Management of Kauri Dieback

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.
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.
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
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
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)
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

- No PTA detected in Hunua ranges;
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
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

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

• https://www.facebook.com/TheKauriDiebackManagementProgramme

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