

GOODNATURE A24 MECHANICAL RELIABILITY FINAL PROJECT REPORT - MAY 2018



A24 Trap weighing in field

Project Summary

The mechanical reliability project was established within the Harts Hill rat control project (Kids Restore the Kepler) with the objective to measure the gas use and mechanical reliability of a sample of Goodnature A24 self-resetting traps during operational use over the 6 month period between CO₂/ALP service. This report discusses the final three CO₂/ALP changes.

In November 2014 a network of 467 Goodnature A24 rat traps was established over 200 hectares of beech forest at Harts Hill, Kepler Track, Fiordland National Park to control rats during a widely publicised beech mast/rat plague event of that year. The A24 traps successfully reduced the rat population from a pre-treatment rat index of 68% to 0% within twelve weeks and then sustained control of rats for the remainder of the project. 52 of these traps were allocated to the mechanical reliability project. Gas use of each trap was accurately measured at each six month CO₂/ALP service.

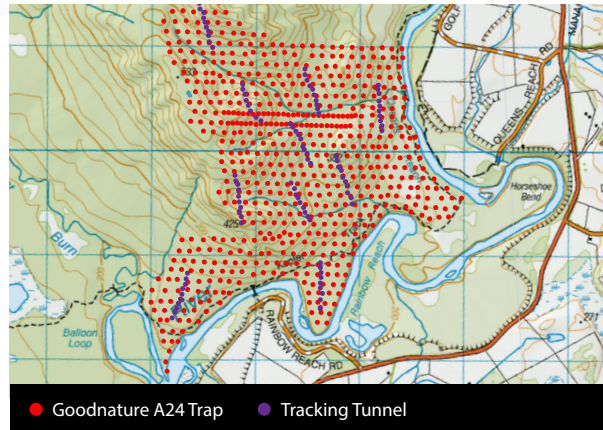
Project Objective

This project was set up to evaluate the CO₂ use and mechanical reliability of the Goodnature A24 self-resetting trap in an operational setting over 6 month periods between CO₂ canister service events.

Project Design

The network at Harts Hill was established using DOC current best practice for ground-based rat control with trap lines 100 m apart with traps at 50 m then 100 m intervals on the lines. Since April 2015 the Harts Hill project grew to 600 ha and 100 m x 100 m spacing's.

Two trap lines (M and N) consisting of 52 traps were allocated to this reliability study.



Harts Hill, Kepler Track

-45.48, 167.67

Dates: Nov 2014 - Nov 2017

Traps: 52 Goodnature A24 rat & stoat traps

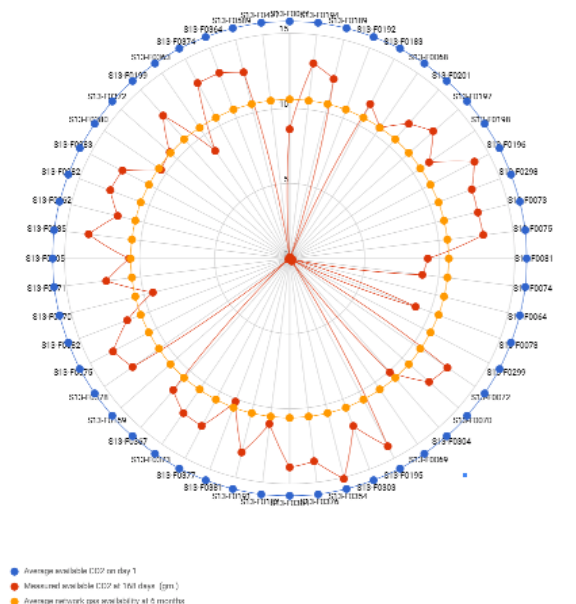
Maintenance Schedule: 6 monthly.

Monitoring Events: Once at each 6 month CO₂ replacement (Traps and gas cylinders weighed).

Monitoring Method: Every trap was weighed to 1/100 of a gram (using a Ohaus digital balance) to establish the remaining CO₂.

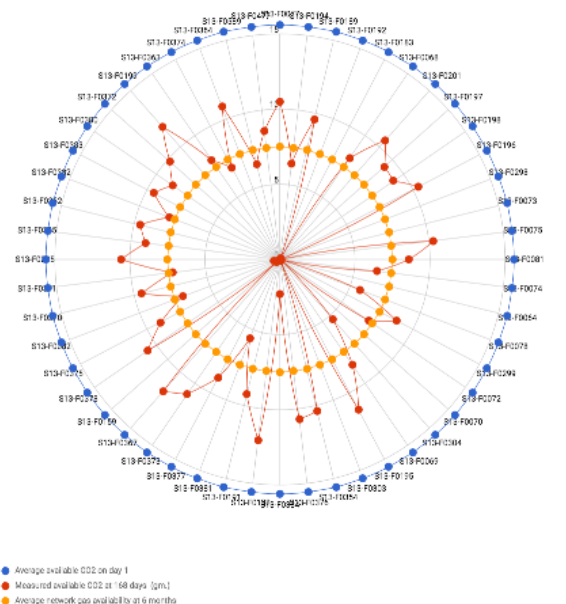
Results - Nov 2016

Harts Hill gas use sample data: Lines M and N. Nov 2016



Results - May 2017

Harts Hill gas use sample data: Lines M and N. May 2017



Average available CO₂ on establishment:

Jun 2016 **15.8 grams**

Average CO₂ remaining at fourth 6 month period:

Nov 2016 **10.6 grams**

Max/min CO₂ remaining at fourth 6 month period:

Min **0.0 grams**

Max **15.4 grams**

NB. A24 average CO₂ use per kill 0.52 grams

Percentage A24s used all available CO₂:

Nov 2016 **11.5%**

Percentage A24s which successfully re-gassed

Nov 2016 **100%**

Average available CO₂ on establishment:

Nov 2016 **15.6 grams**

Average CO₂ remaining at fifth 6 month period:

May 2017 **7.5 grams**

Max/min CO₂ remaining at fifth 6 month period:

Min **0.0 grams**

Max **11.8 grams**

NB. A24 average CO₂ use per kill 0.52 grams

Percentage A24s used all available CO₂:

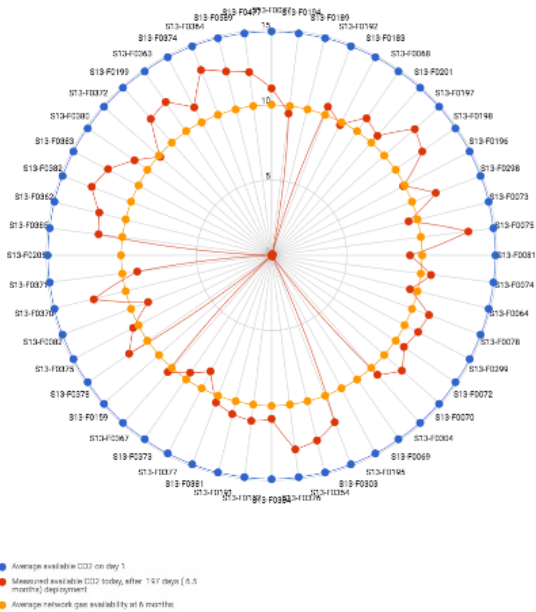
Nov 2016 **11.5%**

Percentage A24s which successfully re-gassed

May 2017 **100%**

Results - Nov 2017

Harts Hill gas use sample data: Lines M and N. Nov 2017



Average available CO2 on establishment:
 May 2017 **14.9 grams**
 Average CO2 remaining at sixth 6 month period:
 Nov 2017 **10 grams**

Max/min CO2 remaining at sixth 6 month period:
 Min **0.0 grams**
 Max **16.5 grams**

NB. A24 average CO2 use per kill 0.52 grams

Percentage A24s used all available CO2:
 Nov 2016 **9.6%**

Percentage A24s which successfully re-gassed
 Nov 2016 **100%**

Highlights/Learnings

The CO2 available in the A24 traps at this trap layout density was enough to reduce a beech mast/plague event population of rats from 68% pre-treatment to 0% and sustain control out to the 6 (May 2015), 12 (Nov 2015), 20 (Jun 2016) and 17 (Nov 2016) month CO2 service events.

As well as reducing the rat population within the project area, other pests including stoats and mice were observed killed by the A24s.

- Rat control over 600 ha consistently effective
- No systematic faults
- Trap availability - minimum was 97.9%
- 2.1% network 'failure' rate
- 8 traps had no gas over 3 1/2 years at the 6 month service events.
- The 8 traps were removed for diagnosis.

References

www.goodnature.co.nz

Goodnature A24 rat & stoat trap

Goodnature A24 Mechanical Reliability Project
Report DOCCM-2562029

Goodnature A24 Mechanical Reliability Project
Report 2 DOCCM-2800562

Goodnature A24 Mechanical Reliability Project
Report 3 DOCCM-2800564

Rat Control (100m x 50m) Harts Hill -
Fiordland Project Report DOCCM-2562031

Rat Control (100m x 100m) Harts Hill -
Fiordland Project Report DOCCM-2582594

Acknowledgements

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