



PROTECTING KAURI: PRINCIPLES OF HYGIENE

Preventing the spread of kauri dieback disease
with best practice hygiene guidelines

Prepared by:

Kim Parker (Waikato Regional Council)

Yue Chin Chew (Auckland Council)

Endorsed by:

Auckland Council, Waikato Regional Council, Northland Regional Council, Bay of Plenty Regional Council and Department of Conservation.

Consultation and peer review

Thanks to the following for their expert advice and support in the development of these principles.

Agency	Participants
Kauri Dieback National Programme - planning and intelligence workstream	Chris Green (DOC), Travis Ashcroft (MPI), Tony Beauchamp (DOC), Gavin Clapperton (NRC), Murray Fea (AC)
Auckland Council Kauri Dieback Team	Lisa Tolich, Zacc Forbes-Smith, Murray Fea, Alistair Smith
Department of Conservation	Lindi Eloff, Tony Beauchamp
Northland Regional Council	Gavin Clapperton, Adrian Peachey



PRINCIPLES OF HYGIENE

The following six principles are fundamental truths when it comes to the best actions to protect kauri from kauri dieback disease. They have been developed for people who are operating off track and serve as the foundation for behaviours to aid in protecting kauri. They are based on best current scientific information available.

Kauri dieback disease is caused by a microscopic soil-borne organism called *Phytophthora agathidicida* (*P. agathidicida*). This organism enters the tree through its root system and affects the tree's ability to transfer nutrients and water, in effect starving the tree.

For further information on kauri dieback and for best practice guidelines around specific activities, visit kauriprotection.co.nz.

This is an interim document while the National Kauri Protection Programme establishes the National Kauri Dieback Pest Management Plan and management agency. Once established, the National Kauri Protection Programme will create materials for the implementation of the plan which will include principles of hygiene for kauri protection and other supporting materials for activity type.



I. AVOID KAURI FORESTS

Choose to undertake your activity or event away from forests with kauri in them, where possible. This is the best action you can take to protect kauri as it wholly stops human-mediated movement of dirt into kauri areas.

2. AVOID KNOWN INFECTED SITES

- a) No activities should take place in areas contaminated with *P. agathidicida*.
- b) Avoid activities downslope of known infected areas.
- c) If activities are required within a contaminated area, get advice from the appropriate land management agency or regional council kauri dieback team prior to undertaking them.

Hygiene considerations will include, but are not limited to, not moving footwear, clothing and equipment from contaminated areas to other sites.

For further information on kauri locations or kauri dieback sites on public land, contact your local Department of Conservation (DOC) office. Regarding kauri in regional parks or private land, contact Auckland Council, Northland, Waikato or Bay of Plenty regional councils or the Ministry for Primary Industries. Visit kauriprotection.co.nz/kauri-maps to view a kauri dieback locations map (note not all sites are marked on this map due to Privacy Act requirements).



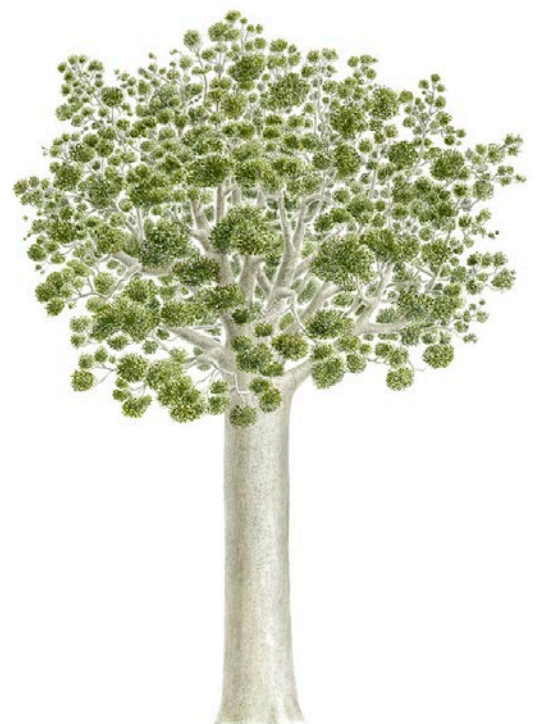
LIFE STAGES OF KAURI



RICKER



EMERGENT



MATURE

3. IF IN KAURI FORESTS, AVOID KAURI

It is best to avoid contact with kauri as far as possible. Therefore, planning your activities prior to undertaking them is critical.

In situations where it is not possible to avoid kauri, and hygiene measures can be undertaken, the following procedures must be performed.

- a) Undertake your activities away from kauri. Plan routes to avoid kauri.

- b) Structure work procedures to take place in low-risk locations first, for example, work on-track before working off-track.
- c) Stay outside the kauri root zone (see figure 1). This includes all vehicle, machinery and equipment.
- d) When selecting a route to avoid kauri, stay downslope of healthy kauri and upslope of infected kauri where possible (see figure 2). This further reduces the likelihood of the pathogen entering healthy stands through downward soil movement.

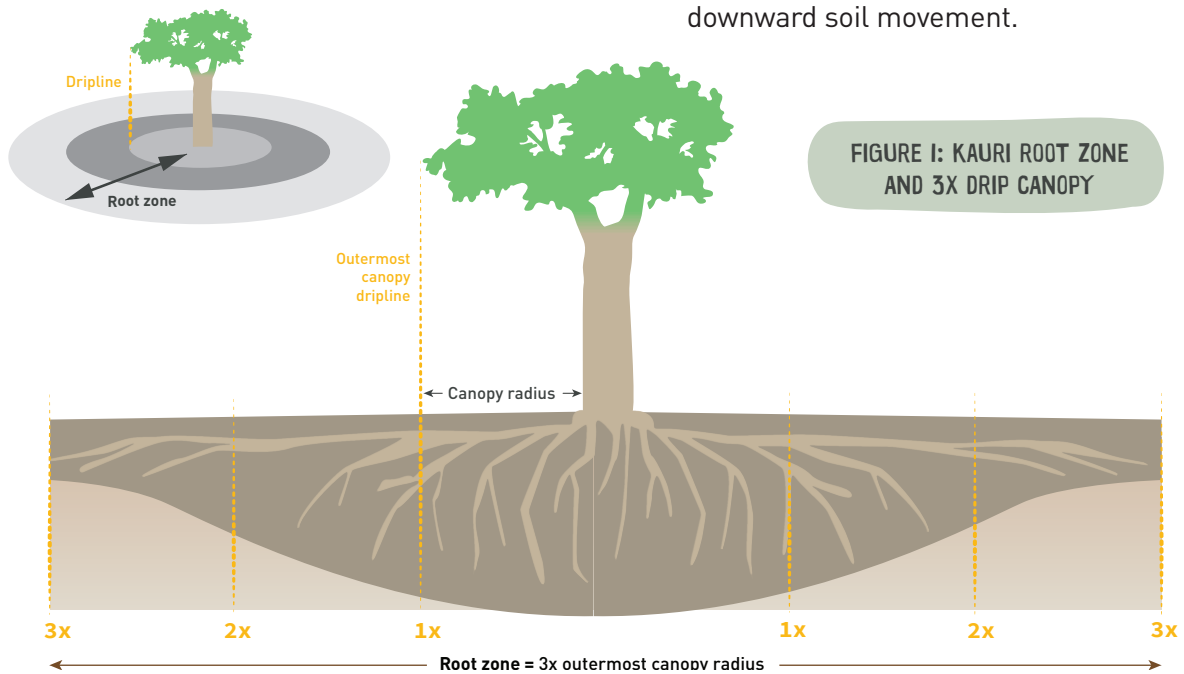
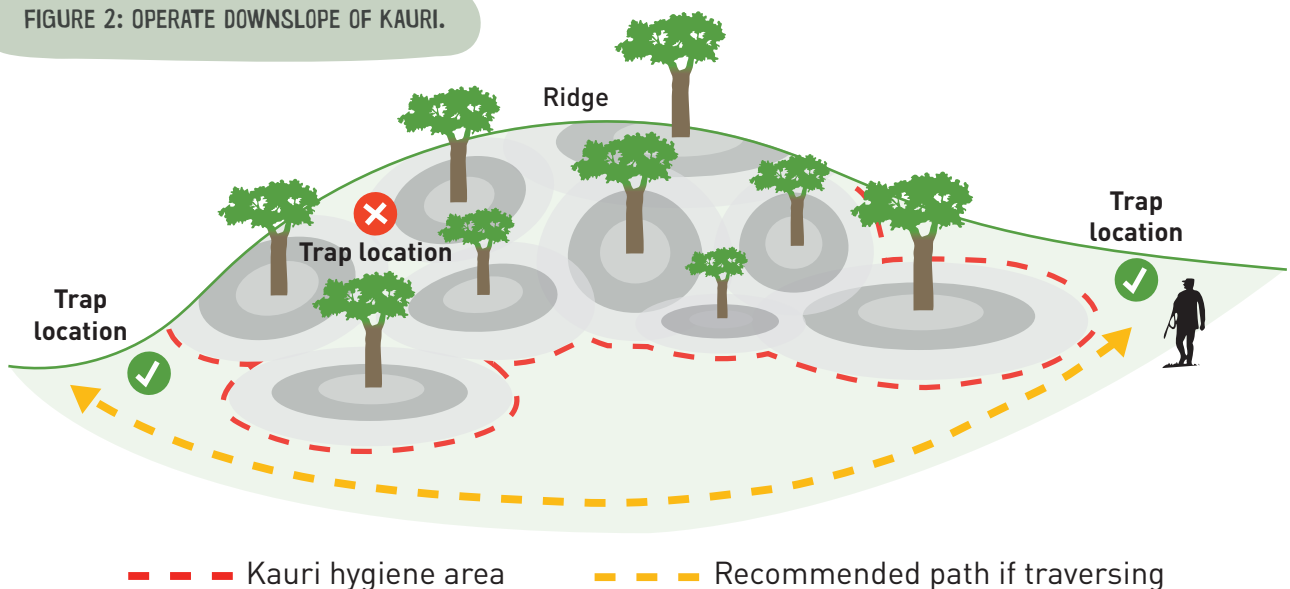


FIGURE 2: OPERATE DOWNSLOPE OF KAURI.



4. KEEP AWAY FROM KAURI IN WET CONDITIONS

Carry out your activities in dry conditions and avoid muddy areas. Reschedule activities when weather forecasts are for rain and underfoot conditions will be or are wet.

P. agathidicida spores are more active when it is wet, and muddy conditions make it more difficult to manage dirt movement. Working when it is dry underfoot is much better for protecting kauri.

5. ELIMINATE DIRT MOVEMENT.

ARRIVE CLEAN, CLEAN WITHIN, AND LEAVE CLEAN

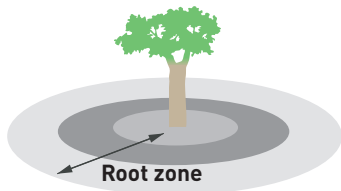
If it is not possible to avoid operating near kauri, you must apply stringent hygiene procedures. These must be undertaken **before** heading into kauri areas, **within** kauri areas and **after** leaving kauri areas.

- a) Prior to arrival, ensure that you, your footwear, clothing and equipment are dirt-free and disinfected.
- b) Keep all equipment off the ground.
 - Consider using carabiners or ropes to keep items off the ground or use single-use tarpaulin (to be disposed of) to keep items off the ground.
- c) When moving between kauri trees or stands, ensure you remove all dirt from footwear, clothing and equipment, then apply disinfectant and leave on for at least one minute. Do these actions outside the root zone of kauri (see figure 3).
 - Use disposable overshoe booties. They are an effective means of stopping dirt transfer from footwear as they provide a barrier between footwear and dirt.
 - Use disposable gloves when working with dirt within kauri root zones.
 - Do not reuse booties or gloves unless they can be heat-treated. If so, treat at a minimum temperature of 50 degrees Celsius for 24 hours. (See kauriprotection.co.nz/how-to-guides/.)

DISPOSABLE OVERSHOE BOOTIE EXAMPLE



FIGURE 3: EXAMPLE OF A KAURI STAND AND OUTER EDGE OF KAURI ROOT ZONES.



 Kauri hygiene area
*Interconnected 3x
 drip line of kauri
 stand*

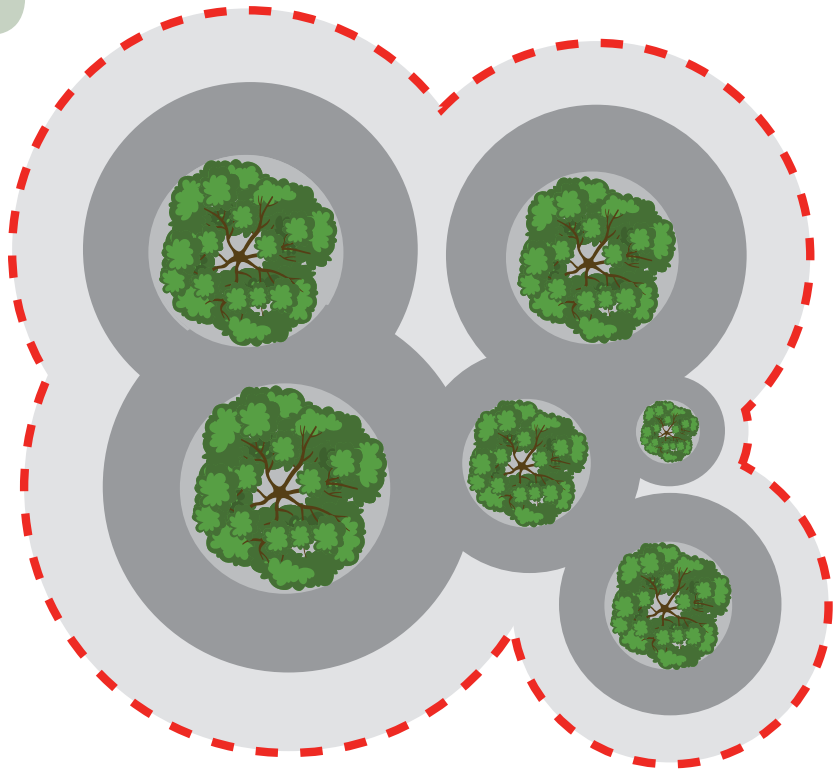
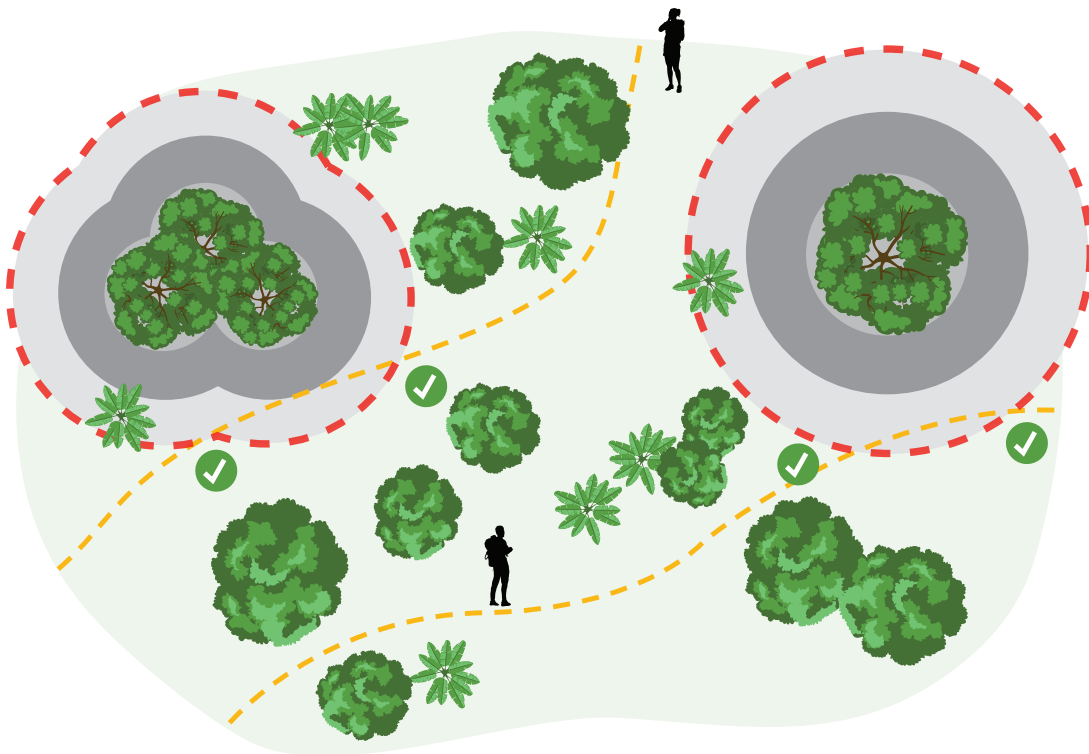


FIGURE 4: EXAMPLE OF CLEANING AREAS, FOR WHEN IT IS NOT POSSIBLE TO AVOID KAURI.



✓ Point to clean gear and/or put on overshoe booties --- Kauri hygiene area --- Path you are taking

6. REMOVE ALL DIRT THEN DISINFECT

- a) Clean/remove all dirt from all gear, equipment, machinery and people.
- b) After all dirt is removed, apply disinfectant* and leave on for at least one minute.
- c) Where possible, use heat to sterilise equipment at a minimum temperature of 50 degrees Celsius for 24 hours (see [kauriprotection.co.nz.how-to-guides](https://www.kauriprotection.co.nz/how-to-guides)).

*The disinfectant approved by the National Kauri Protection Programme is SteriGene at 2 per cent for broad-spectrum use. Methylated spirits (minimum concentration of 70 per cent) can also be used for spot treatment and cleaning of small equipment (i.e. handheld tools).

CARRY A HYGIENE KIT. USE HYGIENE STATIONS.

Always use hygiene stations where available and carry a hygiene kit. A hygiene kit should include:

- a hard brush to remove all dirt from footwear
- overshoe booties and/or disposable gloves for when working within kauri root zone (if not possible to avoid)
- a spray bottle containing disinfectant
- a disposable sealable bag to store dirty items.

Ensure there is separation between areas where you store dirty items and clean items. For example, in your backpack, have set areas for clean equipment and dirty items.

DIRTY SHOES VS DIRT-FREE SHOES.





**FOR MORE INFORMATION ON PROTECTING
KAURI HEAD TO KAURIPROTECTION.CO.NZ**