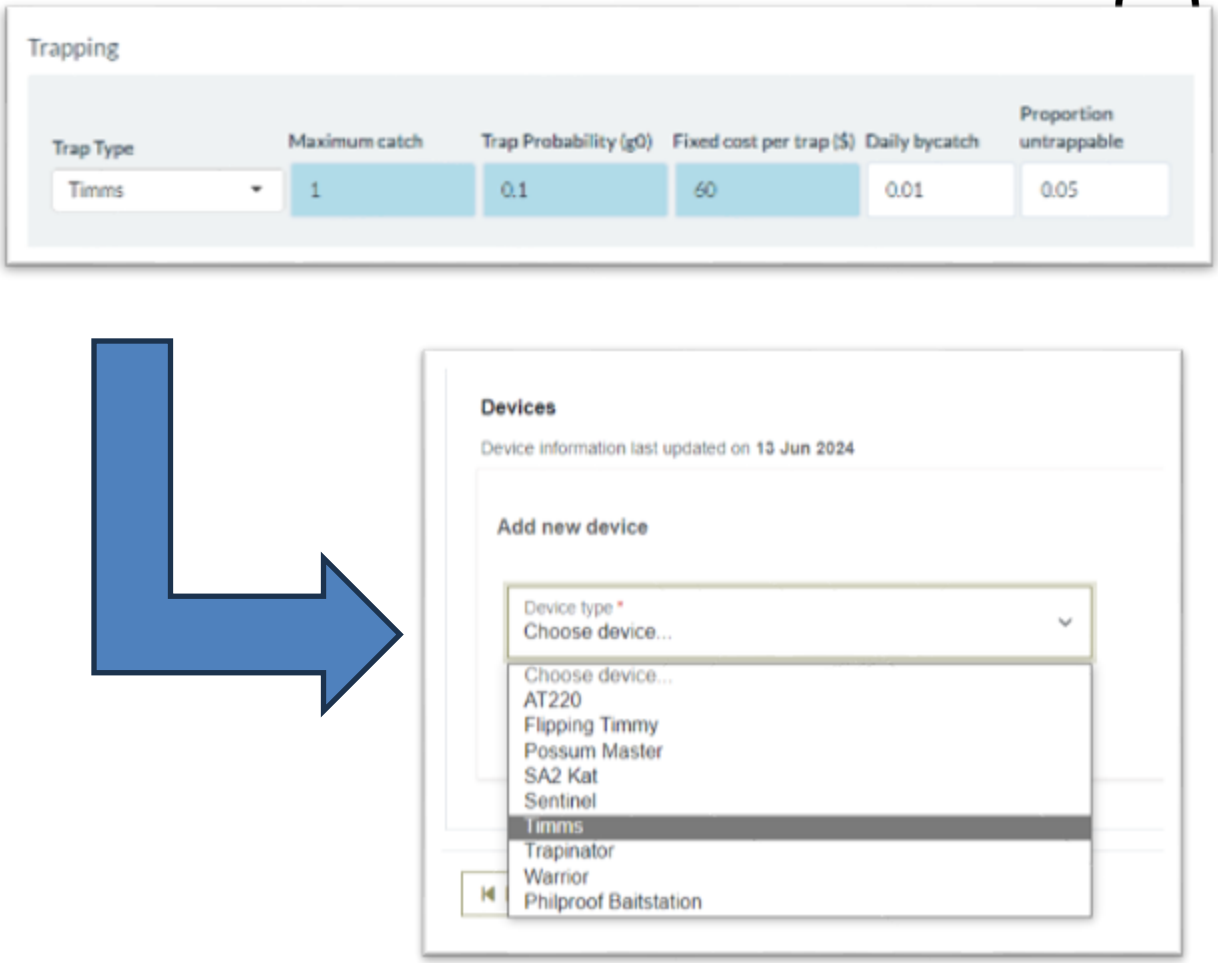


Reworking the Model



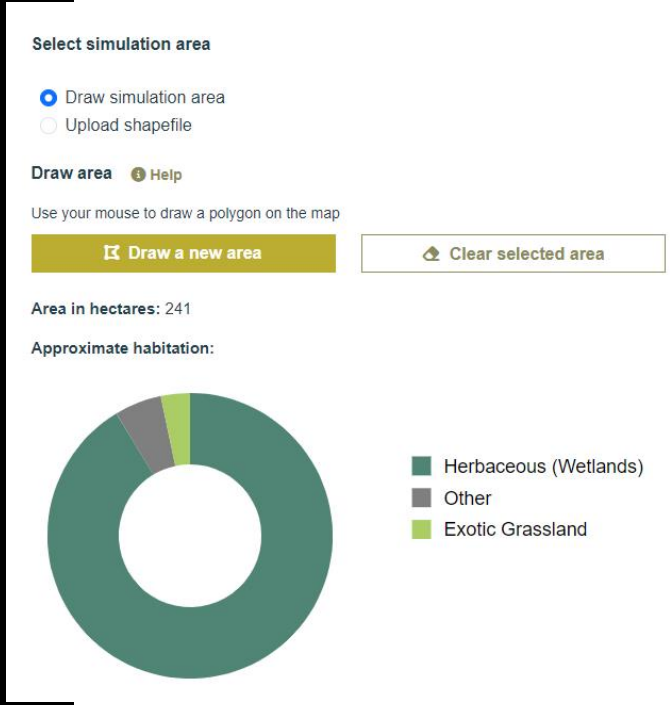
Configurable

- Users might not always be aware of the information they need to provide
- Provide more data in the app to the users based on scientific evidence
- Enable scientists to provide updated data easily without code changes



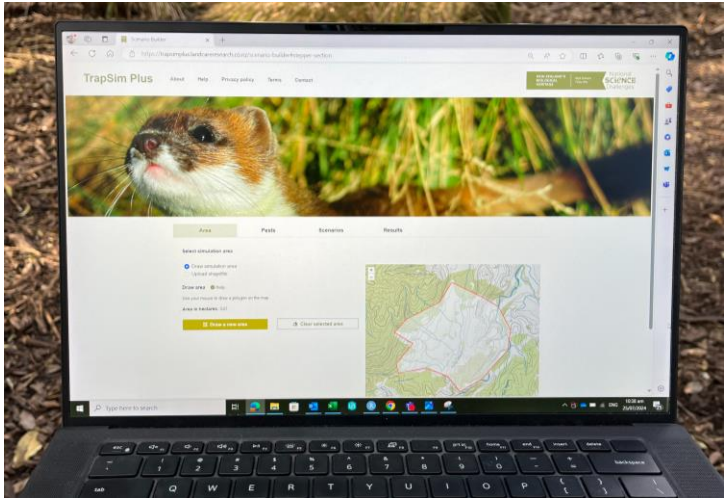
Adding UI improvements

- Draw your trapping area on a map
- Pulling through habitat information to make more accurate population estimates
- Generally making the app "user-friendly"



New Features

- Suitable for six species
- Automatic selection of default parameters: density, carrying-capacity, population growth rates, home range
- Can include immigration
- Device costs, & info on NAWAC status

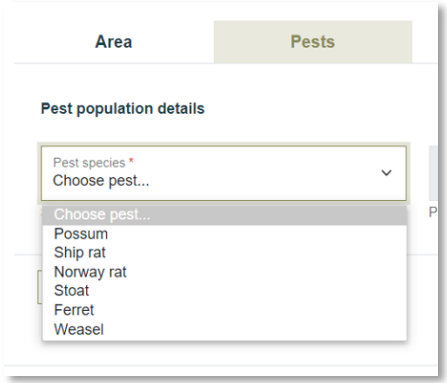


NAWAC guideline table

Y = tested and is humane for that type of pest

NAWAC guideline test status – updated 21 November 2023

Trap	Ship Rat	Norway Rat	Stoat	Ferret
DOC 150		Y	Y	
DOC 200	Y	Y	Y	
DOC 250	Y	Y	Y	Y
BT 200	Y		Y	
BT 250				Y
PodiTRAP				Y
Rewild F-Bomb	Y	Y	Y	Y



Results

- Ballpark estimates of efficacy of control ‘scenarios’
- Rank by cost-effectiveness

Name	Duration (days)	Total devices	Total cost	Population change	Efficiency index	
Scenario 1	31	20	$2700	↓ 83%	7.18	Hide details
Scenario 2	61	10	$1700	↓ 81%	9.1	

Scenario 1

SCENARIO

Area (ha)	Total cost	Start population	End population	Efficiency
194	$2700	35	6	7.18

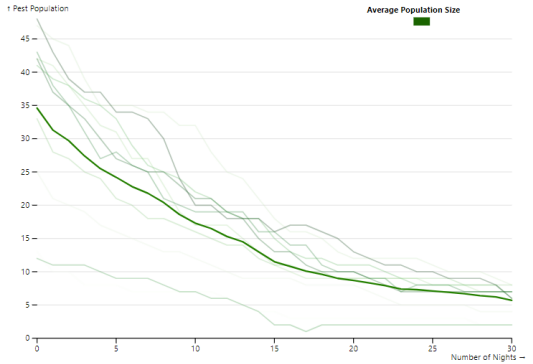
PESTS

Pest type	Min pests	Max pests
Stoat	10	50

DEVICES

Name	NAWAC	Quantity	Total cost
BT200 Double Set	✓	20	$2700

POPULATION OVER TIME



Population changes over time per simulation iteration

Scenario 2

SCENARIO

Area (ha)	Total cost	Start population	End population	Efficiency
194	$1700	26	5	9.1

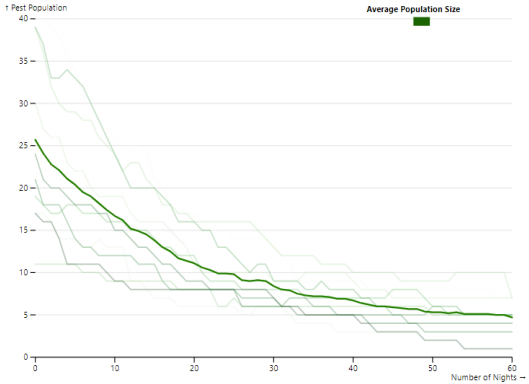
PESTS

Pest type	Min pests	Max pests
Stoat	10	50

DEVICES

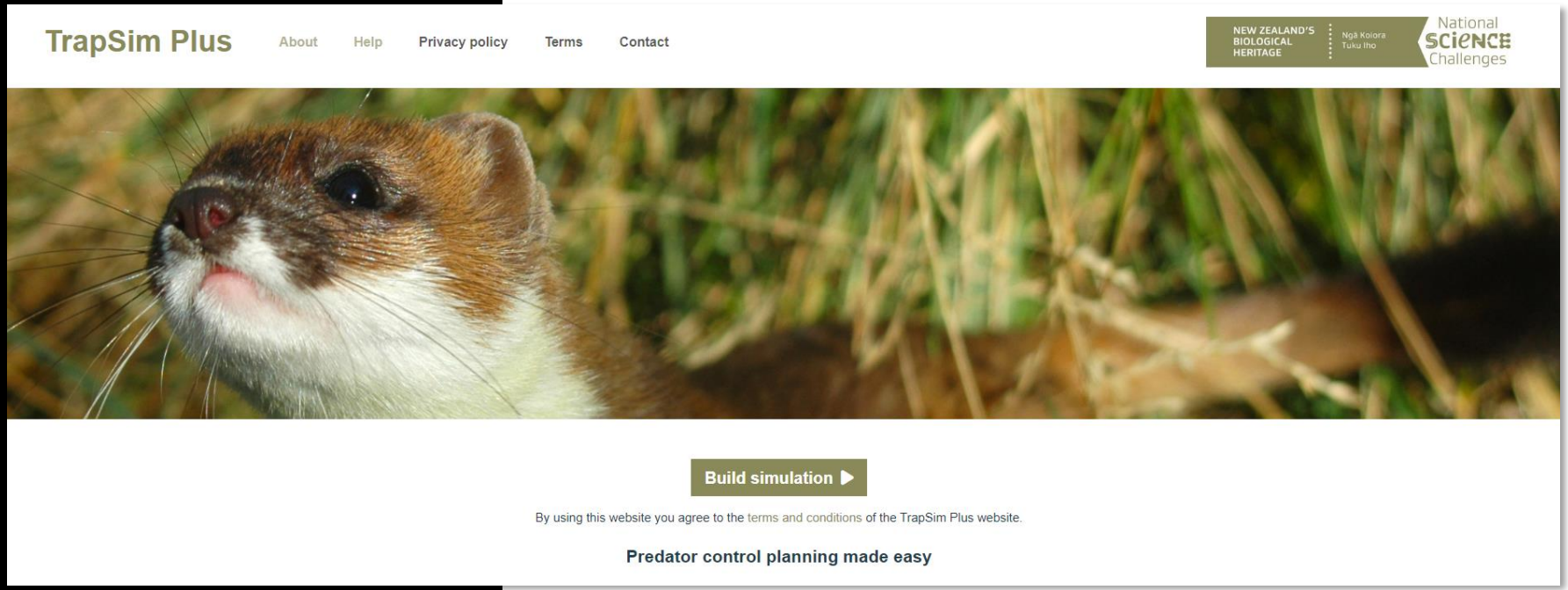
Name	NAWAC	Quantity	Total cost
BT200 Double Set	✓	10	$1700

POPULATION OVER TIME



Population changes over time per simulation iteration

DEMO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Build simulation ▶
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Predator control planning made easy

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- Chris Jones, Nikki Harcourt
- Izzy Busby, Ally Palmer, Kevin Collins

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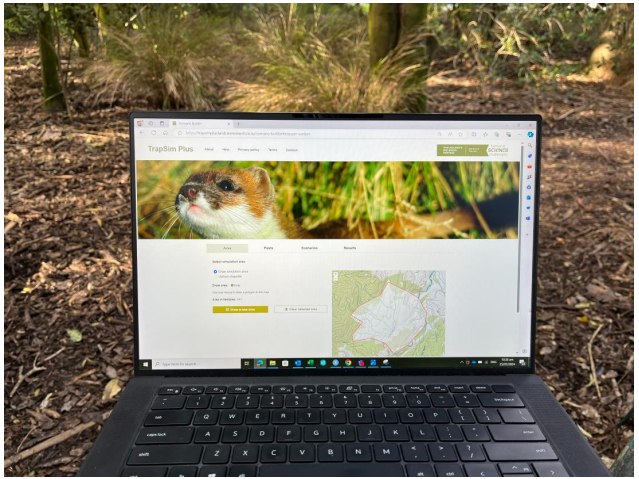

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