



PROTECTING KAURI: A RURAL LANDOWNER'S GUIDE

Preventing the spread of kauri dieback
on rural properties



This guide is for farmers and rural landowners who have kauri on or near their property.

Kauri need protection from kauri dieback disease, which is caused by a microscopic soil-borne organism called *Phytophthora agathidicida* (PA). It is spread through the movement of contaminated soil, and, in most cases, once a tree is infected it will die prematurely. There is no known cure for kauri dieback, therefore the best way to protect kauri is by stopping the spread.

There are a number of activities and items that pose a high risk of moving soil in and around kauri areas in rural environments. This document will provide best practice information for protecting kauri within the rural landscape.

**STOPPING SOIL
MOVEMENT AROUND
KAURI IS THE BEST
WAY TO PROTECT KAURI.**

Authors: Kathryn O'Toole and Kim Parker, Waikato Regional Council

Prepared for: The Kauri Dieback National Programme

Endorsed by: Travis Ashcroft , Ministry for Primary Industries

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Disclaimer

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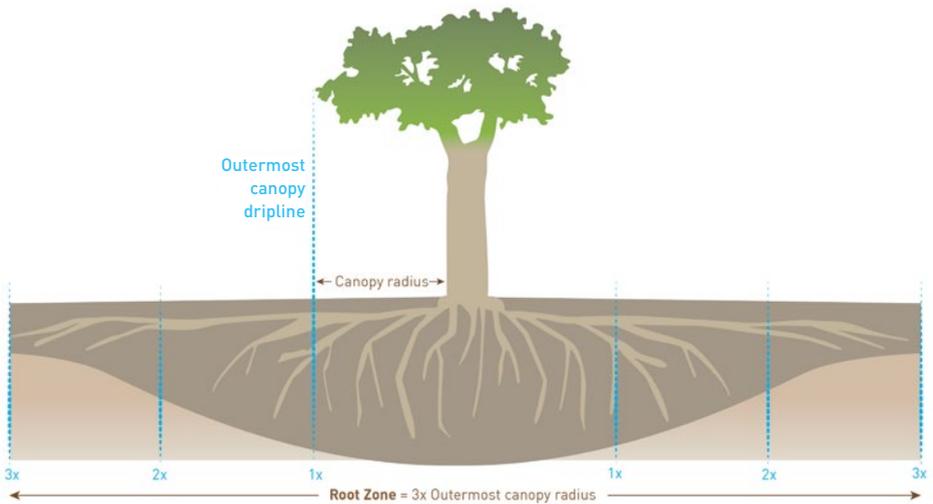
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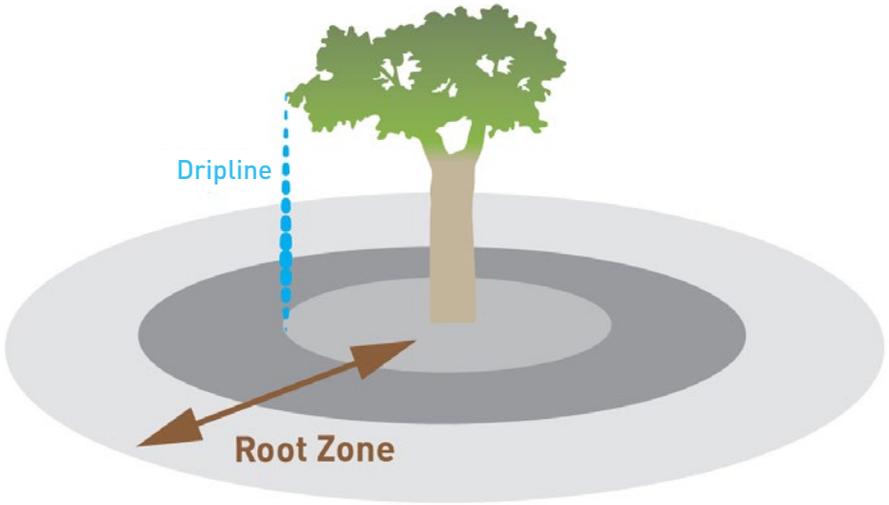
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KAURI ROOT ZONE

The kauri root zone is defined as three times the radius of the outermost canopy dripline, where the tree produces a network of feeder roots through the litter and soil surface.

Note: as the kauri canopy extends with age, the canopy dripline also extends.





KAURI ON YOUR PROPERTY?

Kauri dieback hygiene guidelines should be followed to manage risks and potential pathways of spread.

If you have kauri on your property, the following key actions apply.

1. Avoid kauri areas whenever possible.
2. Arrive clean and leave clean (clean to soil-free before and after being near kauri).
3. Disinfect once soil-free (use disinfectant like Sterigene following removal of all visible soil).



PEOPLE

People and their equipment/machinery have the potential to move large amounts of soil through or between kauri areas.

Ensure that everyone (including all visitors and contractors) who may go close to kauri areas on your property removes all soil from footwear, clothing, gear, bikes, machinery and dogs.

✓ Actions

- Arrive clean, leave clean. Clean all footwear, clothing and gear to soil-free and then disinfect when moving into, out of or between kauri areas.
- Avoid kauri areas as much as possible.
- If you must work near kauri, work in dry conditions, as it is much easier to manage soil movement in dry conditions.
- Undertake activities outside of the kauri root zone.
- Use property specific footwear and clothing.
- Ensure all visitors (including vets, farm advisors, contractors, hunters, tourists and friends) arrive soil-free and follow kauri dieback hygiene requirements if visiting kauri areas on or near your property.
- Hunters should also refer to the Kauri Dieback Programme's **Hunting Guideline**.



The shoes on the right are how soil-free shoes should look.

VEHICLES AND MACHINERY

Vehicles and machinery potentially carry and move soil between kauri areas. Their use may also affect the health of kauri by compacting and disturbing soil or damaging kauri roots.

✓ Actions

- Keep vehicles and machinery outside of kauri root zones (consider walking rather than using a vehicle and risk parking inside a root zone).
- If vehicles or machinery must be used within a kauri root zone, clean them of all soil, then disinfect at a wash-down area before and after operating in that kauri area.
- Avoid all unnecessary vehicle and machinery use around kauri and kauri areas in general. If an activity is necessary, then undertake hygiene measures prior to use.
 - Avoid using machinery that has been used in other kauri areas or ensure that it is cleaned to soil-free and disinfected before and after working in kauri areas.
 - Use vehicles or machinery that are easier to clean, e.g. rubber tyres rather than tracks.
 - Consider leaving machinery onsite for the duration of any works in or near kauri areas to reduce soil movement.
 - Establish wash-down area(s) on site or find an appropriate offsite facility (always ensuring that all loose soil and debris is removed from any vehicle or machinery at the kauri site prior to moving away).
 - Designate a single entry and exit point.
- In all cases, in kauri areas:
 - only do works in dry conditions, as this reduces the amount of soil moved
 - avoid driving or operating in the kauri root zone
 - keep to formed tracks and roads. Do not drive in kauri areas.

For further details on the requirements of wash-down sites and hygiene procedures for vehicles and machinery refer to the Kauri Dieback Programme's **Vehicle and Heavy Machinery Hygiene Guideline**.

STOCK

Stock and farm animals pose a high risk of carrying potentially contaminated soil on their hooves and coats through:

- stock movement within the farm
- stock movement between farms.

✓ Actions

- Keep stock out of kauri areas.
 - Ensure fencing around kauri areas is well maintained and able to keep all stock out.
 - Make sure new stock to a property, or stock moving from a property, are cleaned to soil-free, preferably within a cowshed hose-down facility if available.



FERAL ANIMALS

Feral animals can carry contaminated soil and can move large distances. Therefore, controlling feral animals in kauri areas is important. Additionally, feral pig rooting causes significant damage to kauri root systems and overall forest health.

✓ Actions

- Control feral animals (e.g. feral pigs, goats and deer).
- Make sure people trapping or hunting on your property reduce soil movement by:
 - cleaning all footwear and gear prior to and following use
 - staying out of kauri root zones
 - sticking to established tracks as much as possible
 - avoiding placing traps on or near kauri
 - disposing of dead animals away from kauri root zones.
- Refer to the Kauri Dieback Programme's **Hunting and Trapping Guidelines**.



FENCES, TRACKS AND STRUCTURES

While fencing off kauri areas enhances their protection, the construction and maintenance of fences, tracks and structures involves the movement of soil.

✓ Actions

- Do not transport any soil or organic material into or from kauri areas. Dispose of excavated materials either in situ or at an approved landfill site (refer to the Kauri Dieback Programme's **Landfill Disposal of Contaminated Material Guideline**).
- When introducing new aggregates (e.g. gravel, limestone or metal for tracks and roads), consider sourcing these from a quarry that follows the Kauri Dieback Programme's **Quarry Hygiene Guideline** or one that is not located in or near kauri areas.
- Build new fences outside the kauri root zone. Include as much of the kauri area as possible within the fenced off area. After fencing, consider planting appropriate native species to buffer and further protect the kauri (e.g. mānuka, kānuka, māpou, mingimingi (refer to restoration planting on page 13) but avoid planting directly into the kauri root zone.
- For any construction and maintenance of buildings, tracks, roads and landing areas (forestry) in or near kauri:
 - place these out of kauri areas and away from kauri root zones
 - minimise the area of disturbance, e.g. the width of any verge and the amount of soil movement/excavation.
- Put tracks and roads downslope of kauri rather than upslope where possible.



WEED CONTROL, PRUNING OR REMOVAL OF VEGETATION

Any vegetation pruned in or removed from a kauri area should be considered as potentially contaminated or at high risk of vectoring potentially contaminated soil.

✓ Actions

- Leave all materials from kauri areas in situ or dispose of it at a landfill site.
 - Note: permits are required under section 52/53 of the Biosecurity Act 1993 for the movement or disposal of any pruned or weeded vegetation from a PA contaminated site. Disposal of any PA contaminated or potentially contaminated material away from the site should only be done at an approved landfill facility (one that meets the criteria outlined in the Kauri Dieback Programme's **Landfill Disposal of Contaminated Material Guideline**).
- Use low impact vegetation control methods near kauri and avoid kauri root zones.
 - Use methods that do not disturb the soil, such as mowing or slashing, rather than digging or grubbing.



RESTORATION PLANTING

Planting into kauri areas involves risk through the movement of soil/potting mix and plant material.

✓ Actions

- Obtain plants from a reputable source.
 - New Zealand Plant Producers Incorporated (NZPPI) is the industry body for plant producers in New Zealand. They are producing a Plant Production Biosecurity Scheme that includes measures to protect kauri propagation from PA and other non-kauri plants from other plant diseases. Sourcing plants from suppliers and nurseries participating in the scheme is advised. Additional advice can be sought from NZPPI: office@nzppi.co.nz or www.nzppi.co.nz.
- Do not source plants from areas where there is known kauri dieback infection.
- Only plant outside the kauri root zone, using native plants appropriate for the site.

Consult your local council, local native plant nursery, Department of Conservation office or their websites for more information on appropriate plants to use.



FORESTRY OPERATIONS

Movement of contaminated soil via vehicles and personnel are key risks of forestry operations in or near kauri areas at all stages of operations (planning, construction of roads and landings, planting, tending and harvesting).

✓ Actions

- Arrive clean, leave clean: clean all vehicles, machinery, equipment, footwear and clothing to soil-free, then disinfect at a wash-down area prior to and after operating in/near kauri areas.
- Avoid using machinery and equipment that has been used within other kauri areas – especially any areas of confirmed PA infection.
- Avoid siting and construction of roads or landings, or undertaking planting or harvesting activities, within the kauri root zone or upslope of any kauri.
- Set up operating zones. Have only clean machinery on site and operate with the highest hygiene standards, planning and actions when working in an operating zone with or near kauri, or that has confirmed PA presence. Establish a boundary between kauri/non-kauri operating zones, e.g. using log barriers to mark the exact zones.



HYGIENE TO PROTECT KAURI

Kauri dieback prevention actions aim to stop the movement of PA contaminated soil and organic materials through human and animal activities.

Sometimes a kauri tree may be infected with PA without showing any symptoms (like leaf yellowing, thinning canopy, or gum bleeding), making it hard to know whether PA is present. With this uncertainty, a precautionary approach to hygiene planning and management should always be taken in all kauri areas.

Scrub to soil-free then disinfect

The disinfectant Sterigene is recommended for use in relation to PA (at 2 per cent; 20ml per 1 litre of water). It is broad-spectrum and highly effective at killing three of the four PA life stages, causes minimal environmental impacts, and is less corrosive and non-bleaching compared with effective alternatives like Virkon®, Janola® bleach and methylated spirits¹, although these alternatives are okay for small-scale disinfectant treatments.

The following two-step hygiene process is recommended in all kauri areas.

1. Before visiting, between kauri areas and after leaving, clean all footwear, equipment, vehicles and machinery, etc, to soil-free.
2. Spray to disinfect with Sterigene solution. Allow the disinfectant to dry after application.



Hygiene kits

Keep a hygiene kit in your ute, quad, tractor, truck, helicopter or saddle bag to clean footwear, hooves, bike tyres, small tools and equipment to soil-free if you have been in kauri areas and are away from wash areas. It should include:

- disposable booties – to cover boots if you are working in kauri dieback infected areas
- a hard brush
- if practical, a container of water for washing – discard used water into gravel or grass away from kauri areas
- disinfectant (e.g. 2 per cent Sterigene solution in a spray bottle)
- plastic bags or bins for containing any gear that may carry contaminated soil and cannot be cleaned on site
- a second pair of footwear for use in your vehicle, to prevent vehicles becoming a source of contamination.

Boot and gear wash areas

Includes permanent or temporary wash areas when activities need to be undertaken elsewhere on the farm in kauri areas. In the field, dispose of washing water and soil into grass or gravel, away from kauri. Wash areas should include:

- hard brushes – to remove all mud and soil from footwear and gear
- a wash bath – large bin or bucket
- disinfectant (e.g. spray bottle with 2 per cent Sterigene solution) – for spraying cleaned footwear. Allow to dry for one minute.



Wash down areas

Areas of hard standing (concrete pad, grate or gravel area, that is mud free), away from waterways and ideally with a sump or effluent disposal system. Temporary wash down areas should be on a hard well drained surface away from kauri areas. A commercial car wash is also acceptable if visited immediately on leaving a kauri area. Wash down areas should include:

- hard brushes for initial dry brushing and wet scrubbing for more persistent mud and soil
- a crowbar or similar to knock off large clods of mud if required
- a high-pressure hose and 2 per cent Sterigene solution in spray bottles or a pressurised spray unit.

Systematic inspection and cleaning of a vehicle or machinery from the top down should include, but not be limited to:

- cabin – floor, under seats
- body – underside, any crevices, ledges or gaps, footwells, tray, bumper bars, cab steps, around fuel tank
- wheels (inside and outside) – between dual wheels if fitted, spare wheel
- tray – chassis, hollow channels
- attached or associated equipment – buckets or blades including teeth.



LEGISLATION AND RULES

Below are central, regional and territorial authority rules that apply to activities near kauri or in areas where kauri dieback has been confirmed.

Rules that apply everywhere

Biosecurity Act 1993

Under the Biosecurity Act, *Phytophthora agathidicida* is an unwanted organism. This means it is an offence to release, cause to be released, spread, propagate, or act in a manner likely to encourage the propagation of this unwanted organism. For further information email info@mpi.govt.nz.

Biodiversity protection

Kauri (*Agathis australis*) are classified as a Nationally Vulnerable Threatened Species under the New Zealand Threat Classification System. This means biodiversity protection rules may apply to kauri on your property, and those kauri may also be further protected as listed, notable or scheduled tree(s) in district plans. Contact your regional council or city/district council for further information.





Regional and territorial authority requirements and rules

Item	Link to further information	In brief
<p>Northland Regional Pest Management Plan 2017-2027 (RPMP)</p>	<p>nrc.govt.nz/pestandpathwayplan</p>	<p>In the Northland region, kauri dieback disease is classified as a Sustained Control Disease. Landowners of properties identified as 'high risk' must implement an approved kauri dieback management plan to reduce the risk of kauri dieback disease spreading.</p> <p>There is also an obligation on anyone who sees or suspects the presence of kauri dieback to report the sighting to Northland Regional Council. (Rules 8.1.1, 8.1.2).</p>
<p>Auckland Council</p> <ul style="list-style-type: none"> Regional Pest Management Plan 2019-2029 (RPMP) 	<p>aucklandcouncil.govt.nz/RPMP</p>	<p>In the Auckland region, kauri dieback disease is classified as a Sustained Control Disease (section 7.7.5.2). Areas where kauri dieback disease are undetected are prioritised for protection through exclusion zones, which require increased hygiene measures. In addition, the rules require controls on movement of plant material and the movement of goods.</p>

<ul style="list-style-type: none"> Auckland Unitary Plan 	<p>aucklandcouncil.govt.nz/unitaryplan</p>	<p>In the Auckland Unitary Plan there are provisions (objectives, policies, standards, rules) that promote biosecurity actions and activities to reduce the spread of the organism causing kauri dieback, and impose restrictions on land disturbance and vegetation removal that relate to the movement of soil and kauri material. Refer to the Auckland Unitary Plan for further information.</p>
<ul style="list-style-type: none"> Controlled area notices 	<p>kauridieback.co.nz/controlled-areas</p>	<p>There are controlled area notices active in the Waitākere and Hunua ranges, Goldie Bush Scenic Reserve and on Hauraki Gulf islands. These notices restrict soil movement. Landowners neighbouring these areas, when entering the parklands, must adhere to the requirements of the controlled area notices.</p>
<p>Proposed Thames Coromandel District Council District Plan</p>	<p>tcdc.govt.nz/districtplan</p>	<p>Earthworks in the kauri hygiene zone (“an area three times the maximum radius of the canopy dripline of New Zealand kauri trees in the area the subject of proposed earthworks”) is only permitted to proceed with a Kauri Dieback Disease Risk Management Plan which has been approved by Thames Coromandel District Council.</p> <p>(Proposed District Plan Sections 43, 56, and 57)</p>

The above is a brief summary of the rules (at the time of writing) only. Additional information or clarification should be sought from the relevant organisation/agency.

CHECKLIST OF ON-FARM BIOSECURITY MEASURES TO PROTECT KAURI



	<p>Kauri areas</p>	<p>Do you know where kauri are on your farm?</p> <p>Check with your regional council or Department of Conservation office if you are unsure whether you have kauri on your property or where they are.</p>	<input type="radio"/>
	<p>Farm access</p>	<p>Do you have a single entry/exit point to your property?</p> <p>Having a single entry and exit point makes site management easier.</p>	<input type="radio"/>
	<p>Hygiene signage</p>	<p>Do you have clear kauri hygiene signage at your farm gate?</p> <p>To make everyone entering your property aware of the need to protect kauri.</p>	<input type="radio"/>
	<p>Biosecurity briefing area</p>	<p>Is there a biosecurity briefing area near the farm entrance where visitors stop to be briefed?</p> <p>Ideally located at the entrance of your property, this is where you can brief all those entering your property on health and safety/biosecurity issues.</p>	<input type="radio"/>

	<p>Visitor briefing</p>	<p>Do you brief visitors to your farm on kauri protection requirements and ensure they and their equipment arrive soil-free and disinfected?</p> <p>On visitors' arrival, communicate kauri dieback-associated risks and hygiene requirements as part of any health and safety/biosecurity briefing so they understand the part they can play in protecting kauri.</p>	<input type="radio"/>
	<p>Visitor risk</p>	<p>Do you ask visitors whether they have been in kauri areas?</p> <p>Determine the level of risk visitors and their activities on your farm may pose to kauri areas on your property, e.g. have they been in other kauri areas, are they wearing footwear from that visit, and are they intending to visit kauri areas on your property?</p>	<input type="radio"/>
	<p>Parking areas</p>	<p>Is there a designated public zone hard-stand parking area for visitors?</p> <p>Hard standing keeps visiting vehicles off the soil and reduces the risk of contaminated soil being brought onto your property.</p>	<input type="radio"/>
	<p>On-farm vehicle</p>	<p>Do you provide an on-farm vehicle that visitors can use if they need to visit other areas of your farm?</p> <p>Have a vehicle that remains on your property that visitors may use.</p>	<input type="radio"/>

	<p>Farm only boots and clothing</p>	<p>Do you have farm only boots and clothing?</p> <p>Have available footwear and clothing that remains on your farm, is regularly cleaned to soil-free, and can be used by you and anyone visiting the farm.</p>	<input type="radio"/>
	<p>Boot wash areas</p>	<p>Do you have a designated boot and gear wash area?</p> <p>Set up a wash area where you and any visitors can clean all footwear and gear to soil-free. This may include temporary areas set up during farm tours or events.</p>	<input type="radio"/>
	<p>Hygiene kits</p>	<p>Do you carry a hygiene kit in your farm vehicle(s) to clean boots and equipment to soil-free when entering and leaving kauri areas?</p> <p>Maintain and carry a hygiene kit (e.g. in farm vehicles or horse saddle bags, on quads) for use when you are away from your biosecurity wash-down areas.</p>	<input type="radio"/>
	<p>Wash down areas</p>	<p>Do you have a wash down area with a waste area/ sump to capture any run-off which you can use to clean vehicles, machinery and large equipment to soil free if they have been in kauri areas?</p> <p>Set up a larger wash area where you and any visitors can clean larger gear to soil-free. This may include temporary areas set up during farm tours or events.</p>	<input type="radio"/>
	<p>Machinery and equipment</p>	<p>Make sure all machinery and equipment coming onto your farm are soil-free on arrival and upon leaving.</p>	<input type="radio"/>

	New stock	Are new stock cleaned of soil upon arrival?	<input type="radio"/>
	Excluding stock	Are the kauri areas on your property fenced to exclude stock?	<input type="radio"/>
	Sourcing material	Do you source material (soil/substrate/gravel) from non-kauri areas? Choose a clean source from an area that doesn't have kauri.	<input type="radio"/>

On-farm kauri protection



OTHER KAURI GUIDES

Other useful documents from kauridieback.co.nz/how-to-guides:

- Hygiene procedures for kauri dieback
- Hunting guide
- Kauri care guide
- Land disturbance activities around kauri (including earthworks)
- Landfill disposal of contaminated material
- Propagation and planting of kauri
- Quarry hygiene: aggregate handling, transportation and storage
- Tree removal and pruning of kauri
- Vehicle and heavy machinery hygiene
- Trapping guide



CONTACT INFORMATION

Kauri dieback programme	kauridieback.co.nz
MPI	0800 008 333 kauridieback@mpi.govt.nz
DOC	0800 362 468 doc.govt.nz/nature/pests-and-threats/diseases/kauri-dieback/ kauridieback@doc.govt.nz
REGIONAL COUNCILS	
Northland Regional Council	0800 002 004 nrc.govt.nz/kauridieback kauridieback@nrc.govt.nz
Auckland Council	09 301 0101 aucklandcouncil.govt.nz/kauri kauri@aucklandcouncil.govt.nz
Waikato Regional Council	0800 800 401 waikatoregion.govt.nz/kauri
Bay of Plenty Regional Council	0800 884 881 ext 6010 info@boprc.govt.nz

If you think you have a kauri that looks unhealthy on your property, contact your regional council or the Department of Conservation.

LIFE STAGES OF KAURI



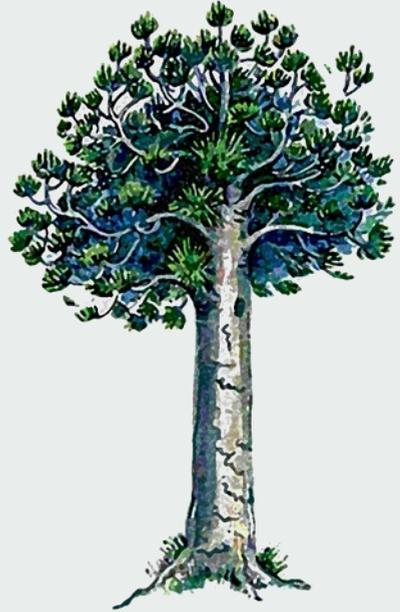
Sapling

Cone-shaped young tree.



Ricker

Pole-stage tree, branches shed from lower trunk, with a narrow to spreading conical crown (30-50+ years).



Mature kauri

Large emergent tree with an expansive spreading canopy, large permanent branches and bare trunk (100+ years).