

# Management of Kauri Dieback



**AUCKLAND CONVERSATIONS**

A series of international speaker events on the issues facing Auckland to become the world's most liveable city proudly brought to you by Auckland Council.

**KEEP KAURI STANDING**

STOP KAURI DIEBACK DISEASE SPREADING [WWW.KAURIDIEBACK.CO.NZ](http://WWW.KAURIDIEBACK.CO.NZ)



# Overview

- What is kauri dieback
- Where is kauri dieback
  - How does it spread
- Adaptive management
  - How do we contain kauri dieback
  - Protection of healthy kauri
  - Control tools?
- **More information, science, public awareness, programmes, how you can help?**

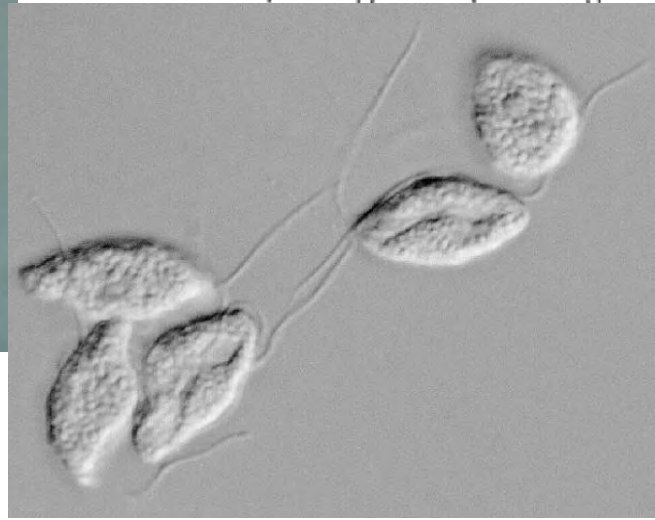
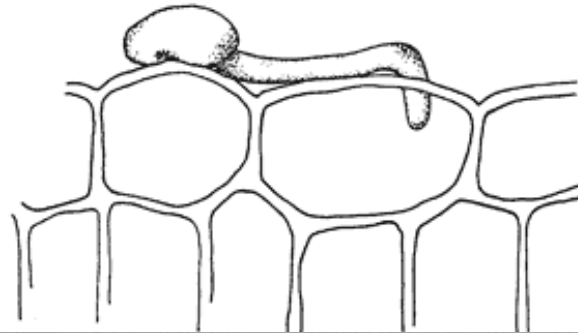
[www.kauridieback.co](http://www.kauridieback.co)



# What is Kauri dieback?

*Phytophthora* 'taxon agathis' = *PTA*

- a causal disease agent of Kauri dieback
- infects kauri tree roots
- virulent primary kauri pathogen





# *Phytophthora* a 'fungus-like' microorganism

- *Phytophthora* = “Plant Destroyer” (Greek)
- A distinct taxa known as the ‘water moulds’
- Parasitic water moulds include diseases of fish & plants

**Water moulds  
(OOMYCETES)**

**ANIMALS**

**GREEN  
PLANTS**

**FUNGI**

**RED  
PLANTS**



# Kauri dieback – what does it look like?

- kauri root rot
- below-ground kills fine feeder & structural roots





# Kauri root health & tree nutrition

- kauri fine feeder roots grow nodules that contain beneficial symbiotic mycorrhizal fungi
- symbiosis enables kauri to competitively obtain water & nutrients -
- kauri dieback destroys this system, tree's nutrition stopped





# *Kauri dieback - symptoms*

- *bleeding lesions at base of trunk*
  - mode of action, ringbarks trees





# *Kauri dieback symptoms*



- defoliation, yellowing, thinning, dead branches, stag heads





# tree canopy decline



kauri tree health score canopy decline 1 -5





Sudden tree collapse (death)



# PTA infects kauri trees of all ages / size classes

seedlings & saplings



‘rickers’ young trees (successional forest)

Long lived ancient trees

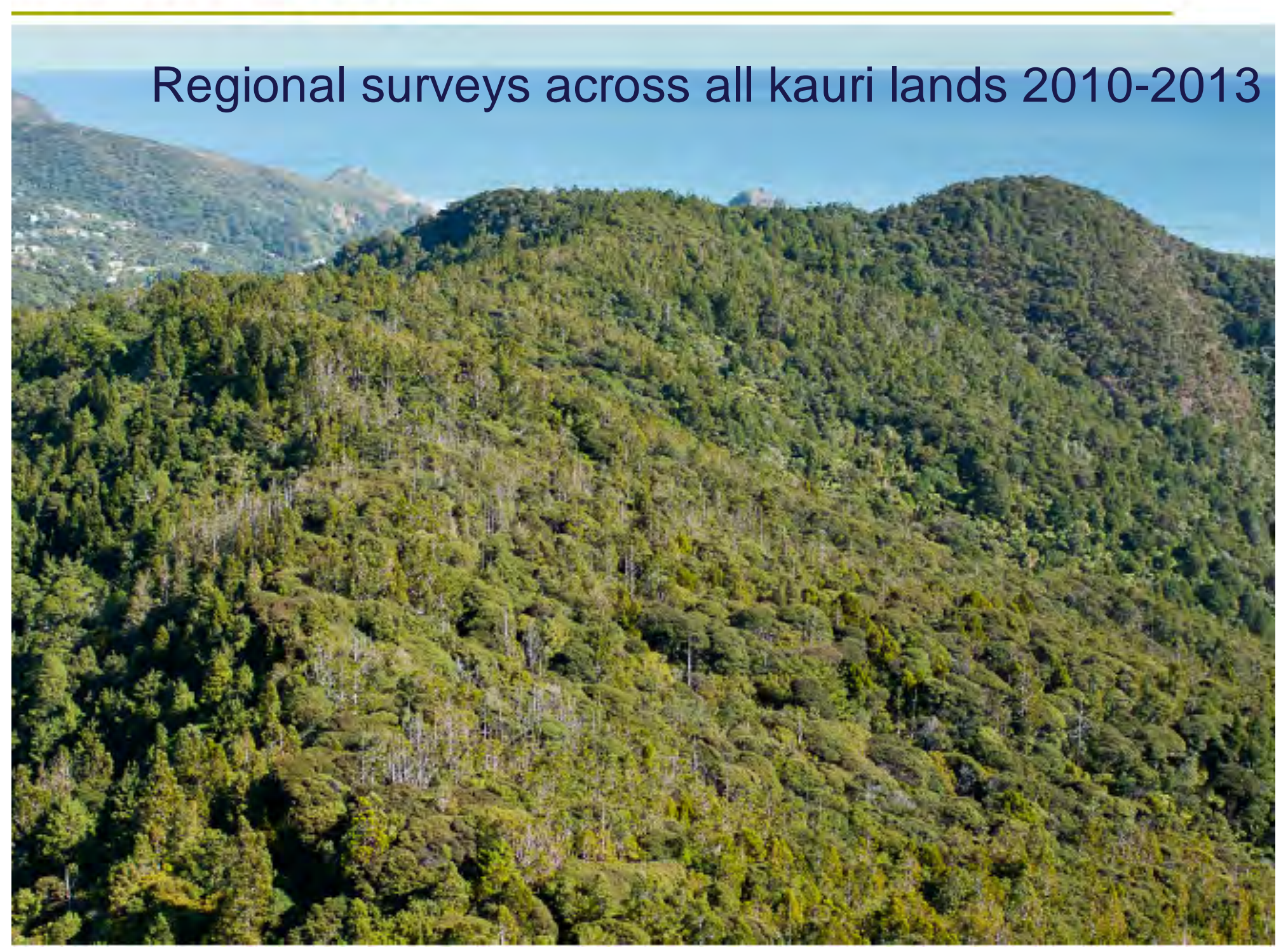


2008: PTA declared an unwanted pest & management initiated





# Regional surveys across all kauri lands 2010-2013







# Kauri dieback national distribution map 2012

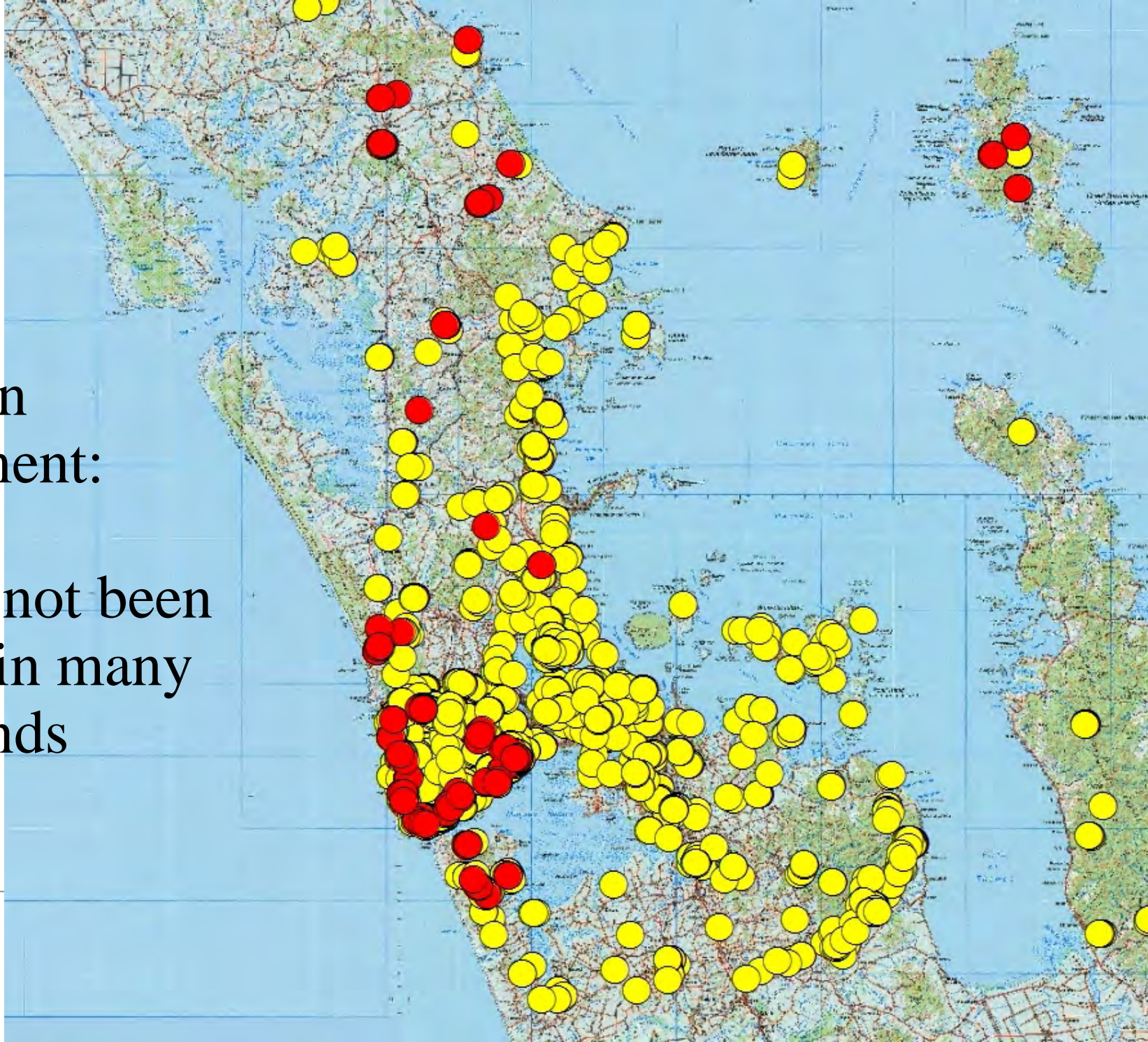
PTA – kauri dieback

● positive    ● undetected



Protection  
management:

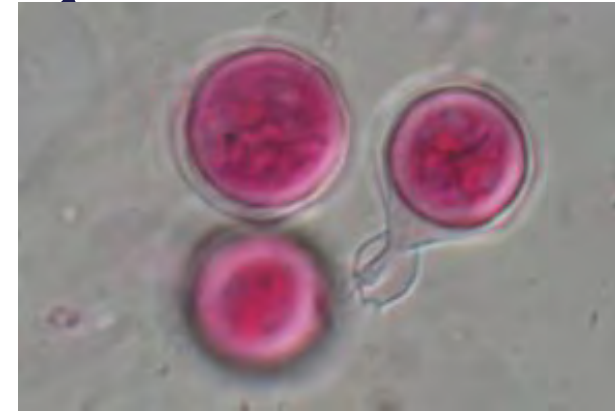
PTA has not been  
detected in many  
kauri stands





# *Kauri dieback - How is it spread?*

- PTA is a soil & water borne disease
  - soil disturbance by human activities
  - animals e.g. pigs / deer / livestock
  - streams (waterborne motile zoospores)
- management objective to stop this spread





# Kauri dieback - soilborne

- *Spores produced in soil around tree roots*
  - *survive longer periods in soil (4+ years)*
  - *and on dirty shoes and equipment*





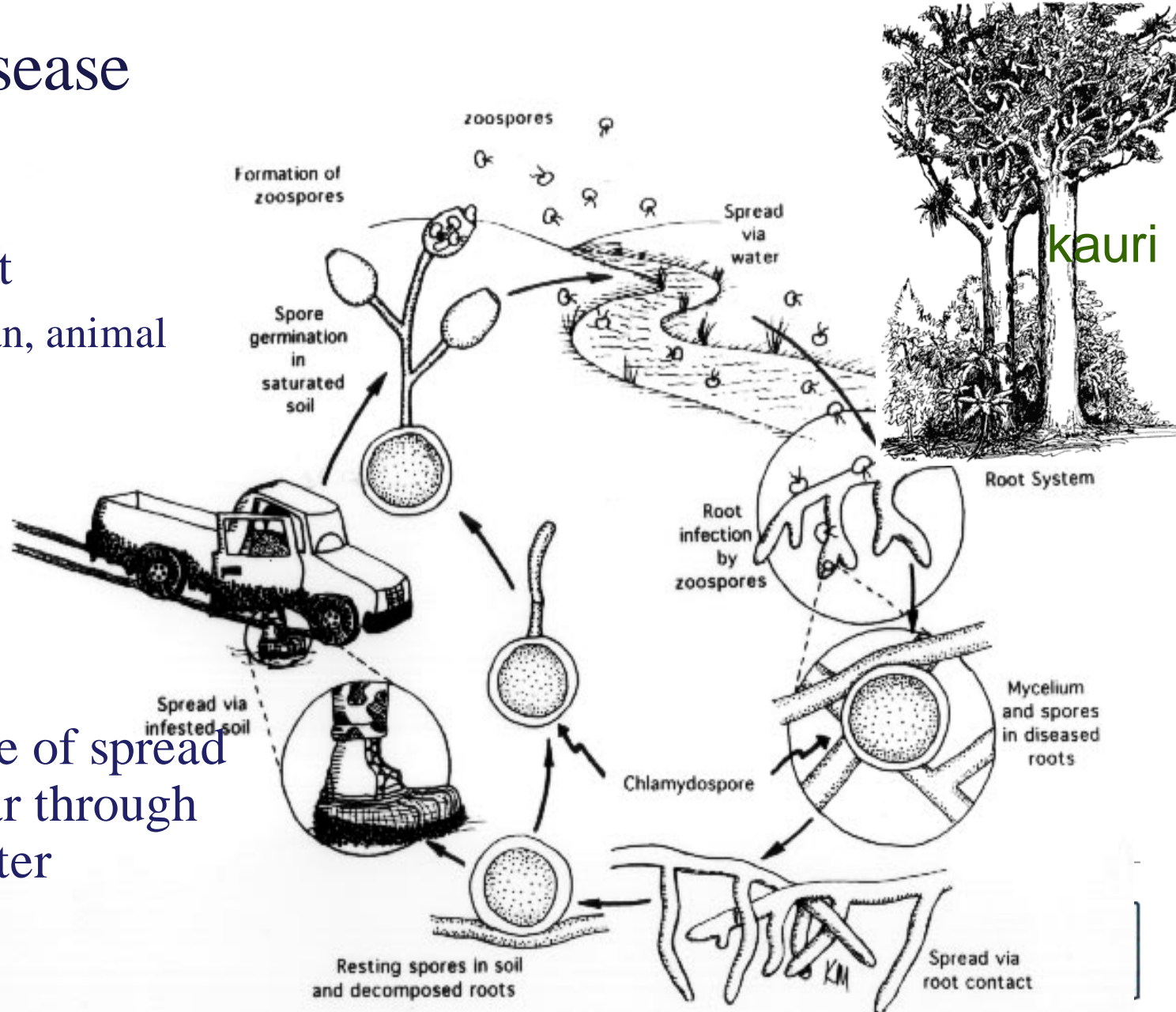
# Kauri dieback– life cycle, how is it spread?

soilborne disease

Soil movement

Vectors human, animal

Non vector rate of spread  
= up to 3m/year through  
natural soil water  
transmission





# Kauri dieback management programme

Contain, reduce, stop soilborne spread  
Protect healthy forest

Control and treat kauri dieback  
Restore kauri root and soil health

Raise awareness to assist these measures

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# Key public messages to achieve outcomes

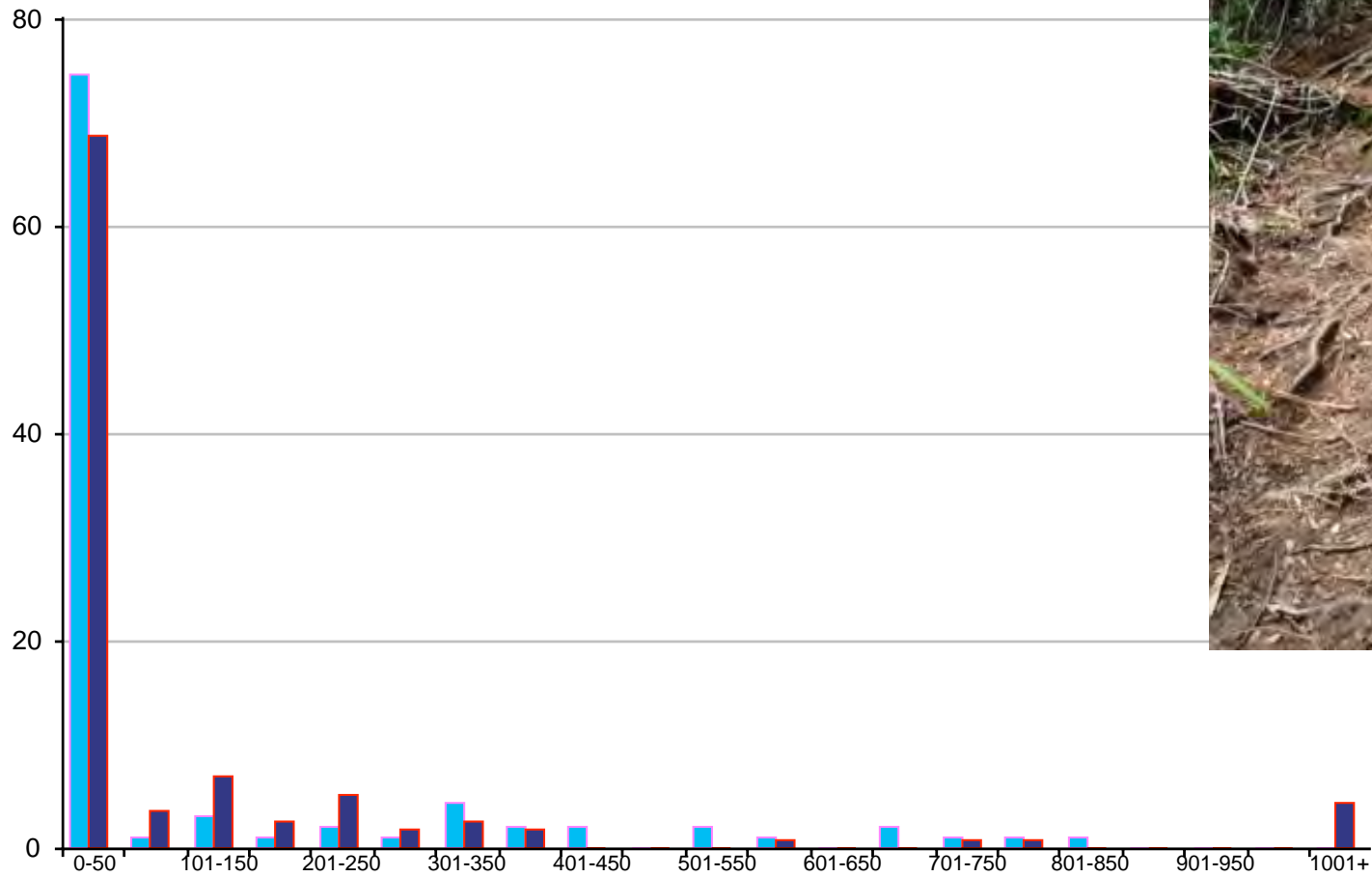
- **Stop soil movement**

- “Clean in Clean out” – when visiting a kauri forest arrive with clean footwear, clean again when you get home
- Clean equipment/tyres/vehicles
- Use cleaning stations
- Keep to tracks
- Stay off kauri roots



# 68% kauri dieback zones are on/or close proximity to tracks (0-50 m)

Proximity of kauri dieback zones to the track network







Measures to contain kauri dieback spread along tracks



# Management – public reserves



cleaning stations installed  
at parks

contain PTA spread along  
tracks & protect  
“unaffected/healthy”  
areas

Phytosanitary (barrel & grate) station



# Kauri dieback education – 'Clean your footwear' key message public and recreational events with large mat cleaning stations





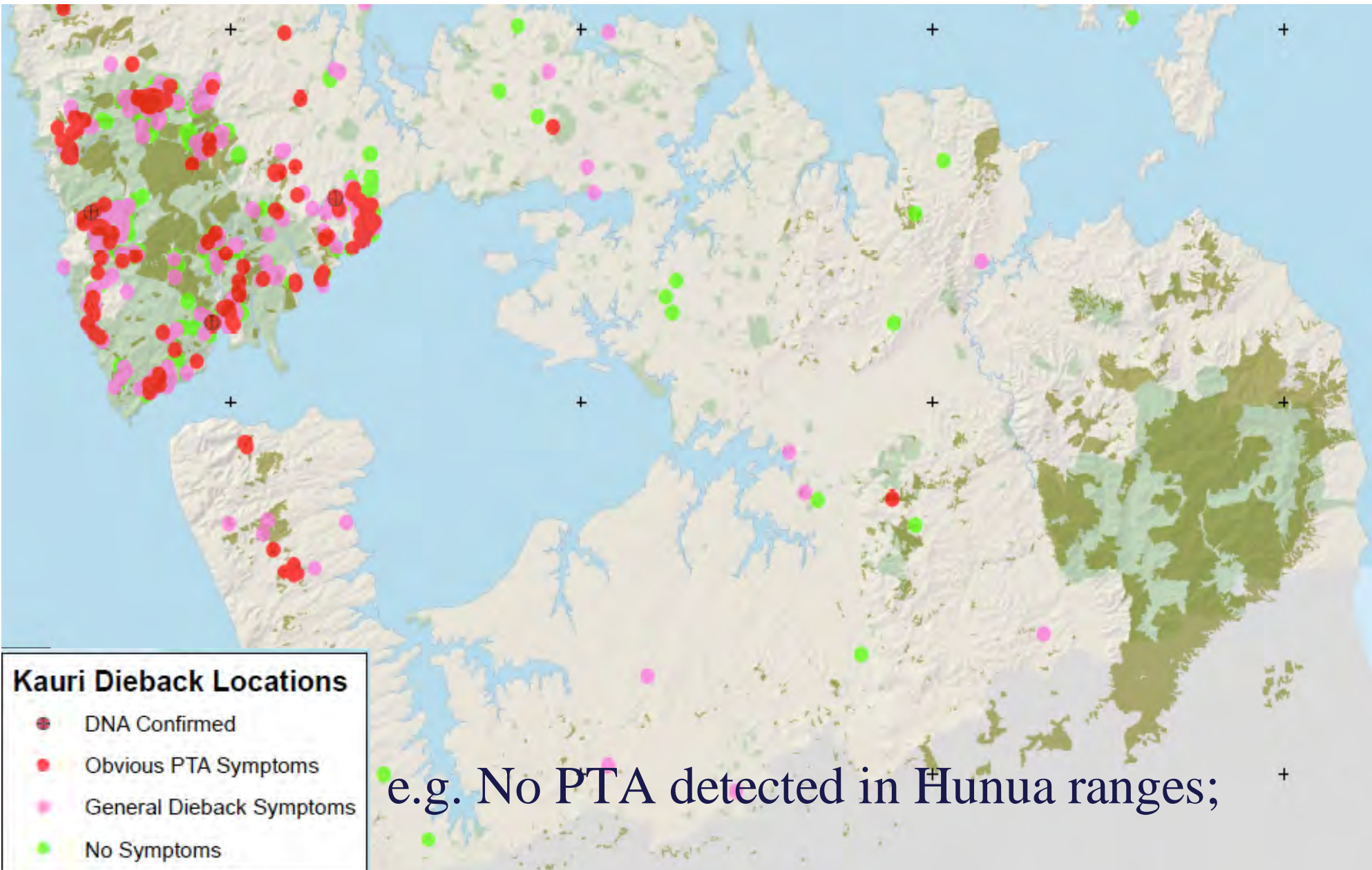
# Management of kauri dieback on open tracks re-routing, upgrading, boardwalks, temp closures

e.g. boardwalks increases kauri root protection and reduces disease transfer





# Management : Protection of healthy kauri





# Kauri protection zones 2012

- A review of the Waitakere/Hunua Ranges identified areas where Kauri were healthy & PTA undected
- Working on ‘prevention is better than cure’ the focus has been put on protecting the tree’s in these areas.
- e.g Hunua & Waitakere protection areas
- 14 tracks (27 km) in the Waitakere Ranges leading into these areas were closed to public access from July 1st 2012 .
- This will be monitored to measure effectiveness



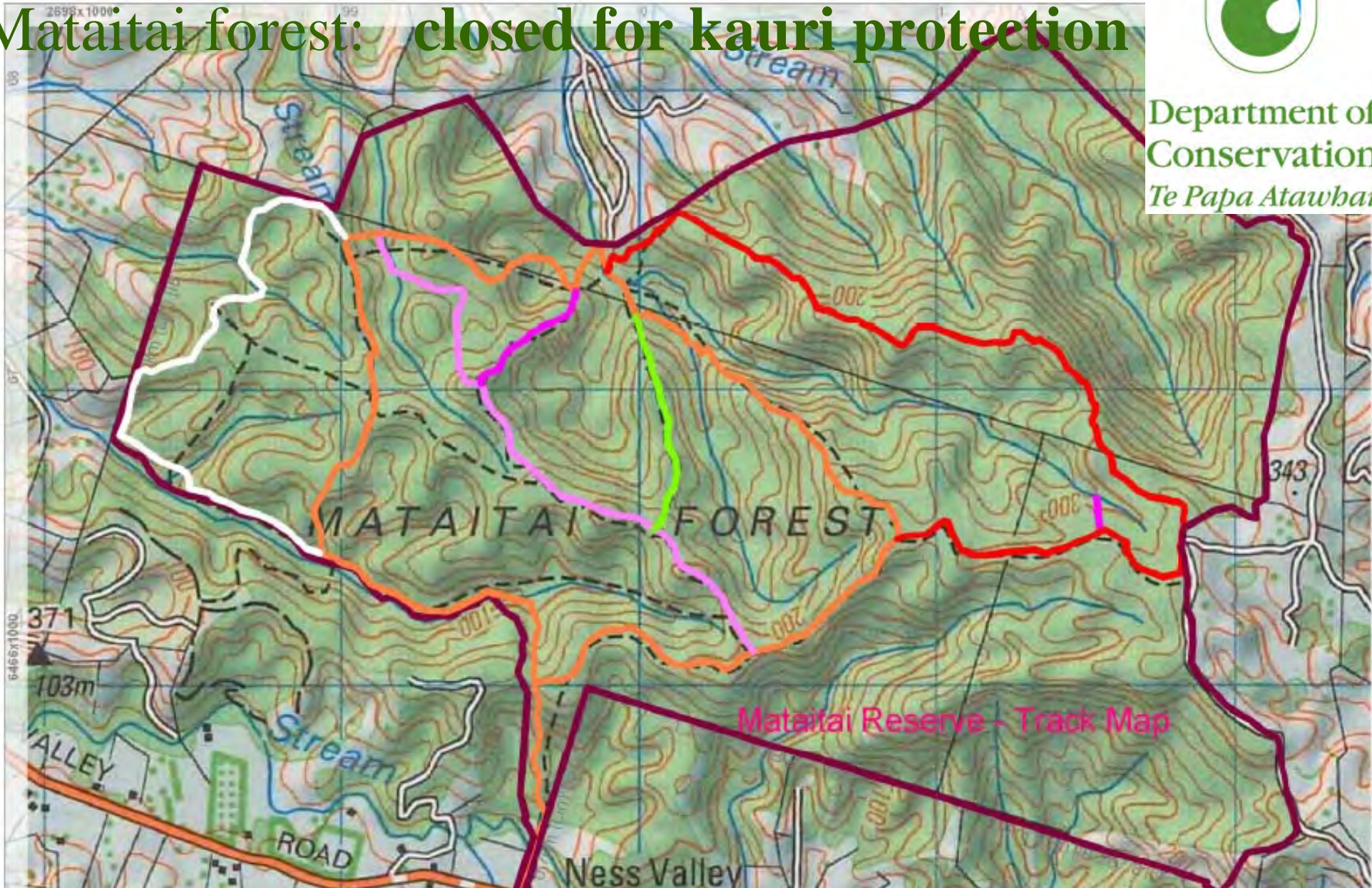




# Mataitai forest: closed for kauri protection



Department of  
Conservation  
*Te Papa Atawhai*



**The department has closed the 680 hectare reserve for 5 years, contains healthy large trophy kauri trees more than 800 years old.**



kauri protection

raise awareness

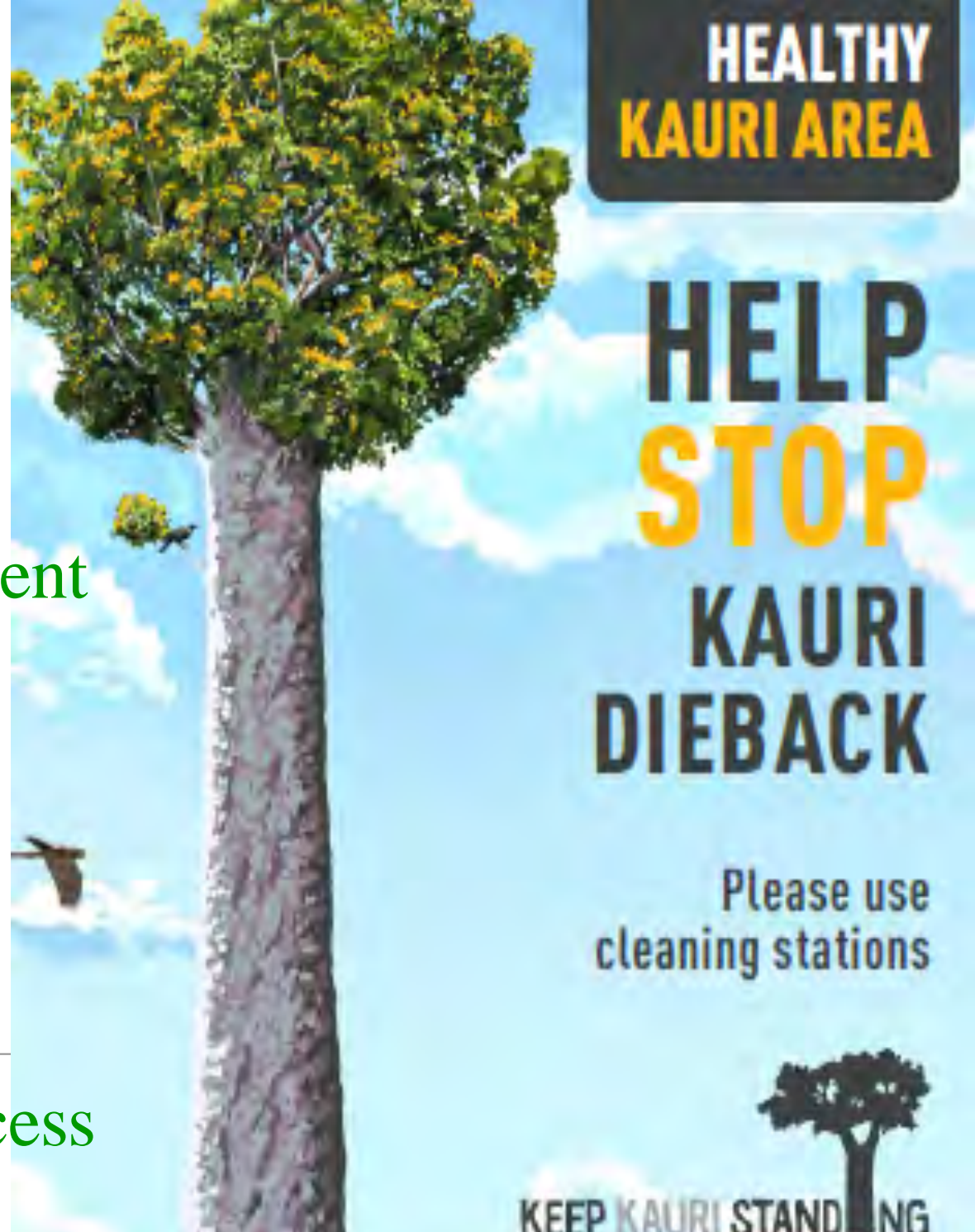
increase management

track closures

protection areas

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Rahui / restrict access





# Vector management

Vector control

Feral pig control underway

other vectors of PTA spread unknown

further research required





# Biosecurity guidelines for planting & propagation

- kauri plants -- ecosource local kauri from disease free trees/stands
- planting equipment & nursery hygiene important
- report any sick dead kauri seedlings/plants
- No movement of kauri plants inter-regionally –





# Can we control kauri dieback? Treatment trials underway





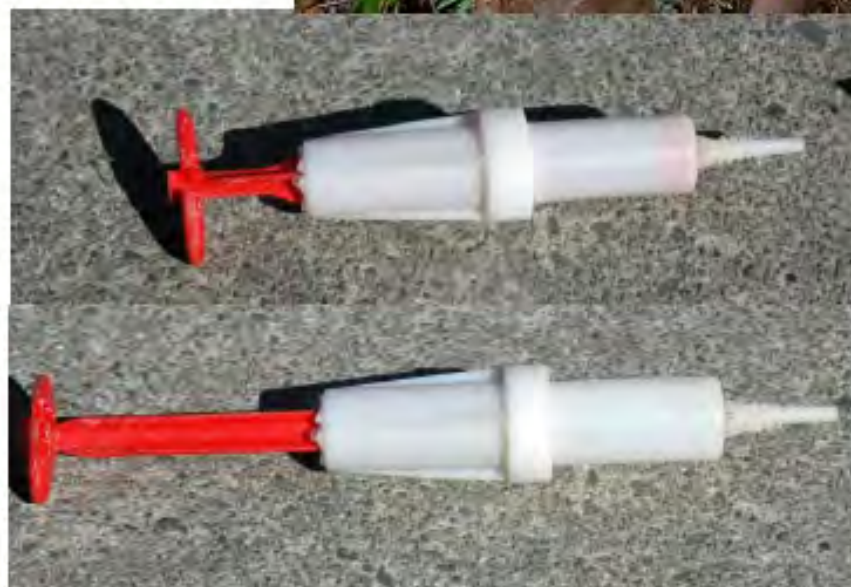
# Field trials: Treatments

## Phosphite injections

(20 ml every 20 cm)

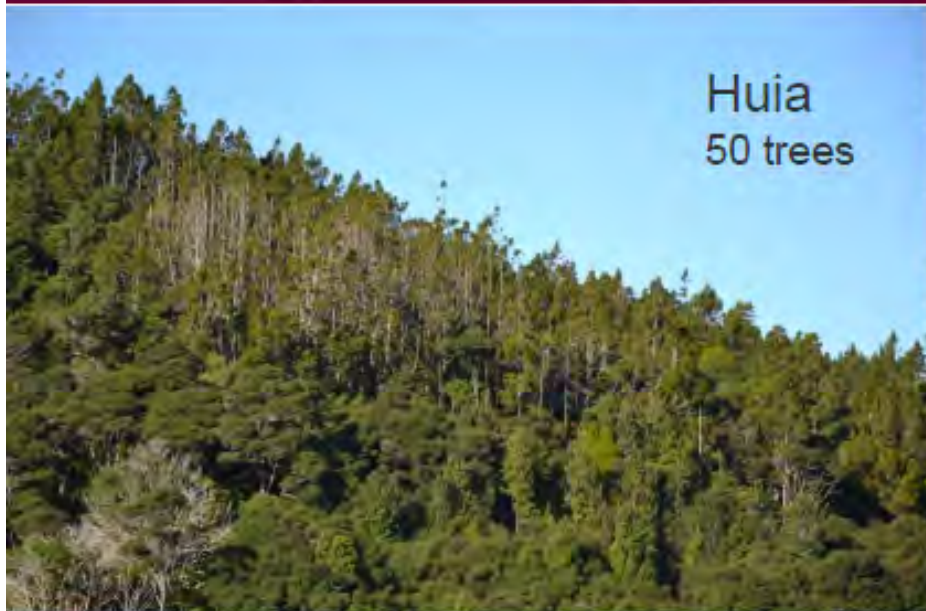
- 20% solution – annual
- 20% solution – biennial
- 7.5% solution – annual
- 7.5% solution – biennial

## Untreated control





# Field trials: sites



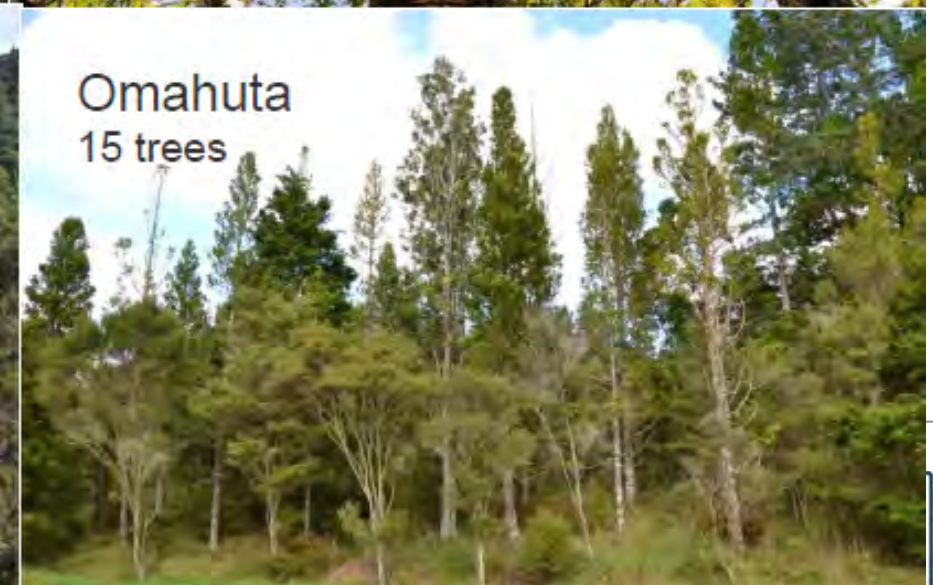
Huia  
50 trees



Whatipu  
55 trees



Raetea  
42 trees



Omahuta  
15 trees



# Treatment trials – biological options

- e.g. physical aeration & soil inoculation to improve drainage and root health/growth – *Biostart & Turf Aeration*





# How can the public help?

*You can still visit parkland with Kauri forest – but please take care!”*

- Key messages;
  - Keep to the tracks
  - Dogs on leash
  - Use the cleaning stations provided
  - Always clean shoes, tyres, equipment **before/after** leaving a kauri stand
  - Spread the word to others we have a serious problem

- [www.kauridieback.co.nz](http://www.kauridieback.co.nz)



- <https://www.facebook.com/TheKauriDiebackManagementProgramme>



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