



Kauri Dieback Hygiene

Best Practice Guidelines



Contents

- Background.....3
- Purpose 3
- Kauri forest in Northland 3
- Consideration of kauri..... **Error! Bookmark not defined.**
- Understanding the importance of hygiene..... 4
- Planning activities in the forest and around kauri..... 5
- Kauri Protections Area (KPA) 5
- Key messages of hygiene 6
- Kauri Protection Area (KPA) hygiene requirements 7
- Hygiene points..... 9
- Vehicle and machine hygiene 9
- Activity hygiene plan..... 10
- Kauri dieback information sheets 10
- Summary **Error! Bookmark not defined.**11

Background

Kauri (*Agathis australis*) are a cornerstone of the indigenous forests of the upper North Island and have had a large part to play not just in the landscape of Aotearoa but also in its culture and early history. Kauri are considered a taonga by many New Zealanders, particularly Māori, who see the health of kauri as a sign of general wellbeing, therefore their value cannot be understated.

Phytophthora agathidicida (Pa) is the pathogen that causes dieback disease in kauri (commonly referred to as “kauri dieback”). It was only discovered in 2009 and scientists believe it is probably exotic to NZ and introduced within the last few hundred years. Pa is a soil-borne pathogen so minimising the movement of soil or plant material potentially contaminated with Pa by people, animals, and limited natural spread (over small distances) is fundamental to the management of kauri dieback. Distribution of Pa is sporadic with many forests known to be infected but many others likely to be pathogen-free.

Purpose

To provide kauri dieback hygiene advice to individuals and groups planning or conducting any activity in or around kauri or in native forests in Northland. To ensure that all Northlanders have the knowledge, understanding and know how on being hygienic for their activity, recreational or work, in and around kauri.

Kauri forest in Northland

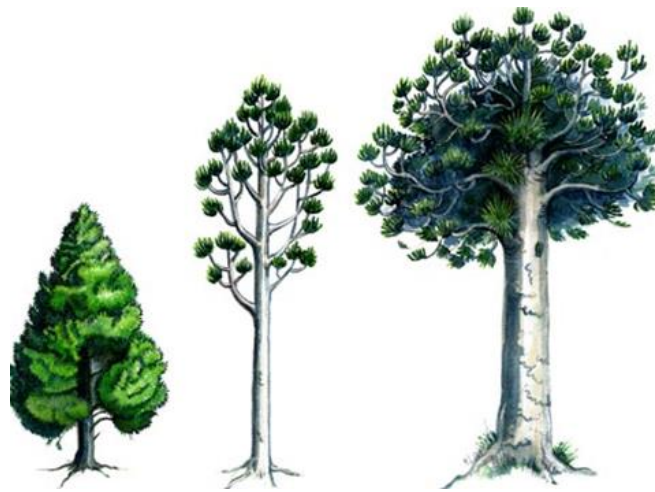
Kauri forest distribution extends from the 38°S latitude line north, from the top of the Waikato Region through Auckland and Northland Regions. They once covered a million hectares of the north but today only about 7500 hectares of mature forest remain (see figure 2 below). Some kauri forests are easily identified on public lands like Waipoua Forest, the largest remaining kauri forest in the world. Other kauri forests and stands are less easily identifiable and have the potential to be in remnant forests on private lands across the region.

Ground assessments and soil sampling is an ongoing exercise currently being carried out to determine the extent of kauri dieback disease presence throughout Northland.

Figure 1: Known kauri forest distribution in Northland (2006). Many other smaller groves of kauri forest and individual trees exist across the region.



Figure 2. Life stages of the kauri. The young tree (left), a ricker (middle) and mature tree (right).



Consideration of Kauri

It is important to understand that the pathogen which causes kauri dieback disease lives in the soil and is easily spread. Equally important is having an awareness of kauri and where they exist on your property, in your neighbourhood, work site or place of recreational activity. With a basic knowledge of the disease and an understanding of where kauri exist or may exist, greatly assists in completing the important step of planning when determining whether work or other activities are likely to impact the health of Kauri and the forest ecosystem in general.

When planning forest related activities, it is vitally important to consider the following;

- Are there kauri or kauri stands in the forest or near the activity?
- Does the activity need to be carried out in and around kauri forests?
- If the activity is essential, then hygiene **must** be applied.
- If hygiene cannot be guaranteed the activity and or location must be reconsidered.

Ask yourself this question: Do I need to enter the kauri forest or be around Kauri trees? Preventing movement of people, animals and vehicles around kauri is the best way to stop disease spread. The best advice is if the activity or job is not essential then don't do it, stay away from Kauri wherever possible.

Understanding the importance of hygiene

If the activity or job is considered essential, then strict hygiene must be applied. Implementation of hygiene in kauri forests, stands or around individual kauri trees is paramount in preventing the introduction and spread of the pathogen and disease. Infected soil may easily be transported by dirty footwear, equipment, 4WD's and other off-road vehicles. It essential that a high level of cleanliness or hygiene is always maintained. This is before you leave home, during the activity in the forest, before you leave the forest and when you arrive home. It's important to remember to: *arrive clean, leave clean*.

Planning activities in the forest and around Kauri

Depending on the activity or job kauri that may be encountered could exist in a forest, in remnant patches of native vegetation, as a small stand in a paddock or a parkland or individually anywhere. The recommendations in this document aimed at protecting kauri as often as possible although understanding that not every tree can be saved.

The first step of planning is to obtain background information on the locations of kauri stands, trees and infected sites. This should include aerial photography and maps. NRC has the location data of some kauri trees in GIS and where possible will provide kauri data on a map or equivalent information.

Note: This data is limited and may only be of canopy visible kauri. We expect that you will encounter kauri that are not identified on a map. Keep an eye out for saplings!

During the planning process it is important to consider the following to determine how best to avoid and if you can't avoid, protect kauri.

- **Plan routes that avoid kauri.** If you encounter trees or groves always avoid them. Stay out of the Kauri Protection Area. This is an area 3x the drip line of a Kauri tree and will be a bigger area in large stands of kauri (see below)
- **Don't carry our activities in winter.** Avoid wet soil or mud as this makes spreading soil easy. This includes creeks.
- **Traverse along the lower slope where possible.** Always stay below any kauri and stands you encounter. Try and avoid spurs and ridges as kauri are often present.
- **Determine locations of hygiene points.** Hygiene points are where you clean down and remove soil. This point must be away from the Kauri Protection Area (KPA) and never upslope of kauri.
- **Carry a hygiene kit.** This contains all the soil removal equipment you will need. Keep it with you or in your car.
- **Clean all your gear.** Ensure everything worn or taken into and around kauri for the activity or job is clean before you start. all boots, equipment and vehicles (if required) are clean prior to the start of each day.

Kauri Protection Area (KPA)

The kauri protection area (KPA) is an area around the tree that encompasses the trunk and the root system. This area is what needs to be protected. No soils movement is to occur at all in this area. The total size of the KPA is determined by the number of kauri present in the stand and where they exist on the slope. The perimeter of the KPA is the 3 x the drip line of the most outlying tree in the stand. If the stand exist on the mid slope the KPA extends to the ridge line to protect the area above the trees from the introduction of the pathogen.

Figure 3. Image of a kauri drip line and root zone

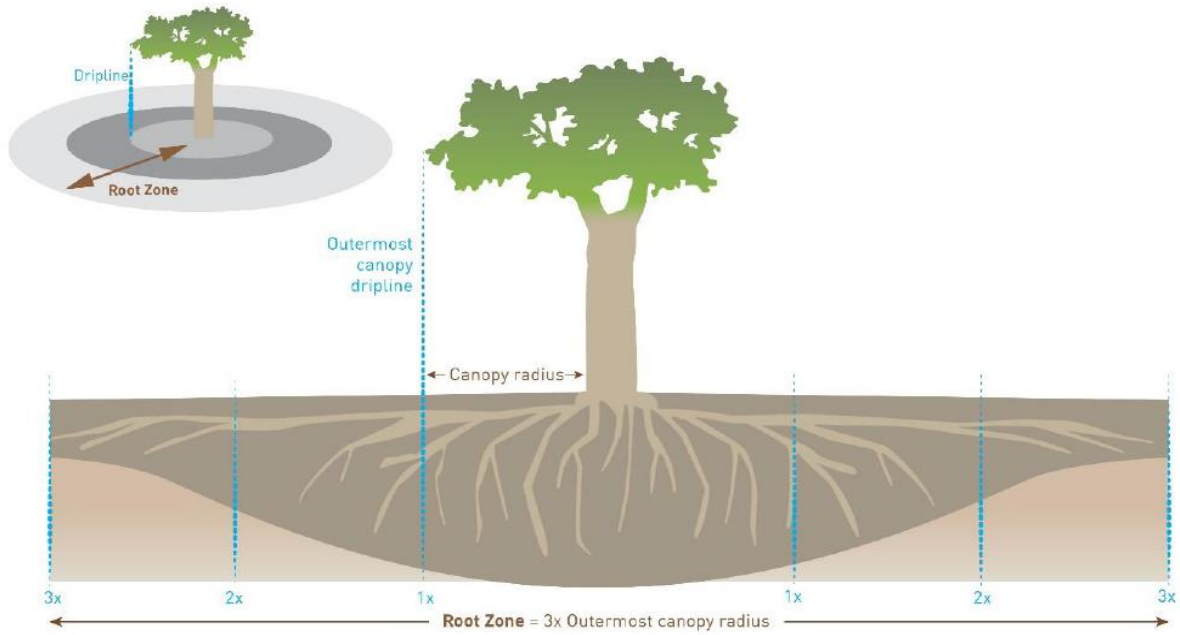
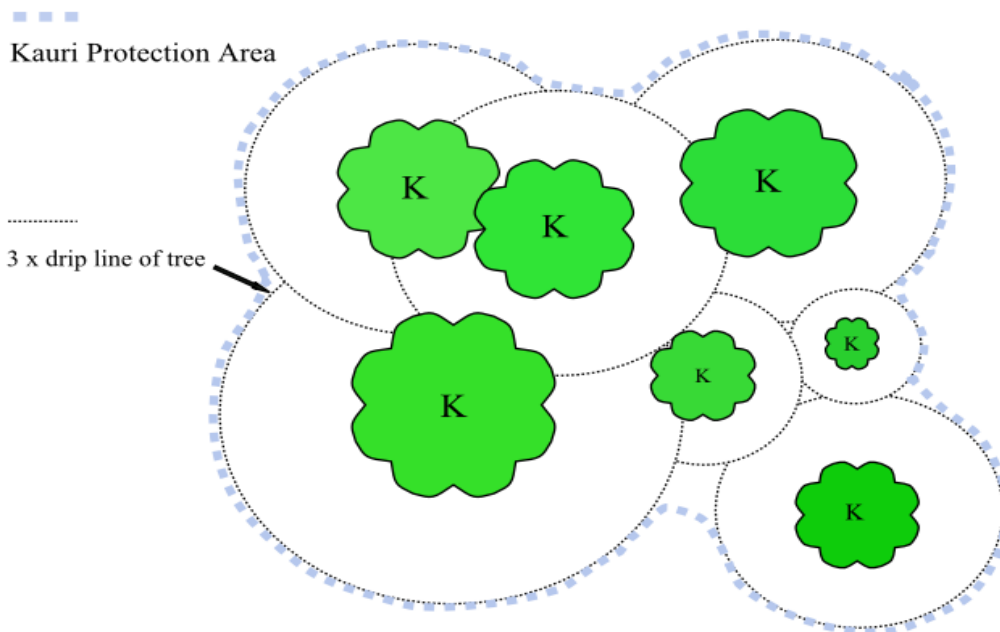


Figure 4. Aerial view image of a KPA example



Key messages of hygiene

The following are the key points of implementing strict hygiene around KPA's and the forest in general:

- ALWAYS arrive clean and leave clean.
- ALWAYS **remove all soil from footwear and equipment!**
- Avoid all non-essential activities in and around kauri trees and stands.
- ALWAYS carry a hygiene kit when in the forest and around Kauri (see Summary below).
- ALWAYS keep a clean spare pair of footwear in the car to put on afterwards.
- ALWAYS carry out essential activities in the warmer months of the year when the soil is drier. This drastically reduces the risk of spreading soil and is highly recommended.
- **DO NOT** conduct activities in kauri forests during the wetter months of the year.
- **DO NOT** enter KPA (or upslope of) unless 100% removed of soil (see Figure 5 below).
- **DO NOT** work in known infected sites or infested areas at any time of the year.
- **DO NOT** leave the home or office with dirty boots or equipment.

Kauri Protection Area (KPA) hygiene requirements

Understanding there are a variety of activities and jobs that require being in the forest and around kauri and that some of those require entering KPA's the following applies:

- **Remove all dirt** when entering KPA's from footwear and equipment. No vehicles or machinery are permitted in the KPA in a forest or remnant bush environments.
- **Undertake activities around kauri** prior to operating within non-kauri areas.
- **Set up a hygiene point** outside the edge of a KPA and down slope of other kauri. (see Figure 6 below). *Note: Surface and sub-surface water will flow down slope taking potentially infected soil into the root system of trees downslope out of the vicinity of the activity or job.*
- **Wearing reusable** non disposable overshoe booties is an option for each KPA. Sourcing an overshoe bootie that is durable and can be washed and reused regularly is recommended. These need to be cleaned at the hygiene point like footwear. Disposable ones are not recommended.

Figure 5. Images of dirty boots on the left and clean boots on the right. The right pair is free of all dirt.



Figure 6. Aerial view example of a KPA with hygiene point and where to traverse past kauri

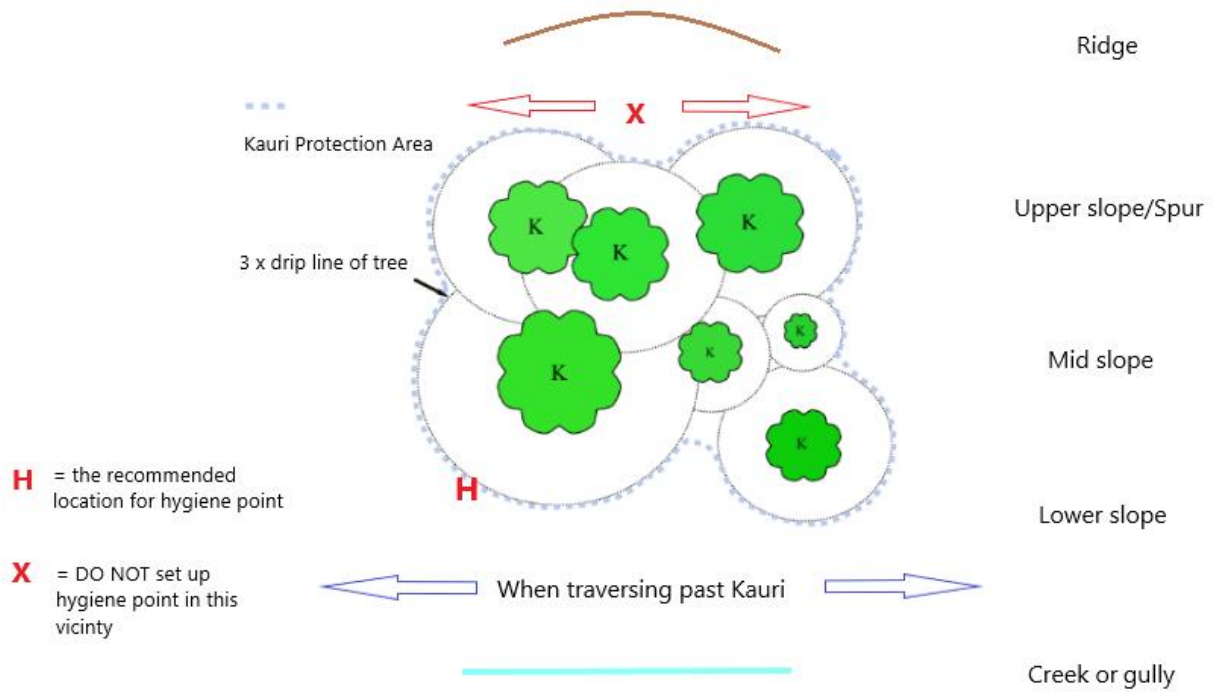
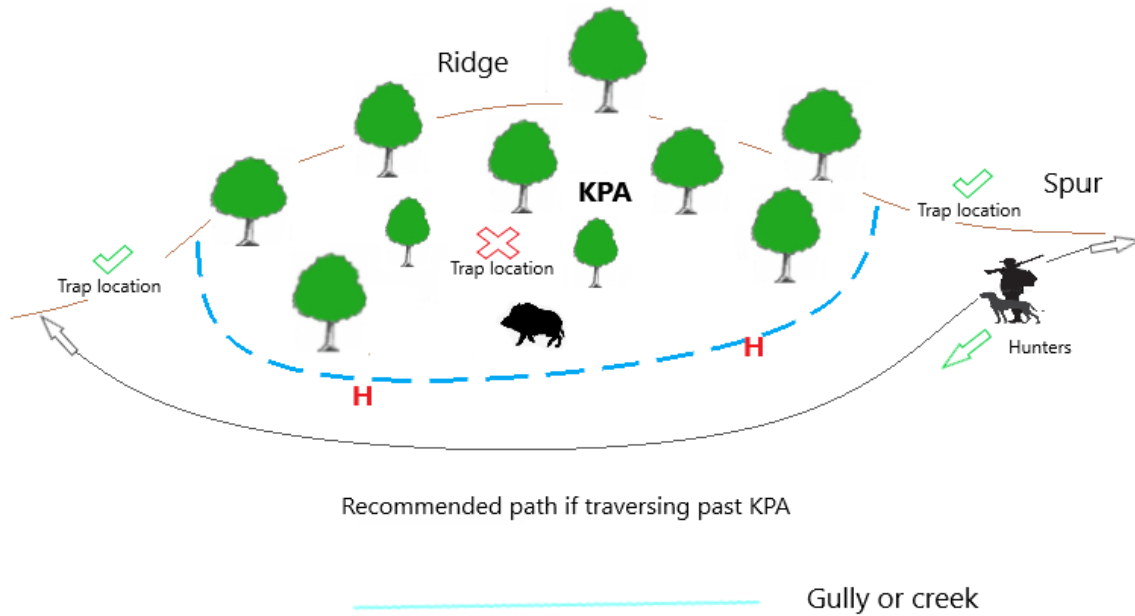


Figure 7. Side view example of a KPA with hygiene point and where to traverse past kauri



H = the recommended location for hygiene point. Do not set up a hygiene point on a ridge or spur.

Hygiene point

A hygiene point is a location at the edge of the forest or KPA where by an individual carries out appropriate hygiene. Although at this point you will have arrived clean to the forest, site or activity it is essential when working in the KPA to have the highest level of hygiene. **This means remove all dirt!** Hygiene must be carried out when entering and exiting KPA's.

Hygiene points for activities in the forest and around Kauri are at any of the following locations:

- Entering the forest area for the first time (from a paddock or road),
- Entering and exiting KPA's,
- Crossing catchment zones, ridges or spurs.
- Exiting the forest.

Hygiene is achieved by scrubbing, checking and spraying disinfectant in order to PHYSICALLY remove all the dirt. See checklist for minimum requirement equipment for hygiene kit and other suggested items.

Vehicle and machine hygiene

Regarding soil movement vehicles and machinery of all types pose the highest risk by the sheer volume they can potentially move. Maintaining strict hygiene for vehicles is therefore difficult if not impossible.

The following recommendations are made regarding vehicle and machinery hygiene:

- **All vehicles must not be used** in and around KPA's and only permitted along forest tracks if Kauri are known to be absent.
- **All vehicles must not be used** in and around the forest in **winter**
- Quads and ATV's used for work are permitted in forest areas but only if all dirt is removed.
- **No** recreational activities involving **motorbikes, quads and ATV's** are permitted in and around KPA's and the forest areas in general, away from well-formed gravel roads.

For work or activities involving vehicle or machine hygiene see document entitled Kauri Dieback Programme Best Practice Guidelines for Vehicles and Machinery by accessing the link below.

<https://www.kauridieback.co.nz/media/1464/best-practice-guidelines-vehicles-and-heavy-machinery-hygiene.pdf>

NRC is developing Risk Planner documents to help individuals and business's plan work around kauri and native forest involving vehicles and machinery. It is essential that the Risk Planners are used when planning work regardless of their size of vehicle or machinery. These will be available soon. In the mean time please contact the Kauri Dieback Team at NRC at kauridieback@nrc.govt.nz for further information.

Activity hygiene plan

To assist those undertaking activities in forest areas and potentially in or around KPA's a brief activity plan must be prepared prior to the activity. The plan is designed to ensure that if the activity is essential that soil movement does not occur during that activity and that KPA's are known or prepared for. Individuals or groups that could benefit from an activity hygiene plan include trappers, hunters, off track walkers, researchers and horse riders to name a few. Use the activity hygiene plan (available on NRC website) when planning your activity. Seek hygiene advice and or training from NRC Biosecurity staff where possible.

Link for activity plan available soon. Please contact staff for more information.

Kauri Dieback information sheets

Northland Regional Council is developing a suite of information sheets aimed at specific activities that occur in the forest or for certain audiences. The sheets can be used to help fill out your plan. These can be viewed on the NRC website.

- **Hunters:** [Kauri dieback hygiene information for hunters \(PDF, 381KB\)](#)
- **Trappers:** [Kauri dieback hygiene information for trappers \(PDF, 504KB\)](#)
- **Landowners:** [Kauri dieback hygiene information for landowners \(PDF, 462KB\)](#)
- **Visitors:** [Kauri dieback hygiene information for visitors \(PDF, 373KB\)](#)

The difficulty around a high level of hygiene for some activities is understood. What is expected is that individuals, groups or business's will gain a basic understanding of Kauri dieback disease and hygiene, make changes in their activity or work via an activity or management plan to help prevent pathogen and disease spread.

Summary

The following are key points to remember when carrying out activities or work in native forests or KPA's:

Planning

- Plan your activities around avoiding Kauri.
- Fill out and carry an activity hygiene plan
- Do not carry our activities in and around kauri in winter and when the soil is wet.
- Obtain advice and or training

Hygiene

- Always carry a hygiene kit.
- Take a change of footwear to your activity to put on clean afterwards.
- Place dirty footwear in boot bag after activity.
- Avoid KPA's during the activity not identified in the planning process.
- Remove all dirt from surfaces.
- Maintain a high level of hygiene when entering and exiting KPA's
- Take enough supplies of methylated spirits and water for the whole activity.
- During summer do not introduce water into a dry environment when cleaning down.
- Do not allow material from a hygiene point to flow or drain into the KPA
- Ensure boots are dry from cleaning before continuing past the hygiene point

Messages

- Scrub, Check and Spray.
- Arrive Clean, Leave Clean.

Hygiene kit minimum contents:

- Stiff bristle scrubbing brush
- 500ml spray bottle with disinfectant
- boot bag
- 1 litre pump sprayer with water



Disinfectant: 70% methylated spirits and 30% water mix, 25% bleach in water or Sterigene at 2% mix.



SCRUB
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