TIAKINA KAURI
KAURI PROTECTION

Kauri Ora: Pruning and removing Kauri

Best practice guide for pruning and removing Kauri

BEST PRACTICE GUIDE

KA RAUHĪ TE TUPU O TE KAURI

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GIVE KAURI SPACE TO GROW

TIAKINA KAURI
KAURI PROTECTION

Tiakina Kauri is an agency based within Biosecurity New Zealand that provides national direction for the achievement of the objectives of the National Plan for Kauri, through active partnership with mana whenua and collaboration with regional councils and the Department of Conservation.

For more information about protecting Kauri, visit **www.kauriprotection.co.nz**

ISBN: 978-1-997309-68-0 (print) ISBN: 978-1-997309-69-7 (online)

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About this guide

This guide provides risk management guidelines to help mitigate the spread of the pathogen *Phytophthora agathidicida* (PA) when pruning and removing Kauri or when carrying out arborist work near Kauri. The guide is intended to cover all aspects of arborist work.

These guidelines are not policy but should be considered by planners, land managers, arboriculture industry, contractors and members of the public when undertaking pruning and removal of Kauri and are based on managing the risks associated with PA.

This guide is not intended for commercial forestry operations involving the removal of live Kauri.

For more information about protecting Kauri and the PA pathogen, visit **www.kauriprotection.co.nz**

The National Pest Management Plan for Kauri

In August 2022, a National Plan was launched to help protect Kauri from the *Phytophthora agathidicida* (PA) pathogen. The National Plan includes 10 rules that apply to anyone who grows Kauri, goes into Kauri forests, or lives or works around Kauri.

By following this guide and the rules of the National Plan, we can all help protect Kauri for generations to come.

How do the National Plan rules for Kauri work?

The Tiakina Kauri | Kauri Protection programme helps people understand and comply with the National Plan rules through education and awareness programmes.

In cases of clear and substantial or continued non-compliance with the rules, prosecution or infringement fees could be applied.

For more information about the National Plan, visit **www.kauriprotection.co.nz/national-plan**

National Plan rules relating to pruning and removing Kauri

Obligation to report

Land occupiers are obligated to report symptomatic or sick Kauri to Tiakina Kauri or an authorised person **(Rule 1).** You can also report them to your unitary or regional council.

PA Risk Management Plans

If the area is already infected with PA or has a high risk of being infected, Tiakina Kauri may ask you to develop a PA Risk Management Plan to help reduce the risk of PA spreading on your property. **(Rule 4).**

Earthworks PA Risk Management Plans

If you want to undertake any earthworks within a Kauri Hygiene Zone, you must have an Earthworks Risk Management Plan. **(Rule 5)**

A "how to" guide and a template for creating this plan are available at **www.kauriprotection.co.nz/resources** for both plans.

Biosecurity Act 1993

Under the Biosecurity Act, PA is an unwanted organism. This means it is an offence to release PA, cause PA to be released, spread, propagate, or act in a manner likely to encourage the propagation of PA. For more information about unwanted organisms, visit: **www.mpi.govt.nz/biosecurity** or email **info@mpi.govt.nz**

About the PA pathogen

The PA pathogen infects Kauri through their roots and restricts the trees' ability to transport water and nutrients between the roots and the leaves. This causes the fatal condition known as kauri dieback disease, which eventually starves the Kauri.

There is no proven way to cure an infected Kauri, and there are limited treatment options. Managing activities is key to preventing the movement of PA.

To stop the PA pathogen from spreading, we must follow correct hygiene protocols when moving and working around Kauri.

The PA pathogen can be spread by:

- vehicles and machinery;
- footwear, clothing or equipment that touches the soil;
- animals, including wild pigs and stock.

PA pathogen infection can cause bleeding gum

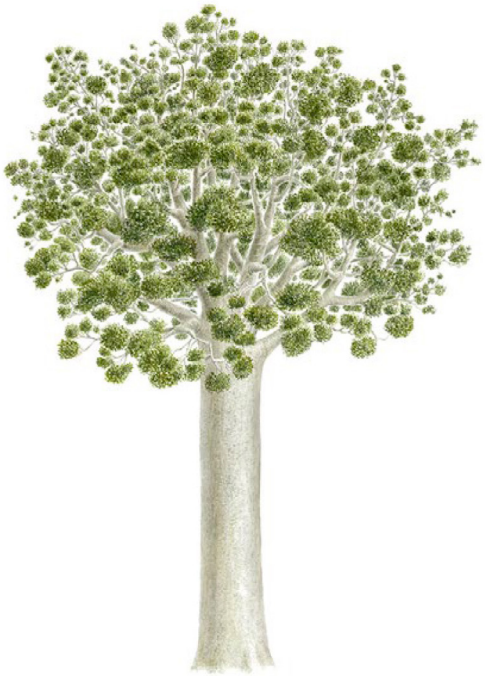
View of Kauri canopy with dead branches

Recognition of Kauri

Identifying Kauri from other trees is the key first step to protecting Kauri. Kauri has identifiable features including three main stages of their life that are important to know if they are to be accurately identified in the field.

Ricker
(<30 years)

Emergent
(30-80+ years)



Mature
(80-100+ years)

Kauri Hygiene Zone (KHZ)

The best way to protect Kauri and avoid introducing or spreading the PA pathogen through the movement of soil or dirt, is to avoid operations around Kauri Hygiene Zones and Kauri forests whenever possible.

To protect Kauri, it is important not to damage or disturb their roots. Kauri roots are shallow and fragile and extend outwards about 3x the radius of the canopy of the tree; this area is called the Kauri Hygiene Zone.

Figure 1: The Kauri Hygiene Zone for a single Kauri

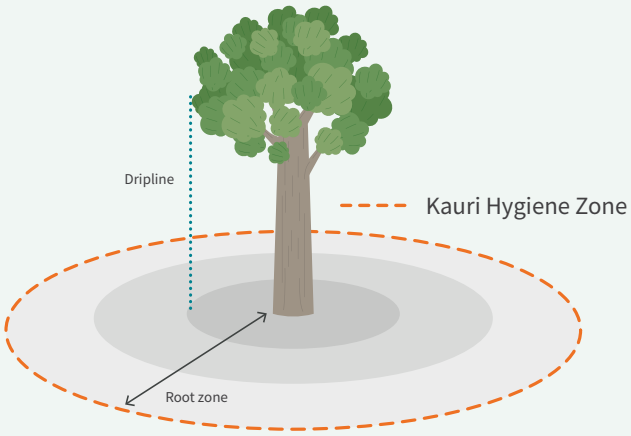
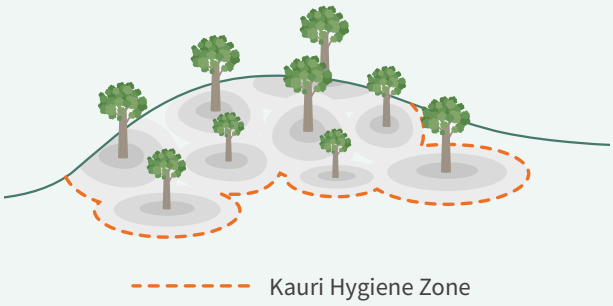


Figure 2: The Kauri Hygiene Zones for multiple Kauri



Background

These guidelines are based on managing the risks of introducing and spreading PA through tree removal, stump grinding and pruning activities. The risk of spreading PA through arborist works varies from low to high depending on the type of work as well as the equipment or machinery being used. Pruning with hand tools and leaving branches in situ is considered low risk whereas felling or removing large trees with machinery or grinding stumps is considered high risk. Movement of root, trunk or bark materials (including by-products produced during pruning or removal e.g. sawdust) could spread PA to other sites.

A precautionary approach is taken to manage the level of uncertainty around whether all Kauri wood is infected or not. There is conclusive evidence to prove that PA has been found in certain parts of the tree, however there is inconclusive evidence to understand the full extent of where PA might be within Kauri wood. Due to this uncertainty, a number of assumptions have been made which has informed these guidelines.

Assumptions and constraints

- The entire Kauri Hygiene Zone is potentially infected with PA.
- PA distribution is proximate and associated within infected root, cambium and bark tissues, and is therefore unlikely to occur above symptomatic collar rot trunk lesions.
- The spatial distribution of PA within infected trees is unlikely to be fully systemic as PA is not known to occur deep into Kauri heartwood or to occur in the tree canopy.
- The spores and other life stages of PA remain viable and infectious within Kauri tissue for an unknown period of time.
- Long-lived spores (oospores) of PA can survive and remain viable in the soil, long after a tree dies (at least six years and potentially a lot longer) (Horner & Hough, 2015).
- Soil, litter debris and root materials within the entire root zone of infected Kauri can contain viable propagules of PA.
- Kauri infected with PA can die without showing obvious collar and trunk lesions.
- Ricker (juvenile conical shaped) Kauri can die without obvious lesions or with basal lesions and fall after only a year. Therefore, all fallen Kauri must be treated as potentially infected or contaminated.
- Wood rot, in areas where one would expect a lesion to occur, may be an indicator of a lesion prior to the tree losing its bark.

Planning considerations

Mana whenua consider Kauri a taonga (treasure). Kauri conservation status is threatened, meaning the species is facing a high risk of extinction. Consider the ecological and cultural value of Kauri before removing any Kauri from private property and also check the notable tree list with your local council. Check with your local council before disposing of Kauri wood to a landfill as it may be considered inappropriate to local iwi. Please also contact your local council or land management agency if there are local policy or regulatory constraints.

The following are key considerations when planning arborist activities:

- Plan activities to avoid Kauri Hygiene Zones as much as possible. Consider preparing a PA Risk Management Plan to identify and mitigate all vectors. The template for this can be found on the Tiakina Kauri website **(Rule 4).**
- Arrive clean, leave clean. If you are going off track or onto a track where you will touch the forest floor, you must clean all visible soil and organic matter off items that may touch the ground, both before you enter and when you leave the forest. Items considered a risk include tools, cars, bikes, sticks, shoes, gloves etc. **(Rule 8).**
- Treat all Kauri as if they are infected. PA may be present even if there are no visible disease symptoms.
- If you recognise PA disease symptoms in Kauri, contain access to the site at the Kauri Hygiene Zone. Do not remove any soil or vegetative material. If your Kauri trees look unhealthy, you must let Tiakina Kauri, or your regional council know **(Rule 1).** Rule 1 applies to land occupiers.
- Avoid operations during winter and when the ground is wet as much as possible as PA spreads more easily in these conditions.
- There are regulations in relation to milling Kauri for timber. Check with MPI for these regulations.

PA management

Develop and follow a PA Risk Management Plans for arborist activities. This will need to be site specific but can easily be replicated for other sites. These need to identify all the ways dirt can be moved through your arborist activities, and how to manage each one.

Hygiene best practice for arborist activities is as follows:

- Clean all footwear, equipment vehicles and machinery so they are dirt free and then disinfect. Items not cleaned on site after works must be contained properly and taken back to base or depot for cleaning (**Rule 8**).
- Avoid Kauri Hygiene Zones where possible.
- Set the boundaries of the Kauri Hygiene Zone and set up entry and exit points for hygiene for every tree or stand. This also helps identify zones that need to be avoided.
- Carry out hygiene practice when moving in and out of each Kauri Hygiene Zone that you are working in.
- If a temporary hygiene station is required, set it up on the boundary of the Kauri Hygiene Zone. Ensure there is enough hygiene equipment and disinfectant provided and that runoff is contained and disposed of correctly. Avoid recontamination during this process.
- In cases where a temporary station isn't required, carry and use a hygiene kit consisting of a scrubbing brush and spray bottle with disinfectant.
- Read the **Kauri Hygiene Principles Guide** on the Tiakina Kauri website for more information on temporary hygiene stations and kits.
- Keep the number of people accessing Kauri Hygiene Zones to a minimum to reduce risk.
- Consider using tarpaulins as drop sheets to physically separate soil, root and leaf litter material from branches being dropped.
- Felling and pruning of Kauri should only occur during dry periods. The only exception should be where trees pose an immediate health and safety hazard, or at sites where the movement of soil through footwear and equipment can be avoided.
- Arborists carrying out activities in a Kauri Hygiene Zone that involve machinery, like dragging logs, must first develop and then operate in accordance with an **Earthworks Risk Management Plan**. This is **Rule 5** of the NPMP.
- Excess material such as saw dust and bark must be left in situ where possible.
- Where possible, avoid dropping material into Kauri Hygiene Zones which are not being worked in. Consider placing drop sheets in other zones where branches may fall if branches are to be removed.

If the tree is known or suspected of being infected:

- **Do not** dispose of or recycle material into green waste or compost etc. There is a high risk of spreading PA if materials are composted incorrectly. See **Heat Treatment guide** on the Tiakina Kauri website for more information about killing PA.
- **Do not** use for firewood or other uses (e.g. woodwork or building).

Figure 3: Example of a temporary station for projects on tracks or boundary of KHZs

Pruning and felling operations

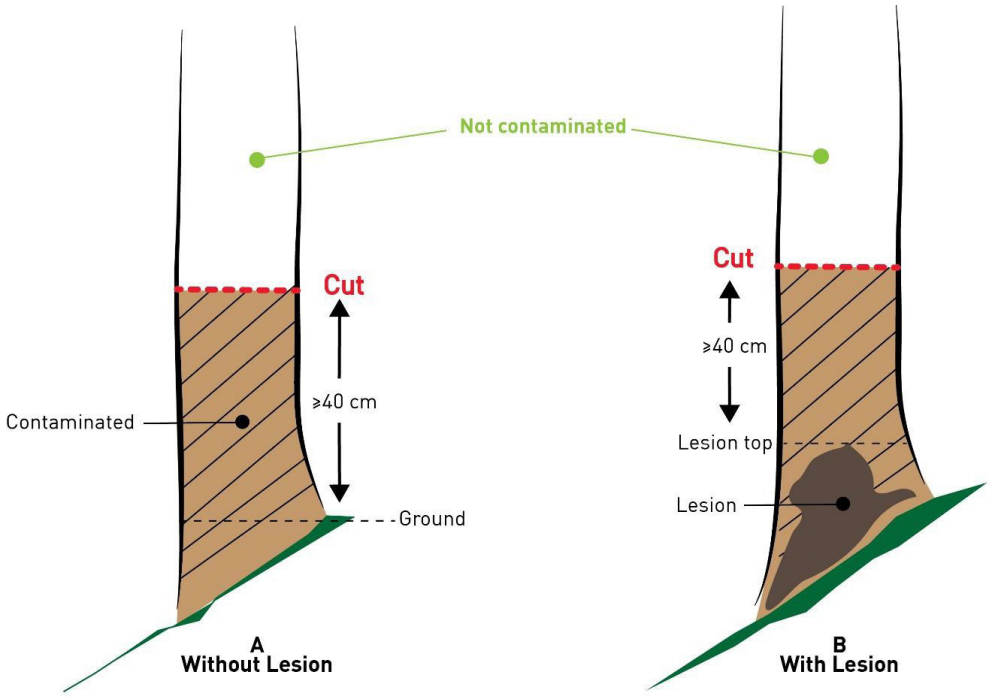
Removal of Kauri branches, logs and other material is not recommended. Leave material in situ as much as possible, especially if infected.

Reducing the risk of PA spread can be achieved by following the recommended best practice for pruning and felling Kauri.

Live Kauri lacking lesions should be cut at least 40 cm (or higher) above the highest point of the ground (Figure 2A). The material above this cut can be considered"not contaminated" and can be removed.

Live Kauri that have lesions should be cut at least 40 cm (or higher) above the upper point of the highest lesion on the trunk. The material above the cut can be considered as ‘not contaminated’ (Figure 4B).

Figure 4: Live Kauri (A) lacking bark lesions cut at least 40cm above the highest point of the ground and (B) with bark lesions cut at least 40cm above the highest lesion.



Standing dead Kauri that are:

1. lacking bark;
2. with a clean rot-free outer trunk from the base of the tree; and
3. less than 50 cm at breast height diameter (DBH).

must be cut at least 60 cm (or greater) above the highest point from the ground (Figure 3A),

Those with greater girth (>50 cm DBH) must be cut at least 100 cm (or greater) above the highest point from the ground (Figure 3B).

The stump below the cut needs to be treated as "contaminated". The material above the cut can be considered as "not contaminated".

Standing dead Kauri:

- lacking bark, and
- with evidence of wood rot that has extended from the ground up the outer trunk should be cut:
- at least 100 cm (or greater) above the top of the rot-zone if the DBH of the trunk is less than 50 cm (Figure 4A)
- 100 cm (or greater) above the top of the rot-zone if the DBH of the trunk is greater than 50 cm (Figure 4B)

Figure 5: Standing dead Kauri lacking bark and wood rot: (A) <50cm DBH cut at least 60cm from the ground; (B) >50cm DBH cut at least 100cm above the ground

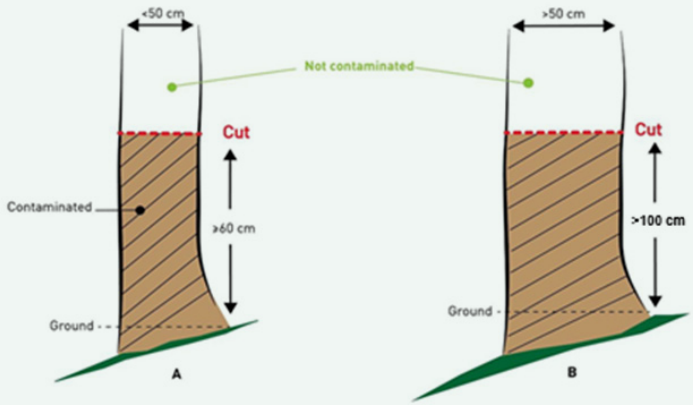
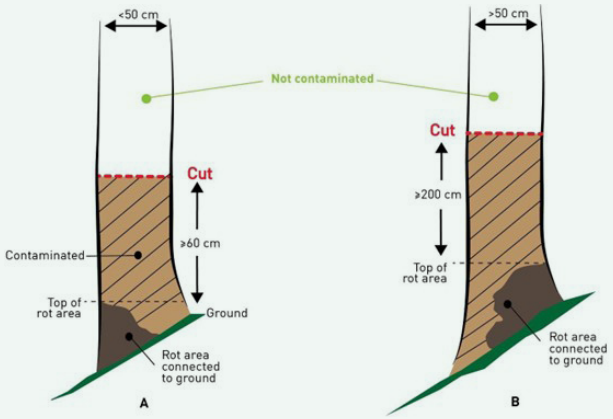


Figure 6: Standing dead Kauri lacking bark with wood rot from the ground (A) <50cm DBH cut at least 60cm above the top of the rot (B) >50cm cut at least 100cms above the top of the rot.



Extraction operations

There are different methods for extracting cut logs. For helicopter, crane and Hiab removals, the risk of introducing or spreading PA is low if logs do not come in contact with the ground after being cut. Dragging logs is a high-risk removal method, as it can move contaminated dirt from where the tree is cut to the location the log is picked up. If dragging through any Kauri Hygiene Zones, an Earth Risk Management Plan will be required under Rule 5.

When removing any parts of the tree for later use, remove soil using a brush and spray the brush using a methylated spirits mix or sterigene afterwards. A drop sheet is recommended to avoid contact with the Kauri Hygiene Zone and to make it easier to remove soil. Once you are beyond this, the logs can be dragged to a pick-up location.

Transporting infected materials

All material deemed contaminated should be left in the ground or in situ where possible. If this cannot be done, then remove it to an approved landfill for deep burial.

If contaminated material must be removed, then this must be cleaned to be dirt free and disinfected. This includes all footwear, equipment, vehicles and machinery used in the operation. Avoid vehicles and machinery accessing Kauri Hygiene Zones where infected material sits.

Any wood waste generated off site from processing any uncontaminated wood should be disposed of appropriately and not in a Kauri forest.

Links

Transportation should consider the vehicle and heavy equipment hygiene guidelines.

To find a certified, approved arborist please visit **www.nzarb.org.nz**

For further information on Kauri protection visit **www.kauriprotection.co.nz**

Further reading

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For more information about protecting Kauri, visit **www.kauriprotection.co.nz**

November 2025