TIAKINA KAURI
KAURI PROTECTION

National PA (*Phytophthora agathidicida*) Pest Management Plan

Operational Plan

November 2022 – June 2024

Biosecurity New Zealand
Ministry for Primary Industries
Manatū Ahu Matua

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Contents

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Ko te kauri he whakaruruhau mō ngā Iwi Katoa
Kia toitū te whenua, Kia toitū te kauri.

The kauri shelters all people
So that the land endures
So that the kauri endures

1. Purpose

This Operational Plan is prepared for the purpose of implementing the National PA Pest Management Plan (NPMP) objectives, and to meet the objectives in the Biosecurity (National PA Pest Management Plan) Order 2022 and to meet the requirements under section 100B of the Biosecurity Act 1993.

The operational plan has been prepared by Tiakina Kauri, the Management Agency set up to deliver the National *Phytophthora agathidicida* (PA) Pest Management Plan. Tiakina Kauri Management Agency sits within Biosecurity New Zealand, a branded business unit of the Ministry for Primary Industries.

The term of this Operational Plan is from 30 November 2022 to 30 June 2024 and will be reviewed a year into implementation. The operational plan sets out the approach to implementation, policies, priorities and budget to deliver under the NPMP. Policies (section 5 onwards) are current as of sign-off date for this Operational Plan, with updates to be maintained on the Kauri Protection website.

2. Introduction

The National PA Pest Management Plan came into effect on 02 August 2022. This operational plan sets the work required to build a strong foundation for effective and strategic NPMP implementation.

The NPMP sets six objectives. These are to:

(a) reduce the spread of PA; and
(b) maintain areas free of PA; and
(c) reduce the impact of PA within infected sites; and
(d) locally eliminate PA within infected sites; and
(e) protect kauri with special value from PA; and
(f) facilitate controlled access to kauri forests where it does not compromise the future or protection of kauri.

These objectives should be considered in combination with the adverse effects the NPMP intends to address (see below).

This National Operational Plan seeks the alignment of management actions from a range of delivery providers. It sets out the need for knowledge-based decision making and a Te Tiriti o Waitangi grounded approach.

The use of 'Tiakina Kauri' for the management agency and programme signals a shift from the previous 'Kauri Dieback Management Programme' to Kauri Protection. An emphasis on the call to arms to protect kauri from this pathogen, and importantly not to diminish the mauri mo te kauri (lifeforce of kauri) by referring to kauri and dieback together.

The operational plan will bring together the efforts of all parties involved in the NPMP PA kauri protection work – setting collective priorities over the coming national operational plan period. It ensures appropriate accountability, capacity and capability are established to deliver the NPMP objectives. Agencies bring their own resources to the kauri protection efforts as well as the funds distributed by Tiakina Kauri. The Māori-Crown co-governance mechanism will provide oversight of all kauri protection work.

The plan identifies the importance of mana whenua fulfilling their kaitiaki roles with support from the Crown, along with the support and the continuation of existing mitigation work by agencies and land owners. Over the life of the NPMP increasing mana whenua leadership in kauri protection work will be prioritised.

The adverse effects the NPMP intends to address

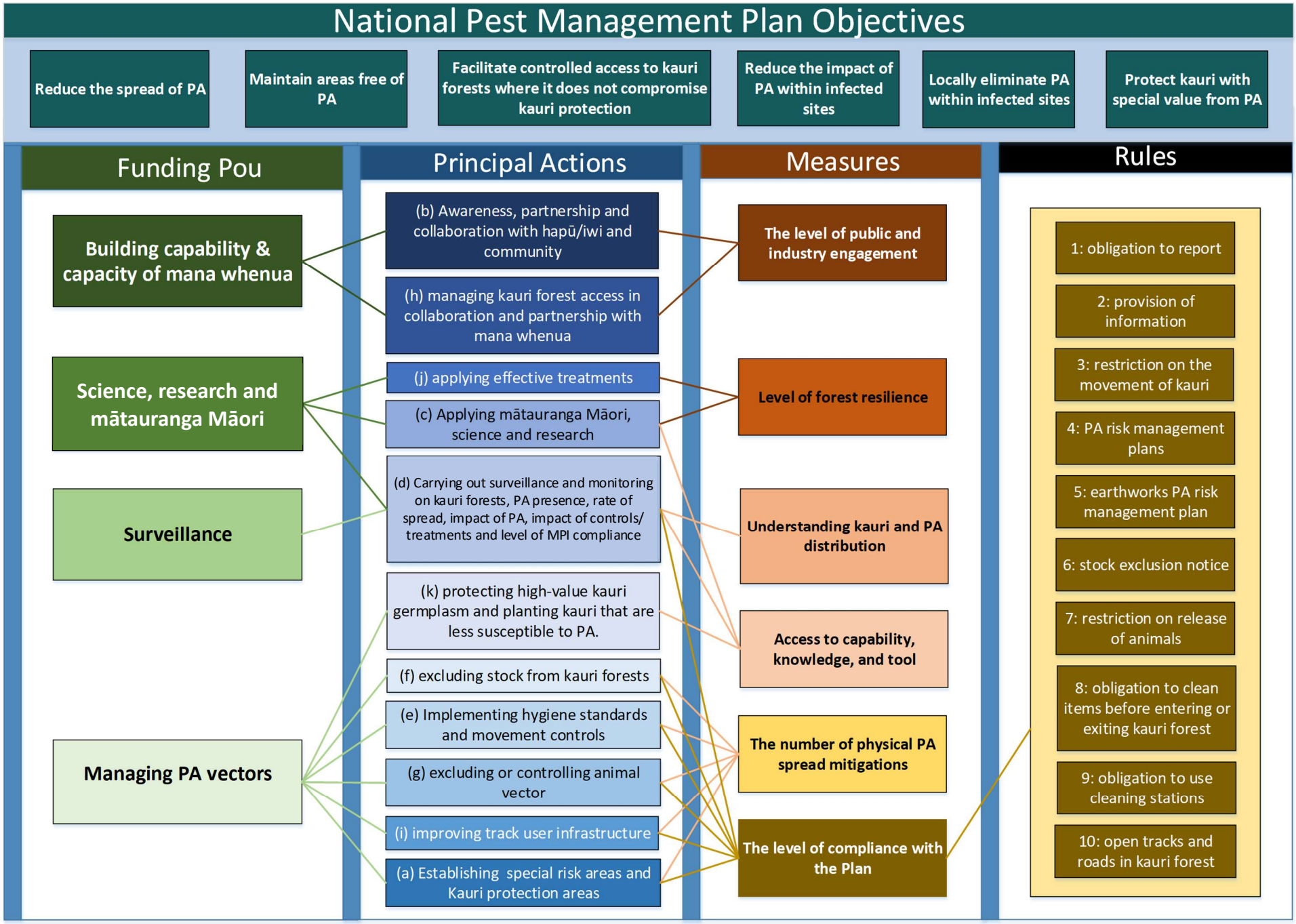
The adverse effects of PA infection and the loss of kauri that the Plan addresses are:

(a) adverse effects on the relationship between Māori, their culture and traditions, and their ancestral lands, waters, sites, wāhi tapu, and taonga; and
(b) adverse effects on the environment caused by 1 or more of the following:
    (i) loss of endemic species:
    (ii) changes in plant community structure:
    (iii) increased soil erosion:
    (iv) changes in hydrology; and
(c) adverse effects on enjoyment of the natural environment caused by restrictions imposed on recreational activities in kauri forests to minimise further degradation of the forests from the effects of PA; and
(d) adverse effects on economic well-being caused by rising emissions of greenhouse gases from the depletion of the stored carbon in kauri when they die.

NPMP implementation seeks to prevent and mitigate the effects, of PA, listed. Successful implementation requires that management approaches do not lead to or exacerbate these adverse effects.

The structure of the NPMP

The table below provides detail on relationship between NPMP components. The NPMP principal measures have been summarised and termed 'Principal Actions', to differentiate from the measures of success ('Measures'). Each principal measure/action is referenced in the applicable policy area, within this document, along with the relevant rules for that policy area (under the 'Relationship to the National Pest Management Plan' headings). Funding pou, or priorities, are also mapped against these principal measures/actions below, more detail on the pou can be found in Section 3.3.


National Pest Management Plan Objectives
Reduce the spread of PA
Maintain areas free of PA
Facilitate controlled access to kauri forests where it does not compromise kauri protection
Reduce the impact of PA within infected sites
Locally eliminate PA within infected sites
Protect kauri with special value from PA
Funding Pou
Principal Actions
Measures
Rules
Building capability & capacity of mana whenua
Science, research and mātauranga Māori
Surveillance
Managing PA vectors
(b) Awareness, partnership and collaboration with hapū/iwi and community
(h) managing kauri forest access in collaboration and partnership with mana whenua
(j) applying effective treatments
(c) Applying mātauranga Māori, science and research
(d) Carrying out surveillance and monitoring on kauri forests, PA presence, rate of spread, impact of PA, impact of controls/ treatments and level of MPI compliance
(k) protecting high-value kauri germplasm and planting kauri that are less susceptible to PA.
(f) excluding stock from kauri forests
(e) Implementing hygiene standards and movement controls
(g) excluding or controlling animal vector
(i) improving track user infrastructure
(a) Establishing special risk areas and Kauri protection areas
The level of public and industry engagement
Level of forest resilience
Understanding kauri and PA distribution
Access to capability, knowledge, and tool
The number of physical PA spread mitigations
The level of compliance with the Plan
1: obligation to report
2: provision of information
3: restriction on the movement of kauri
4: PA risk management plans
5: earthworks PA risk management plan
6: stock exclusion notice
7: restriction on release of animals
8: obligation to clean items before entering or exiting kauri forest
9: obligation to use cleaning stations
10: open tracks and roads in kauri forest

2.1 Background

Kauri in NZ

Kauri *(Agathis australis)* belongs to one of the oldest families of conifers and is one of the largest long-lived tree species in the world. The evolutionary whakapapa of kauri has been traced back over 100 million years. For thousands of years, kauri grew throughout northern Aotearoa both within broadleaf forests and as thick groves. Significant logging and burning throughout the 19th and 20th centuries resulted in 1-5% of the original kauri forest remaining. Forests throughout the north are regenerating and kauri grows naturally above a latitude of 38 degrees south (a virtual line approximately Kawhia to Tauranga).

Kauri are ecosystem engineers meaning they directly influence the environment in which they stand. Many other forest species (including animal species) depend on kauri to survive. Kauri are important to all New Zealanders and have special significance to Māori as a taonga.

The pathogen, *Phytophthora agathidicida*

Phytophthora agathidicida (PA) is the pathogen that causes the disease known as 'kauri dieback disease'. PA is a soil-borne pathogen with no airborne phase which infects kauri through its' shallow feeder roots, damaging the tissues that carry nutrients and water within the tree, effectively starving it to death. There is currently no proven cure or long-lasting treatment, and most infected kauri will die.

Transmission, detection and impact of PA

PA is spread through soil movements and may be moved by tiny amounts of soil – including soil carried on soiled/dirty footwear, animals, equipment, and vehicles – along with natural water movement. PA sporangia (reproductive spores) are formed in moist conditions, and zoospores (the active life phase of the organism) are released and swim towards kauri roots. Oospores, the long-lived phase of the organism, may survive in the soil for months or possibly years without a 'host'.

Above-ground symptoms of PA infections can first appear months, years and even decades after initial tree infection, with longer latency periods for larger trees. Latency is the time between the pathogen infecting the host and the disease becoming visible. Infected kauri may show physical symptoms such as canopy thinning or bleeding lesions on the base of the trunk, a tree can be infected and not show any symptoms of the disease. PA is microscopic and infects the tree beneath the ground, meaning it is not visible to humans.

Due to symptom latency and limitations in detection sensitivity, an area that has not had a positive identification for the pathogen it is classed as 'PA undetected', and where the pathogen has been found it is classed as 'PA detected'. At present PA may only be confirmed by a positive soil sample.

There is no known cure for the pathogen, meaning the long-term survival of kauri ecosystems is dependent upon the prevention of PA spread to forests that are not currently contaminated. Actions to date have been designed to reduce the movement of the pathogen (e.g. track improvements; animal control), manage the disease (i.e. phosphite) and invest in operational research. Prioritisation of vector management approaches is constrained by a limited understanding of the host population, pathogen and disease distribution, this means more surveillance and baseline monitoring is a priority for the programme. Figure 1 is a map showing our current understanding of kauri distribution with PA detected.

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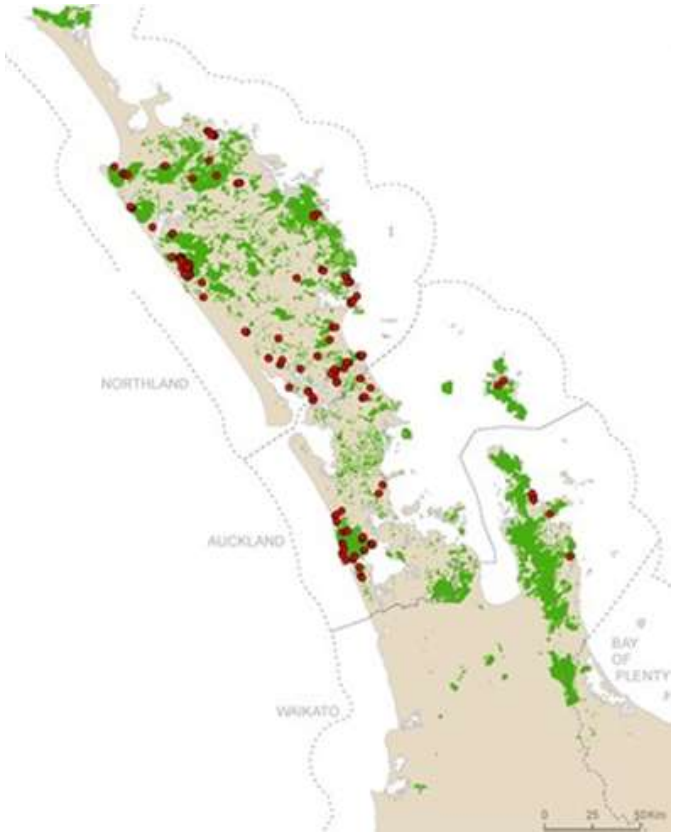
Figure 1: known distribution of kauri forests (green) and PA detections (red circles)



3. Implementation Approach and guidance

3.1 Geographic Application of the National Pest Management Plan

The National PA Pest Management Plan applies to two geographical regions, nationally (Rules 1 - 3) and in kauri lands (Rules 4 – 10) and is applicable to all land tenure.

Kauri lands means within the boundaries of the Northland Regional Council, Auckland Council, Waikato Regional Council and Bay of Plenty Regional Council.

When the National Pest Management Plan also refers to **kauri,** it means any living kauri plant (*Agathis australis*) in place, or for planting or propagation, including containerised, field-grown, and tissue culture plants, and parts thereof, including seeds and germplasm.

When the NPMP refers to a **kauri forest**, it means a forest or bushland ecosystem, within kauri lands, that contains:

- more than 1 kauri; or
- land being regenerated with planting for the purpose of establishing, or revegetating, a kauri forest ecosystem; and
- includes any land within the kauri hygiene zone of any kauri tree on the edge of the forest or bushland ecosystem.

References to a **kauri hygiene zone** means 3 times the maximum radius of the canopy dripline of a kauri tree (as demonstrated in Figure 2 below).

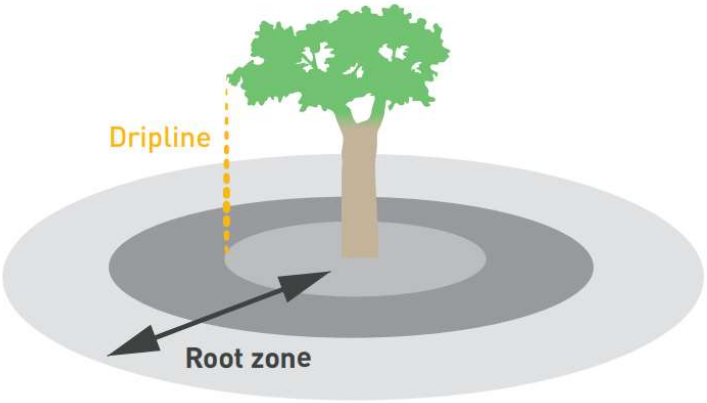


Figure 2: the kauri hygiene zone of a kauri tree

3.2 Implementation Principles for 22/23

The following four principles will guide all parts of the implementation of the Operational Plan. These were developed by Tiakina Kauri based on a wānanga with implementation partners in April 2021 and have been adapted based on the lessons learned over the past year and key objectives looking forward. They are to be considered in combination and demonstrate the mindset and behaviours the program orients to in NPMP delivery.

1. Giving effect to Te Tiriti o Waitangi
2. Kauri at the centre
3. Mahi tahi - working together to protect kauri
4. Knowledge-driven, strategic and adaptive.

3.3 The Four Pou

Tiakina Kauri will be an enabling and coordinating body, providing national direction for the achievement of the NPMP objectives through active partnership with mana whenua in collaboration with regional councils and the Department of Conservation.

NPMP success requires a strong presence in kauri lands – especially those with local knowledge and connections to the people and the land. It also requires specialised skillsets, in the sciences, surveillance and mātauranga Māori. The National Pest Management Plan funding plan is therefore an important tool for prioritising and enabling effort and actions. Funding is guided by the four investment pou detailed below.

Investment Pou

1. Building capability and capacity of mana whenua to lead kauri protection locally.
2. Increasing monitoring of, and aerial surveillance over, kauri forests to support strategic kauri protection decisions.
3. Leveraging scientific research and mātauranga Māori as part of operational management approaches. *"We reinforce the balance between mātauranga and science as equal in both knowledge and delivery".*

4. On the ground mitigation works and development of guides, policies and standards – to prevent movement of the pathogen and protect the trees with the involvement of people.

The pou are connected and reciprocal. In the lead-up to implementation, emphasis was placed on pou 2 in terms of understanding where the pathogen is located through aerial surveillance and ground monitoring (as part of kauri protection plans). However, to meet these needs the resources allocated also contribute strongly to Pou 1 – building capability & capacity.

These connections are fluid with emphasis on each pou moving over the course of the NPMP implementation as science, research and mātauranga Māori advance our understanding of both the pathogen (PA) and the disease.

Over the National Operational Plan Term
Over the coming term there will be a focus on:

- education and awareness, to ensure individuals and organisations are aware of their role in kauri protection and the NPMP requirements (Pou 4).
- Ensuring knowledge-based foundational policies and processes are in place for all delivery areas (all pou).
- Establishing KPIs across the four delivery areas, in line with the NPMP measures (to be delivered by 30 June 2023).

3.4 Roles in Implementation

The kauri protection work spans multiple organisations, with the work of those detailed below overlapping and extending beyond NPMP implementation - involving a range of skillsets, knowledge-sets and regulatory tools that can be (and are) put towards the programmes aims.

A key deliverable within this national operational plan period is a product detailing the broader kauri-related regulatory environment and detailing the varying roles and responsibilities within both NPMP implementation and the wider kauri protection programme of work.

Below (Table 1) is a high-level indication of works undertaken by the wider kauri protection network, known as te whānau whānui o te kauri, towards the NPMP objectives. These are subject to ongoing discussion and agreements amongst parties – as part of the overall deliverable referred to above.

TABLE 1: Indicative roles in kauri protection and NPMP implementation

Structure		Who	Roles
National	Kauri Protection Co -Governance Group	Co-Governance model. Regional representation, skills, knowledge and authority to make decisions on strategy	• Lead the strategic direction of the NPMP • Endorse the National operational plan • Report to Minister through biosecurity New Zealand • Have oversight over the Kauri Protection Programme
	Management Agency	Tiakina Kauri - the kauri protection team in Biosecurity New Zealand	• Lead the development of the NPMP and annual operational plans, lead the implementation of the NOP • Co-ordination of national activities, funding and national direction of effort • Build collaboration in with te whānau whānui o te kauri. • Lead engagement and communication with public including behaviour change • Lead science transfer to operational management • Lead authorised persons' training and accreditation programmes • Lead on compliance and prosecutions under the NPMP • Support co-governance group and other committees • Report on all aspects of kauri protection
	Department of Conservation	Regional and District Teams and National teams (including: Plant Pathogens Team, National Compliance Team, Health and Safety Unit)	• Involvement in regional co-ordination, compliance and implementation • Contribute to the PA knowledge base and toolkit through the sharing of approaches and data • Ensuring all DOC people implement effective hygiene protocols and NPMP requirements • Actively manage kauri disease on Public Conservation Land • Actively using regulatory tools and levers (e.g. Conservation Act 1987) to manage risk of kauri disease (including forest and track closures) • Educate, advise and support on NPMP requirements • Contribution to governance and various advisory groups • Identify priority areas within regions for kauri protection action to occur.
	[Interim] Operational Advisory Group	A body representative of te whānau whānui o te kauri.	• Provide advice to the Tiakina Kauri on NPMP policies, standards, enforcement and guidelines • to build collaborative effort and problem solve.

Structure		Who	Roles
National (cont)	Technical advisory Groups	Experts with knowledge sets specific to the advisory area	• Provide expert advice for direction setting and implementation. • Input into the supporting strategies including the Science Strategy. • Work with MBIE and universities in relation to the funding of kauri research.
Regional	Regional Councils ***(subject to formal agreement over the operational plan term)***	Northland Regional Council Auckland Council Waikato Regional Council Bay of Plenty Regional Council	• Identify priority areas within regions for kauri protection action to occur • Carry out physical mitigations for PA spread on land they own or manage • Apply or support mātauranga Māori approaches to kauri protection • Educate, advise and support on the NPMP requirements • Carry out and report on compliance activities in line with an agreed national compliance plan • Contribute to the PA knowledge base and toolkit through the sharing of approaches and information • Mana whenua - Lead on mātauranga and rongoā Māori approaches • Regional Councils - Utilise regulatory tools available for the protection of kauri, where agreed • Contribution to governance and various advisory groups
	Mana whenua groups	Hapū & iwi at place, collaborative mana whenua groups at regional level	
	Land and business, owners and managers	Kaitiaki, land owners and managers, business owners and managers	• Play a leadership role in education and risk mitigation practices in regard to activities and areas they have responsibility over
	Community groups	Various non-profit groups and organisations	• Advocating and educating on kauri protection • Performing on the ground mitigations, safely and with permission of land owner/managers.
	Territorial Authorities	21 territorial authorities in Kauri Lands	• Manage the risk posed by land disturbance and fulfil biodiversity protection roles as per legislative responsibilities

Work has begun to establish a rōpū kaumātua to provide direction and guidance to meet our intent particularly around Te Tiriti o Waitangi and mātauranga Māori. More detail on this group can be found in the 'Programme Structure' section. Over time, networks will be established between mana whenua, local community groups, land owners/managers with kauri, regional and district councils and DOC. Regional groupings will be established to meet regularly to discuss region-specific priorities (e.g. feral animal control), promote the value and protection of kauri locally and build and sustain community connections.

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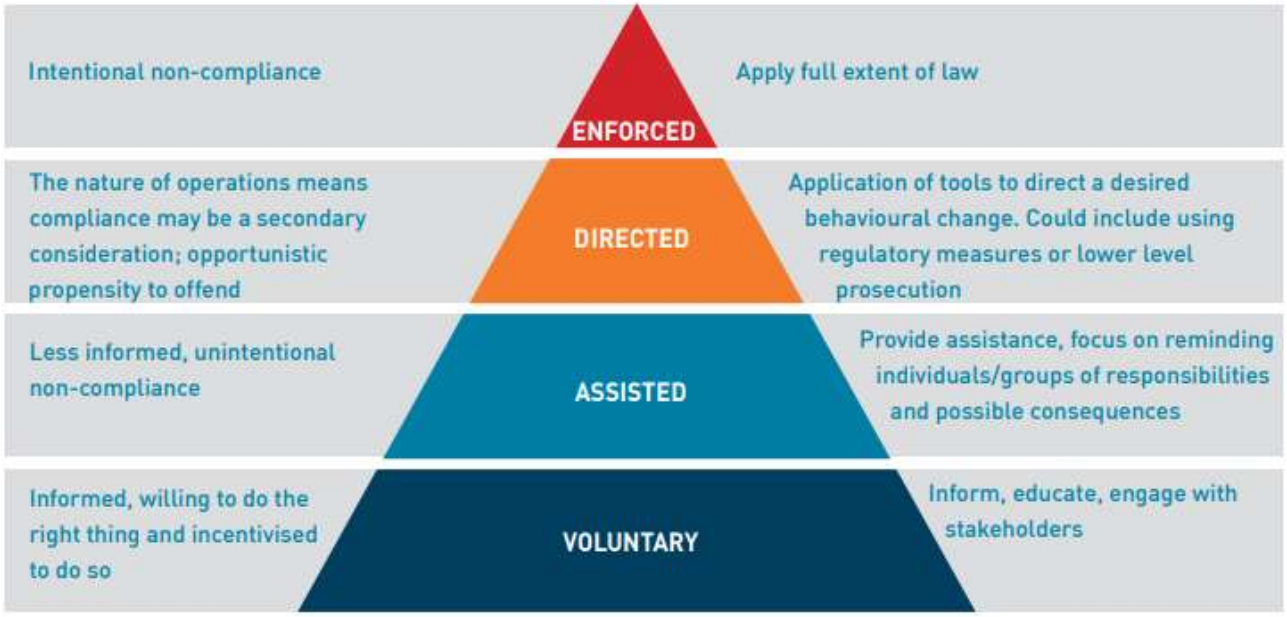
3.5 Compliance

The regulatory approach for the NPMP will follow the VADE model, which breaks down compliance into: Voluntary compliance, assisted compliance, directed compliance and enforced compliance (Figure 3).

Figure 3: The VADE model of compliance



The approach taken over the term of the plan will be to inform, educate and engage with stakeholders – with the aim to increase awareness of the NPMP and in turn, voluntary compliance. This approach is further detailed in Section 9 (Communication and Awareness). In cases where non-compliance is serious (high risk or high impact) or repeated, other actions will be considered.

National Compliance Plan

Meeting the NPMP objectives requires a national compliance plan, which takes into account national priorities and local contexts. This plan will be delivered by FY23, considering regional priorities and resources and detailing national processes and standards for appointing authorised persons and for carrying out NPMP compliance and enforcement activities. This will be developed with regional councils, the Department of Conservation and Māori.

Over the coming term Tiakina Kauri will:

- Establish a standardised authorised person training and accreditation programme
- Accredit authorised persons in each kauri land region
- Establish a national kauri protection compliance plan in collaboration with delivery partners, by 30 June 2023.

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Policy Areas

5. Te Tiriti o Waitangi

Desired outcome: Māori are partners in, and participate in, all levels of kauri protection and NPMP implementation.

Meeting NPMP Objectives:
Te Tiriti o Waitangi must be considered in all aspects of NPMP implementation, this means actions towards the objectives are done in partnership with Māori.

Background:
Kauri trees are taonga, holding significant cultural and spiritual value to Māori. Kauri are descendants of the atua Tāne-mahuta 'god of the forest' and are connected to Māori through whakapapa (genealogy) as ancestors. For mana whenua of kauri lands, the health and welfare (mauri) of kauri forests are often described as inextricably linked with the health and wellbeing of their people.

The kauri protection programme seeks to give effect to Te Tiriti o Waitangi. This means that Māori are actively included in the decision-making and on the ground protection work, for the prevention of the spread of PA and the protection of kauri.

Principles for implementation:
In ensuring programme decision making meets its Te Tiriti o Waitiangi obligations, the following principles are considered:

- The Rangatiratanga Principle – Māori to retain rangatiratanga over their resources and taonga and the Crown's duty of active protection
- Permission, partnership, participation, protection
- Kaitiakitanga
- Mahi tahi
- Valuing mātauranga Māori – in leadership, communications and operations

Relationship to the National Pest Management Plan requirements

The NPMP includes a description of the adverse effects of PA and the loss of kauri that the Plan addresses, which include:

Adverse effects on the relationship between Māori, their culture and traditions, and their ancestral lands, waters, sites, wāhi tapu, and taonga

It is important that we consider these adverse effects, not only in relation to damage caused by PA, but also in relation to the potential damage caused by NPMP implementation that is exclusionary to Māori or culturally inappropriate use of NPMP tools. To meet the obligations of Te Tiriti o Waitangi and to avoid causing or exacerbating the adverse effects listed above, Tiakina Kauri prioritises the building of capability and capacity in those mana whenua groups wanting active involvement in kauri protection. This is with the explicit aim of bridging the resource and experience gap between government agencies and mana whenua, to support a true, equitable partnership.

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Principal measures (listed in Section 9(1) of the NPMP) to achieve objectives of the plan include the below:

- growing awareness, partnerships, and hapū - and iwi-led collaboration and engagement across the community in the management of PA; and
- applying mātauranga Māori, including cultural harvest, and the results of science and research to the management of PA; and
- managing kauri forest access in collaboration and partnership with mana whenua;

Implementing the NPMP in partnership with Māori is essential to the success of the NPMP objectives. This has and will be embedded into the programme in the following ways.

5.1 Programme structure

The programme structure is intended to reflect the partnership approach aspired to by the programme. This is done by the following mechanisms:

Co-governance group

The Kauri Protection Co-Governance Group provides strategic oversight to the kauri protection programme, which includes the implementation of the NPMP and national kauri protection strategy. The co-governance group has oversight of all management agency funded kauri protection work undertaken in kauri lands. The group has 50% Māori representation. One co-chair is Māori, the other a senior official. This provides for both a Te Ao Māori and a Crown perspective at the highest level which will benefit the management agency (Tiakina Kauri) and the programme to deliver the operational plan as treaty partners.

Rōpū Kaumātua

Work has started on the formation of a rōpū kaumātua to provide leadership and direction to the kauri protection work programme to meet its intent, particularly around Te Tiriti o Waitangi and mātauranga Māori. The group will ensure that research priorities and methods, protocols, policies and guidance is tika (right) and pono (has the true intent). Members will be from across kauri lands and will meet with the Minister of Biosecurity and the Minister of Conservation one-to-two times annually.

On the ground

Mana whenua continue to be given opportunities to participate in the implementation of the NPMP. Building on their knowledge and experience by increasing skillsets in monitoring and surveillance, physical spread mitigations, wild animal management, track upgrades and other activities needed for a sustainable kauri protection plan. The number of individuals and groups that can lead on these functions will increase as a result of the 'Building capability and capacity of mana whenua' pou.

Over the National Operational Plan term:

Over the NOP term, Tiakina Kauri will establish the Rōpū Kaumātua group, ensure the co-governance group has full membership, and ensure mana whenua are engaged with the programme across kauri lands.

5.2 Building Capability and Capacity of Mana Whenua

Background

The programme has a focus on supporting mana whenua to play a leadership role in kauri protection within their own rohe. The investment in people and tools, primarily in the form of training and

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equipment needed to operate within the ngahere (forest) builds a strong foundation to achieve the work.

Over the past year, numerous wānanga have occurred primarily in Te Tai Tokerau (Northland), establishing relationships between mana whenua groups and providing advice on monitoring and surveillance, mapping tools, health and safety, hygiene measures and wild animal management. Funding has been provided to 13 mana whenua organisations (both iwi and hapū). This is either to develop or continue the work in their ngahere - applying skills, knowledge and networks and building the capacity and capability in regard to kauri protection and NPMP implementation.

Process of engagement

Delivery of the objectives of the NPMP is to, in part, to reduce the adverse effects of PA on the relationship between Māori, their culture, and their traditions on ancestral lands, waters, sites, wāhi tapu, and taonga.

Access and management of these areas will require extensive engagement with mana whenua.

Over the past year, hui were held to support work in a large ngahere (Puketi) with shared tribal boundaries, gaining permission to work with individual hapū/iwi and meeting as a collective to work together. This included:

- A kauri community open day in collaboration with the Puketi Forest Trust, DOC, and Council hosted by mana whenua.
- A hui between acknowledged experts in both western science/research and mātauranga Māori who agreed that both knowledge bases have equal value providing more knowledge and solutions to halt the spread of the pathogen in Puketi.
- A hui with kaumātua and kuia who supported the transmission of mātauranga Māori in Puketi Forest.
- A wananga led by a kauri rongoā expert to share their work and mātauranga working with kauri and the wider ngahere.

Meeting kanohi ki te kanohi (in person) has proven invaluable, providing opportunities for whanaungatanga, to discuss kaitiakitanga and the genuine offer to mahi-tahi to support each other's efforts to protect Kauri and the ngahere as a collective is a positive for the Tai Tokerau region.

Approach to mana whenua engagement:

The approach to engagement values:

- meeting "kanohi kitea" (to have a physical presence, be seen, represent) in their rohe is the preferred engagement channel
- knowledge and understanding of tikanga and kawa variance across kauri lands acknowledges and respects all rohe
- gaining permission to work as partners is a key first step, providing a platform for a relationship based on te Tiriti o Waitangi
- engaging with both iwi and hapū. This acknowledges that hapū are often active as mana-whenua kaitiaki in their ngahere.
- engaging at the appropriate level. Senior leaders engage with Māori leaders much the same as they would engage with other leaders of large organisations.
- working together to produce kauri protection plans that meet their place-based needs
- providing options in meeting the NPMP objectives.

Over the National Operational Plan term:
In the coming term, the intention is to support those that have received funding over the 20/21 funding year to achieve their goals (this investment was primarily made in Te Tai Tokerau) and focus efforts on building capacity and capability in Tamaki Makaurau, Pare Hauraki, Waikato-Tainui, Maniapoto, and Tauranga Moana.

6. Managing the pathogen, vectors and risk

Desired outcome: The risk of PA spread due to the activities of people and animals is managed strategically and effectively, with everyone knowing the part they need to play to ensure kauri protection.

Background
PA is a soil-borne pathogen, with the movement of contaminated soil and soil–water being the main vector mechanism. The risk of PA spread is proportional to the volume of soil moved and the frequency and distance of movement. By far the greatest amount of movement of the disease is attributed to human activities, with a number of observational studies implying that the movement of contaminated soil on people and associated vehicles and equipment, represent the greatest risk of spread. This risk can be mitigated by changes in behaviours (e.g. hygiene practices) and improvements in infrastructure (e.g. tracks and roads).

Animal movement is also implicated in PA spread, particularly instances where animals are moving between forests and/or able to travel considerable distance within the forest, such as stock under-grazing and the movement of ungulate (hooved) pest species.

Managing specific risks are the responsibility of a range of individuals and organisations, including:

- Forest visitors and workers
- Plant producers
- Forest owners and managers
- Stock owners and managers
- Earthworks and infrastructure procurers and companies.

These are broken down further in the sections following.

Considerations for action
Processes for prioritising where applying physical mitigations will provide most benefit will be established by Tiakina Kauri. This will be a risk-based approach and will consider:

- the best information available at the time
- the likelihood of PA spread
- the impact PA spread would have to the area i.e. the impact on spiritual (including Māori cultural values), social, environmental and economic values
- what mitigation methods are effective and appropriate, given the context i.e. environmental, economic or cultural.

Over the National Operational Plan term:
A goal over the National Operational Plan term is to assess our existing vector and risk management knowledge pool, identify what knowledge can be better shared across the kauri regions (e.g. through the establishment of national standards, protocols and guidance) and where key gaps in knowledge and process exist. Gaps will be fed through research prioritisation (Section 8.3).

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The programme intends to deliver a comprehensive, scientifically-sound and culturally appropriate toolkit over the first five years of the Plan, to guide and inform risk and vector management performed by the management agency, its implementation partners and those living, working near/with or visiting kauri (including those detailed in this section, below).

6.1 Forest visitors and workers

Desired outcome: Forest visitors and workers are invested in kauri protection, proactively considering and managing risk factors for PA spread introduced by their activity.

Background
Activities within kauri forests, such as hiking, mountain biking, hunting, and wild animal management, can lead to PA being introduced via ground-touching items such as shoes, vehicles and equipment. The only way to avoid the risk of introducing PA spread is to carry out activities in an alternate location where there are no kauri present. If this is not possible, risk can be mitigated by choosing a location where PA has not been detected, consciously avoiding the hygiene zone of a kauri tree (where possible) and carrying out effective hygiene practices - guidance on hygiene best practice can be found on kauri protection website. The NPMP sets the minimum cleaning requirements when accessing kauri forests - this is detailed below.

Relationship to the National Pest Management Plan:

The National Pest Management Plan has an objective which values New Zealanders' time spent in kauri forests, in balance with the risk posed by their activities:

facilitate controlled access to kauri forests where it does not compromise the future or protection of kauri.

Two rules within the NPMP directly reference the need to clean ground-touching items, Rule 8 and Rule 9.

Plan rule 8: obligation to clean items before entering or exiting kauri forest (1) Immediately before entering or exiting a kauri forest, a person must clean any risk item that is in their possession. (2) The person must clean the risk item so that visible soil and organic matter is removed.

Rule 8 applies specifically to situations where an individual is going off track, or where track surfacing allows items to come into contact with the forest floor. A priority for awareness, education and enforcement strategies for Rule 8 are those groups and activities regularly engaging in off-track forest access (such as hunting and wild animal management activities), though all off-track access creates risk of PA spread. Figure 4 provides an example of compliant and non-compliant footwear under Rule 8.

Failure to comply with the rule can incur an infringement fee of $300 and may be result in prosecution.

Hygiene kits for off-track visitors and workers
For ground-touching items to be cleaned immediately on entry and exit of a forest, cleaning products will need to be held in proximity to access points. This can be achieved by carrying a hygiene kit when undertaking off-track activities. The recommendation is that this kit contains (at minimum) a hard brush to remove soil and a bottle of water (preferably containing an approved disinfectant – information on this can be found on the kauri protection website). When working within a kauri hygiene zone, overshoe booties should also be considered.

Figure 4: Non-compliant (left) and compliant (right) shoes at off-track entry and exit

Plan rule 9: obligation to use cleaning stations
(1) A person who uses a track or road in a kauri forest must clean applicable items at each cleaning station they pass.
(2) The item must be cleaned so that visible soil and organic matter has been removed.
(3) An **applicable item** is an item that the cleaning station is designed to clean.

Cleaning stations are installed in strategic locations, particularly at the entrance/exit of kauri forests that see high visitor numbers. Installation of these stations mitigates the risk of PA spread in both on and off-track forest access and often act as a visual queue for the public of kauri protection aims and obligations. The NPMP requires that cleaning stations must be used when encountered – failure to do so can incur an infringement fee of $400 and may result in prosecution.

Over the National Operational Plan term:
Undertaking awareness campaigns targeting forest visitors is a key objective over the National Operational Plan term, as well as updating and publishing best practice guidance and national standards where appropriate. In addition, Tiakina Kauri will begin the design of an accreditation system that will actively support people to operate safely in a kauri forest through training and recognition of skill.

6.2 Plant producers

Desired outcome: All growers of kauri know how to do so safely, by actively managing the risk of PA spread and having the means to trace an infection, if found.

Background
Nursery production and plant distribution are inherently associated with numerous biosecurity risks, including PA. Nurseries in other countries have contributed to the spread of *Phytophthora spp.* because of growing conditions at nurseries (e.g. high moisture and warm temperatures) favour pathogen growth. Additionally, results of dieback surveillance to date suggest that some of the current

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PA distribution in New Zealand may be due to historic movement of kauri seedlings and one nursery has already been found to be infected with PA. As such, carefully planned hygiene practices, recording practices and targeted testing practices are required to reduce the risk of plant production premises vectoring PA.

Relationship to the National Pest Management Plan:

An NPMP principal measure of achieving the objectives set out is:

> Implementing hygiene standards and programmes, and imposing movement controls on risk items that are, or may be, capable of contributing to the spread of PA.

The NPMP also contains a rule that places specific requirements on plant producers, detailed below.

Plan rule 3 - restriction on the movement of kauri

Rule 3 introduces the requirement for plant producers who are growing or propagating kauri to have, and operate in accordance with, a production plan. These requirements are detailed below.

1) A production plan must include practices and procedures to ensure that—
   a) any person at the plant production premises involved in the production or propagation of kauri is informed about—
      i) PA; and
      ii) how PA spreads between plants; and
      iii) how to identify the symptoms of PA in—
         (1) kauri; and
         (2) if applicable, alternative PA host plant materials; and
   b) kauri cones and seeds collected are—
      (i) free from soil, invertebrates, water, and other organic matter; and
      (ii) from a place where PA has not been detected; and
      (iii) from a place where any kauri trees are in good health and are not showing any symptoms of PA; and
   c) growing media used for kauri production or propagation—
      (i) does not originate from a kauri forest; and
      (ii) has not been mixed with an unknown source of growing media; and
      (iii) is not reused for plant production or propagation; and
   d) containers, tools, and surfaces used for kauri production or propagation are cleaned and sterilised before reuse; and
   e) seed-sowing and potting is undertaken in batches; and
   f) there is documented weekly monitoring and inspection of kauri for PA symptoms; and
   g) kauri remain on the premises for no less than 3 months after final potting; and
   h) while kauri remain on the premises in accordance with paragraph (g), they—
      (i) are not mixed with other batches of plants; and
      (ii) are kept away from other propagation areas; and
   i) end-of-process PA testing is conducted for any batch of kauri showing signs of any disease or sickness by a laboratory that is independent of the plant production premises; and
   j) records for paragraphs (f) to (i) are kept for a minimum of 3 years and can be provided on request under clause 16.

Each plant producer growing kauri must have a production plan. A plant producer is any person or organisation growing kauri for movement off the premises – this includes commercial and community nurseries and those that are growing kauri for gifting, sale and offsite revegetation.

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The objective of a production plan is to detail how the spread of PA will be prevented between plants at the production premises and out of the production premises to other locations (including homes, forests and parks). Plant producers must provide the management agency with a copy of their production plan, and information that records how the person has operated in accordance with that plan, within 1 week of the agency requesting the plan and information.

Nurseries who are Plant Pass certified to the Plant Pass Core Standard and the PA (Kauri) Schedule will comply with the production plan requirements of this rule. Best practice guidance for plant producers, which can support the development of an effective production plan, can be found on the kauri protection website.

Signs of sickness and disease (i) and minimum holding periods (g)

When a batch of kauri are showing signs of sickness batch testing is required prior to kauri being moved off the plant production premises. For trees, sickness generally expresses as yellowing and thinning leaves, bleeding gum and/or dead branches. Symptoms of sickness and disease in young plants involve general ill thrift, including yellowing and dropping of leaves, followed by a rapid decline. Younger plants (e.g. seedlings and saplings) tend to succumb to the disease relatively quickly, for this reason holding kauri on the premises for a minimum of 3 months is an important risk mitigation measure, as well as an NPMP requirement.

Batching (e)and testing (i)

Rule 3 requires all kauri grown are split into batches, with batches kept separate from one another. If a batch of kauri is showing signs of disease or sickness, soil testing (baiting and plating) can be done by approved service providers. Research is underway to develop a best practices protocol for testing batches of plants. If you require a test, please contact the management agency.

There is no minimum or maximum batch size, though a plant producer should consider 1) the risk of an entire batch being contaminated and therefore unsuitable for sale and 2) the cost of PA testing for each batch should multiple batches show signs of sickness.

Kauri is engaged in ongoing research to optimise diagnostic testing for PA, in line with Pou 3 and the identified research priorities (Section 8.3), testing protocols will be published on the Kauri Protection Website once completed.

A Chief Technical Officer must provide permission under Section 52 and 53 of the Biosecurity Act 1993 for any batch testing of plants/soil and contaminated material to be moved offsite. If a test returns a positive result, please contact your regional council or the management agency (if outside of kauri land regions).

Alternative PA host plant materials

Investigation is ongoing as to whether there are plant species that can act as alternative hosts of PA. At present, there are no confirmed alternative hosts. Up-to-date information on confirmed alternative hosts will be added to the science stocktake on the Tiakina Kauri website as reports become available.

Over the National Operational Plan term:

Over the coming term the aim will be on:

- education and awareness, ensuring all major native plant producers are aware of and implementing the requirements of the National Pest Management Plan
- continued improvement of the standard operating procedures for testing, hygiene practices and PA decontamination based on on-going knowledge gathering.

6.3 Kaitiaki, land managers and owners

Desired outcome: Forest owners and managers have the knowledge, infrastructure and procedures in place to act as effective kaitiaki (guardians) of their kauri and are sharing information that supports effective PA spread management.

Background
Owning, occupying or managing land containing or bordering kauri forest means taking into consideration kauri protection and the NPMP requirements.
These can include (but are not limited to):

- reporting suspected disease in kauri
- installing and maintaining risk mitigating infrastructure (e.g. tracks, road surfacing and hygiene stations)
- having a plan on how to prevent the introduction or spread of PA on your property
- managing pests in your kauri forest
- managing the risk posed by stock grazing on the property
- avoiding earthworks around kauri trees where possible (and have a plan for mitigating the risk if not).
- Cleaning risk items when entering and exiting forests (as described in Section 6.1)

These responsibilities are described in more detail in the sections below.

Management approach:
In working with kaitiaki, forest owners and managers, a collaborative and enabling approach is to be taken – with a focus on providing information and support for private, public and Māori land owners to be carry out their responsibilities under the NPMP. The approach will be risk-based and take into consideration local and geographical contexts, including mātauranga Māori considerations and approaches.

Support for installing risk mitigating infrastructure
NPMP funding has been allocated to support land owners/managers to install physical mitigations such as fencing installation and track upgrades – in line with the objectives of funding Pou 4. This will be delivered by QEII and councils, among others.

6.3.1 Reporting requirements

Key to understanding the distribution of PA and to effectively managing its spread is knowing where PA is currently present. As such, the NPMP introduces a responsibility to report PA symptoms when they are recognised.

Plan rule 1: obligation to report

(1) An occupier of land who recognises that a kauri on the land is exhibiting any symptoms of PA must, as soon as is reasonably practicable, report the symptoms and the location of the kauri to the management agency, an inspector, or an authorised person.

(2) Subclause (1) does not apply to an occupier who knows that the management agency is aware that the tree is or may be exhibiting symptoms.

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Symptoms of trees with PA infection may include:

- Bleeding gum
- Yellowing of leaves
- Canopy thinning
- Dead branches.

Additional detail (including photos) can be found on kauri protection website. It is important to note that these symptoms may be caused by several other causes (including stress from drought, disturbance and animal browsing), so the presence of one or more of the above does not assure pathogen presence.

Once symptoms are reported, the Management Agency or authorised persons may have additional questions. If so, the requests will be in line with Rule 2.

Plan rule 2: provision of information

1) A person must provide the management agency, an inspector, or an authorised person with any information of a kind described in subclause (3) that is requested in writing by the management agency, inspector, or authorised person.
2) The person must provide the information within the time specified in the request, which must be reasonable and not less than 48 hours from the time the request is made.
3) The information is any information about—
   (a) kauri trees, including dead kauri trees, or any alternative PA host plant material; and
   (b) soil or growing medium that has or may have come into physical contact with a kauri tree or alternative PA host plant material; and
   (c) machinery, equipment, or persons that may have come into physical contact with—
      (i) any kauri tree or alternative PA host plant material; or
      (ii) any soil or other growing medium that has been in physical contact with any kauri tree or alternative PA host plant material.

Over the National Operational Plan term:
The focus for the National Operational Plan term will be ensuring land owners, occupiers and managers know the symptoms of PA-caused disease and where to go to report them.

6.3.2 Roading, tracks and cleaning stations

Our infrastructure in and through kauri forests can either mitigate or contribute to PA spread – depending on how they are constructed and how they are used, the NPMP therefore includes minimum requirements for public road and track construction and for the use of cleaning stations (where present).

Relationship to the National Pest Management Plan

Tracks and roads
A principal measure by which the NPMP's objectives will be achieved is:

improving track user infrastructure, including track upgrades and re-routing to manage and mitigate the spread of PA; and

Rule 10 specifies the minimum requirements for public roads and tracks:

Plan rule 10: open tracks and roads in kauri forest

1) This rule—
   (a) applies to an owner of land in a kauri forest if a track or road passes through that land; but
   (b) does not apply in respect of a track of which the owner is unaware or that is not intended for public use.
(2) The owner must comply with 1 or more of the following requirements:
   (a) ensure all tracks and roads avoid the kauri hygiene zone:
   (b) install 1 or more cleaning stations to remove visible soil and organic matter from risk items:
   (c) install track surfacing to minimise the risk of—
      (i) the spread of soil or organic matter into, within, or from a kauri hygiene zone; and
      (ii) contact with kauri fibrous roots by risk items.
(3) If the owner complies with subclause (2)(b) or (c) the owner must ensure that groundwater and surface water drain away from kauri trees.

Hygiene stations

Rule 9 refers to the use of hygiene stations when entering and exiting kauri forests. To ensure that this rule meets its objectives of mitigating the risk posed by forest visitors, effective cleaning station designs need to be installed and actively maintained.

Over the National Operational Plan term:

There has been research into the effective designs of hygiene stations, tracks and road design. Over the National Operational Plan term, the priorities will be consolidating and publishing guidance and standards where the knowledge exists and identifying gaps for investment, in line with Pou 3 and 4. Additionally, the development of risk maps and assessments to prioritise the placement and upgrades of infrastructure.

6.3.3 Risk management plans

Risk management plans are a key tool for land owners, occupiers and managers to ensure that they have habits and processes instilled that protect the taonga on or near their property. These plans can be adopted voluntarily or can be directed by the management agency or authorised person (as per Rule 3).

Plan rule 4: PA risk management plans

(1) An occupier of land must have, and operate in accordance with, an approved PA risk management plan if a management agency, an inspector, or an authorised person gives the occupier written notice that the land is at risk of PA.

(2) The occupier must submit a PA risk management plan for approval by the management agency, an inspector, or an authorised person within a time that is reasonable and not less than 90 working days after the notice is given.

(3) The objective of a PA risk management plan is to detail how—
   (a) the spread of PA will be controlled, including how it will be contained to exclude it from any kauri forest; or
   (b) the effects of PA will be limited.

(4) A PA risk management plan must contain—
  (a) the objective of the plan; and
  (b) the actions to achieve the objective of the plan; and
  (c) a map of the land identifying any kauri tree locations and other significant features such as roads, other trees, tracks, and cleaning stations; and
  (d) procedures and practices to ensure that the actions in paragraph (b) meet the objective of the plan; and
  (e) procedures for reporting to the management agency, inspector, or authorised person on the implementation of, and compliance with, the plan.

(5) In subclause (1), land **is at risk of PA** if—
  (a) there is a risk of kauri trees on the land being infected by PA; or
  (b) the land—
    (i) has kauri or alternative host material that is infected by PA; or
    (ii) is a pathway from land on which kauri or alternative PA host plant material is infected by PA to other land.

Key factors concerning whether a risk management plan will be requested are:

- PA positive soil samples on or near a property
- Whether the forest is a Kauri Protection Area (see section 7)
- As part of an incursion response
- Application of priority setting criteria (to be developed).

Over the National Operational Plan term:
Over the National Operational Plan term, the policy approach for requesting risk management plans and assessing risk management plans will be developed, with voluntary uptake to be encouraged by land owners, occupiers and managers.

6.3.4 Wild Animal Management

Ungulates (hooved animals) can carry PA across large distances, both within and between kauri forests. As such, a principal measure of success within the NPMP is:

excluding or controlling animal vectors from areas of kauri land

In addition to this, releasing animals into a wild state within or near a kauri forest is prohibited under the NPMP (including but not limited to animals released for hunting) to prevent new or increasing wild animal populations.

Plan rule 7: restriction on release of animals

1) A person must not release an animal into—
  (a) a kauri forest; or
  (b) an area from which the animal could reasonably be expected to enter a kauri forest.
2) This rule does not apply in respect of—
  (a) the movement or grazing of animals on a farm (but this does not affect the application of any stock exclusion notice); or
  (b) animals that are permitted to be released under the Wildlife Act 1953 or any other enactment; or
  (c) animals that are—
    (i) free of visible soil and organic matter prior to entering the kauri forest and upon leaving the forest; and

(ii) under the control of a person while moving through the kauri forest.

Performing wild animal management safely

While wild animal management is an important aspect of reducing PA spread, common methods often include extended periods off-track. It is therefore important that options with less risk of spreading PA are considered first and that thorough hygiene measures are undertaken before entering, and after exiting, where off-track animal management and hygiene within is required (see section 6.1). Canine-assisted vector management is permitted under Rule 7, provided that animals are free of visible soil and organic matter and remain under the control of the handler.

Over the National Operational Plan Term

The focus over the National Operational Plan term is to develop best practice roadmaps, monitoring needs, and increase our understanding of the science and engagement regarding wild animal management, starting with wild pig management. Supporting wild animal management efforts of implementation partners and collaborators.

6.3.5 Land disturbance

On 02 August 2023, Plan rule 5: earthworks PA risk management plan comes into effect – after which most land disturbances/earthworks conducted within a kauri tree hygiene zone will need to be carried out in accordance with an approved earthworks risk management plan.

Where possible, within a kauri hygiene zone should be avoided, however, if works must occur in this zone, that rule will require that these are carried out in accordance with thorough hygiene and risk management procedures, detailed within the earthworks risk management plan. The plan requirements can be detailed below.

1) An earthworks risk management plan must contain—
   (a) the objective of the plan; and
   (b) the actions to achieve the objective of the plan; and
   (c) a map of the land (which may include areas outside the kauri hygiene zone) identifying—
      (i) kauri tree locations; and
      (ii) the boundary of any earthworks; and
      (iii) points from where the earthworks site may be accessed; and
      (iv) signs identifying from where the earthworks site may be accessed; and
      (v) where kauri hygiene protocols are displayed; and
      (vi) where vehicles may be parked (if applicable); and
      (vii) where items contaminated with soil may be washed down; and
   (d) procedures for cleaning all vehicles and equipment to prevent PA entering or leaving the site; and
   (e) procedures for—
      (i) the management of any soil, sludge, or organic material that is retained within a kauri hygiene zone; and
      (ii) transportation of that soil, sludge, or organic material to a landfill approved by the management agency, inspector, or authorised person for that purpose; and
   (f) procedures to limit the risk of water potentially contaminated with PA entering—
      (i) a kauri hygiene zone; or
      (ii) a kauri forest; or
      (iii) a water course connected to a kauri hygiene zone or kauri forest; and

(g) procedures to ensure that all persons entering the earthworks site are provided with a copy of the plan; and
(h) procedures for reporting to the management agency, inspector, or authorised person on the implementation of, and compliance with the plan, which must include—
(i) annual reporting on compliance with the plan; and
(i) immediate reporting when there is significant non-compliance with the plan; and
procedures to ensure that the management agency, inspector, or authorised person is notified of the start and end of each earthworks

Requirements under the Resource Management Act 1991

While Rule 5 is not yet in effect, several district councils have restrictions or requirements relating to earthworks/land disturbances near kauri roots – it is therefore suggesting that individuals ascertain their local consenting requirements or contact councils before they initiate work prior to the rule coming into force. When Rule 5 comes into effect, compliance with a council plan that contains the components listed in 19(6)c of the NPMP will mean compliance with the NPMP. Tiakina Kauri will be working with councils on how to best integrate earthwork risk management requirements and supporting the Department of Conservation in their identification and challenging of gaps relating to Kauri Protection within Resource Management Act planning.

Approved landfills

A list of approved landfills for the disposal of soil, sludge, or organic material will be maintained on the kauri protection website.

Over the National Operational Plan term

Over the National Operational Plan term, the Management Agency will work with regional and district councils to align and integrate earthworks requirements to ensure earthworks-related risks are managed efficiently (without undue double up) and effectively (are understood by those conducting or procuring earthworks). Updated standards for the approval of landfills will also be developed.

6.4 Earthworks and infrastructure companies

Desired outcome: Businesses within kauri lands that regularly move or disturb soil have effective hygiene and risk mitigation procedures in place.

Background

The risk of PA spread is proportional to the amount of soil transported, which makes earthworks a high-risk activity – particularly when the same machinery can be moving between regions and forests. Important measures required to mitigate the risk involved with earthworks near kauri are effective cleaning of footwear, tools, and vehicles between job sites, 'wash down zones' that limit the risk of water spreading PA to kauri trees and careful disposal of organic material collected from kauri forest areas in approved landfills. A best practice guide for operating machinery and vehicles near kauri can be found on the kauri protection website.

Relationship with the National Pest Management Plan

A principal measure of meeting NPMP objectives is:

implementing hygiene standards and programmes, and imposing movement controls on risk items that are, or may be, capable of contributing to the spread of PA; and

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And a measure of NPMP success is:

the level of public and industry engagement in the management of PA:

When Rule 5 comes into effect on 02 August 2023, there will also be a requirement for procured earthworks within a kauri tree hygiene zone to be carried out in accordance with an approved earthworks risk management plan (content requirements are detailed in the 'Land Disturbance' section above).

A person permitted by an occupier to undertake earthworks on land in a kauri hygiene zone must not undertake the earthworks unless— (a) the occupier has provided the person with an earthworks risk management plan approved for that land; and (b) the person operates in accordance with that plan.

Emergency works

Rule 5 does not apply during an emergency, though it is best practice to alert your council or the management agency if any moving of significant amounts of soil or organic material has occurred in or near a kauri forest. Once the emergency is no longer active, subsequent earthworks and land disturbance will require an earthworks risk management plan (e.g. for clean-up efforts).

Over the National Operational Plan term

The focus for the National Operational Plan term will be raising awareness amongst earthworks and infrastructure companies on the commencement of Rule 3 next year – including resources to support hygiene and risk management best practice near kauri.

6.5 Stock owners and grazers

Desired outcome: Stock are not able to enter kauri forests where there is a high risk of spreading PA or where there would be a high impact (ecologically, culturally or economically) if PA was introduced.

Background

Stock animals (e.g. cattle, pigs and sheep) that have access to a kauri forest, risk introducing PA or spreading PA with their movement – reducing forest under-grazing is therefore a high priority risk area for the NPMP. Best practice guides for rural land owners can be found on the kauri protection website.

Relationship to the National Pest Management Plan

A principal measure of the NPMP is:

excluding stock from kauri forests.

To support this, Rule 6 (below) requires stock to be excluded from forests where PA has been detected within a forest and that detection is in proximity (i.e. within 500m) of where stock can enter the forest. Entry into a forest can be through intentional under grazing, a lack of fencing or insufficient fencing to prevent animals from accessing a kauri forest area.

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Plan rule 6: stock exclusion notice

(1) An owner of a grazing animal must ensure that the animal does not enter a kauri forest during a specified exclusion period if a management agency, an inspector, or an authorised person gives the occupier written notice (a **stock exclusion notice**) that PA has been detected—
   a. in the kauri forest; and
   b. within 500 m of an access point to the forest.

(2) A stock exclusion notice must specify—
   a. the kauri forest that grazing animals must not enter; and
   b. the exclusion period.

In other high impact or high-risk scenarios, a Notices of Direction (s122) or Controlled Area Notices (s131) may be issued, as per the powers listed under the "Powers under Part 6 of Act to be used to implement Plan" section of the NPMP (s13). These would include situations where it is a priority to prevent PA introduction (e.g. ecologically rare or culturally significant sites) or where other risk factors exist (e.g. high levels of stock mobility within a forest or between forests).

Notification and responsibility

To create certainty on rule application, the management agency or authorised person will alert land owners when stock must be excluded from a forest on or near their property. The land owner, at that time, may be required to provide information (under Rule 2) by an authorised person or the management agency – the land owner must comply with that request. If the land owner is not the owner of the stock, then they should let the management agency or authorised person know. The stock owner is ultimately responsible for the movement of their animals and compliance with a stock exclusion notice.

Fencing

Installing permanent fencing is a means of becoming compliant with Rule 6, provided the fencing is stock proof and meets council standards and requirements. Support for fencing costs may be available in high priority circumstances, this funding is delivered by regional councils and QEII.

Notice term

Notices issued will include a period of application. These will generally be for the life of the NPMP or for a 10-year period from the issuing date. Notices may be re-issued at the time of expiry.

Over the National Operational Plan term

Over the coming term, processes for prioritising and issuing notices and utilising Part 6 powers will be established. Standards for stock proof fencing, for the purpose of the NPMP, will be investigated.

7. Kauri Protection Areas

Desired outcome: Kauri forest areas of significant cultural and ecological importance are identified in partnership with mana whenua, land owners, land managers and community and are provided with additional layers of protection, where this would benefit the ngahere (forest).

Background

The Kauri Protection Programme has long intended to establish future-focused kauri 'sanctuaries' where concerted and collective effort is applied to ensure specific forest areas are kept healthy and are able to foster long-lived giants for generations to come. Establishing Kauri Protection Areas is a priority for NPMP implementation and the kauri protection programme, as an act of kaitiakitanga, and

highlights the key intention of the programme to centre the protection of kauri when seeking to fulfil the NPMP objectives of reducing the spread and impact of PA.

Criteria for application
The national pest management plan states that a kauri protection area may be established in a kauri forest that meets 1 or more of the following criteria:

- it contains kauri or forests that have significance to Māori and have cultural value in association with historic events, occupation, and cultural activities:
- it contains kauri with important genetic variability:
- the kauri in the area contribute to the diversity, distribution, and abundance of animal and plant species or have other significant ecological value to that area such as being old growth or having the ability to naturally regenerate:
- it contains iconic kauri or stands of kauri; and
- in relation to which the land owner has agreed to a kauri protection status.

Operational policies will be developed collectively to articulate considerations and priorities amongst these criteria.

Relationship to the National Pest Management Plan
The establishment of Kauri protection Areas relates to three principal measures within the NPMP:

- determining and establishing special risk areas and kauri protection areas.
- implementing hygiene standards and programmes, and imposing movement controls on risk items that are, or may be, capable of contributing to the spread of PA.
- managing kauri forest access in collaboration and partnership with mana whenua.

Once areas are determined, the appropriate cultural and regulatory approach will be applied in partnership and collaboration with mana whenua, land owners and councils. Kauri forest owners or managers

Kauri protection areas may involve (but are not limited to the use of):

- Controlled Area Notices
- Rāhui
- Forest closure (by the land owner)
- Other legislative tools (e.g. the Conservation Act 1987).

Over the National Operational Plan term
A kauri protection area working group (including mana whenua, Department of Conservation and regional council members) will be formed to work through the policies and priorities for kauri protection area establishment, aiming to have the first Kauri Protection Areas in place during the National Operational Plan term.

8. Science, research and mātauranga Māori

Desired outcome: NPMP decision-making is knowledge based, with implementation approaches that draw from a comprehensive toolkit of effective, cross-cultural tools, with strategic investments in increasing scientific and operational effectiveness.

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Relationship to the National Pest Management Plan
A number of the NPMPs principal measures to achieve NPMP objectives either refer directly to growing and utilising our PA and kauri knowledge base - or rely on the results of science and research and/or mātauranga Māori to effectively reach their aims. These include:

- applying mātauranga Māori, including cultural harvest, and the results of science and research to the management of PA; and
- carrying out surveillance and monitoring to enable—
  (ii) mapping of the distribution of kauri and kauri forests; and
  (iii) mapping of the presence or absence of PA; and
  (iv) an understanding of the rate of the spread of PA; and
  (v) an understanding of the impacts of PA on kauri and forests; and
  (vi) an understanding of the application and effectiveness of PA control tools, mātauranga Māori, and other management practices to manage the spread of PA; and
  (vii) an understanding of the levels of compliance with the requirements of the Plan; and
- implementing hygiene standards and programmes, and imposing movement controls on risk items that are, or may be, capable of contributing to the spread of PA; and
- applying effective treatments to kauri; and
- k) protecting high-value kauri germplasm and planting kauri that are less susceptible to PA.

Additionally, whether the Plan's objectives are being achieved is to be measured by monitoring and recording the following on a regular basis:

- the management agency's level of understanding of the distribution of PA across kauri lands and kauri forests:
- the management agency's available access to capability, knowledge, and tools to support effective management of PA:

Therefore, building our western and Te Ao Māori knowledge management toolkit – for operational application and strategic decision – is pivotal to NPMP success. Detail on how this will be achieved can be found below.

8.1 Mātauranga Māori

Mātauranga Māori broadly includes traditions, values, concepts, philosophies, world views and understandings derived from uniquely Māori cultural points of view. Important to the way we, in Aotearoa, maintain and restore our environment as it draws upon place-based values and practices distinctive to a Māori worldview. It's about a Māori way of being and engaging in the world – in its simplest form, it uses kawa (cultural practices) and tikanga (cultural principles) to critique, examine, analyse, and understand the world.

Mātauranga Māori is not a single discipline, but knowledge and expertise that sits across multiple areas relevant to NPMP implementation and can therefore be integrated, developed and utilised across all policy areas. This includes (but is not limited to) the use of cultural indicators of forest mauri (health), maramataka (the lunar calendar), rongoā (treatments), rāhui and reo (language carrying history, information and meaning). As mātauranga Māori is inherently place-based, solutions will be developed at a local level and will therefore not be described in detail in this plan.

Over the National Operational Plan term
Over the coming term, mātauranga Māori approaches will continue to be identified and supported.

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8.2 Surveillance, detection and monitoring

Desired outcome: The Management Agency and forest managers develop a spatial understanding of where healthy and at-risk kauri are, the baseline distribution of the PA and PA-caused disease, to enable effective decision-making and on the ground mitigations for preventing further PA spread.

Background
A limited understanding of the distribution and spread of PA exists. To achieve the objectives of the NPMP, research that will facilitate mapping the presence, absence and spread rate of PA is needed, to develop and implement risk based profiling and interventions.

Key objectives of the surveillance programme (2021 – 2025):
1. Define the kauri population distribution spatially using aerial imagery
2. Determine the baseline pathogen distribution
3. Determine baseline disease and pathogen prevalence where possible and appropriate, to help understand changes in disease distribution over time.

Surveillance and monitoring methods
Aerial surveillance can provide kauri tree location data (of particular size classes, depending on the method used to analyse the data) and can indicate stress in the canopy. This can then be paired with ground surveillance (i.e. tree health assessments and soil samples) to determine where the disease and pathogen is.

Tiakina Kauri will prioritise investment in research on this theme that improves our ability to detect the pathogen and disease expression at the landscape scale and to record change over time. This includes but is not limited to:

- soil and root sampling and diagnostic protocols
- use and improvement of monitoring and surveillance technologies (such as remote sensing and artificial intelligence).

Risk Maps
Tiakina Kauri is currently supporting the development of maps displaying a) baseline disease indicators across the kauri population obtained from aerial imagery and b) predicted risk factors associated with disease and pathogen spread obtained from previous research (i.e. Waitakere prevalence study and Ngā Rakau Taketake). These maps can be validated on the ground by trained tree health survey technicians. To determine patterns and processes, a coordinated, broad-scale approach with our partners is necessary across kauri lands.

Over the National Operational Plan term
During the National Operational Plan term, Tiakina Kauri will co-design and begin the implementation of a risk-based surveillance and monitoring workplan in Puketi forest, along with other sites across kauri lands, that can be adapted and adopted by others. A long-term surveillance plan will also be developed, which will transition to an ongoing monitoring plan over the life of the NPMP.

8.3 Research

Several research funding priorities have been identified, within the kauri protection programme's science strategic plan, which support the achievement of the NPMP objectives, these are listed below.

It should be noted, as there are significant gaps in knowledge on PA and its effect on kauri, not all priorities are able to be advanced equally/simultaneously within resourcing limits.

Biology of kauri and PA

Research that increases our understanding of the biotic and abiotic factors that increase pathogen spread and disease incidence/severity is a priority. This will inform where to target different management strategies (i.e., boardwalks, rāhui, kauri Protection Areas, Kauri Hygiene Zones, etc).

Tiakina Kauri encourages research aimed at determining a) the average latency period (i.e., the time it takes a tree to first show visible disease symptoms after infection), b) the factors that influence variation in the latency period, and c) the factors affecting how disease onset and severity may be increased by co-infection with other *Phytophthora* species or reduced by other plants and soil organisms co-occurring with kauri. Projects looking into alternative hosts of PA are currently underway, with results expected within this National Operational Plan period. Seedlings identified to possess traits linked with PA resistance will be planted back into their source populations and monitored for resistance.

Ecosystem impacts and interactions

Long-term ecological monitoring in kauri forests (both healthy and infected) and kauri-specific demography data are needed to enable evaluation of management interventions. Investigations underpinned by mātauranga Māori, and that include cultural health indicators, will be given precedence as these support all four pou.

Building public/community engagement and social licence

It is most important that the public engages with and understands the importance of good hygiene prior to entering and upon exiting kauri forests, the use of management approaches, such as rāhui and disease control techniques, such as phosphite. Tiakina Kauri will prioritise research that informs comprehensive programme decision-making, including providing clear methodologies and protocols for engagement and outreach activities and identifying the key stakeholders and target audiences that are most important to reach (i.e., measured by impact) or most underrepresented.

Control, management and detection

A key outcome is the improvement of strategies to control PA and slow disease expression. A priority is finding long-term, low-impact solutions to controlling the pathogen and disease and the development of effective and cost-efficient PA testing. Initially, Tiakina Kauri is interested in research investigating how to improve the tools we currently have (e.g. phosphite), however, this is will change in future years if the current tools are not able to be optimised.

Te Ao Māori

Tiakina Kauri encourages research that has been developed in place, by Māori and where funding requests come directly from iwi/hapū.

A strong focus is to better understand Māori-led management strategies and solutions (i.e., rāhui, rongoā, harvesting) and how these impacts are measured. Because of the importance and value of cultural harvesting in the ngahere, research that ensures its continuation and sustainability in the face of global threats, such as forest fragmentation and decline, will be prioritised.

Over the National Pest Management Plan

Over the National Operational Plan term, research will be supported in line with the priorities identified above, including the development of cost-effective testing and diagnostic methods. Aspects of current research will endeavour to be operationalised, such as the Ngā Rākau Taketake - Biological

Heritage risk-based profiling approach. Additionally, a cross-agency peer review panel will be established for research that will be used to guide future decision-making.

8.4 Treatments

The NPMP has an aspirational aim of developing tools to reduce PA inoculum and slow disease progression, which requires effective treatments. Fungicides and rongoā Māori treatments are being researched and applied, though further research is required to understand their efficacy, proper dosing rates and any non-target effects.

Phosphite

Phosphorous acid (Phosphite) is a systemic fungicide that can inhibit pathogen growth. Stem injections can supress the onset of lesion development in rickers (with variable results), but care must be taken to apply the proper dose rate to avoid phytotoxicity. Tiakina Kauri has engaged Plant and Food Research to optimise dosing rates on larger trees. Research is required to determine the long-term or non-target effects of phosphite injections on kauri as this is not yet known.

Other fungicides

Fungicides (oxathiapiprolin, ethaboxam, and fluopicolide) have been tested in laboratory trials for their ability to inhibit PA. Oxathiapiprolin had the highest efficacy at inhibiting mycelial growth as well as zoospore and oospore germination though these fungicides have not been tested in a natural environment and are likely to also pose threat to beneficial fungi in the kauri rooting zone.

Over the National Operational Plan term

The goals over the National Operational Plan term are to:

- Continue supporting on-going research and development into improving the treatment tools currently in use
- Deploying treatments currently available, where appropriate, such as in culturally and ecologically significant trees infected with PA
- Supporting the development of new and promising tools for treatment of PA infected trees

9. Communication and Awareness

Desired outcome: The public, businesses and land owners/managers are invested in kauri protection, aware of their obligations under the National Pest Management Plan and how to meet them.

Background

The last national-level campaigns regarding kauri were conducted in 2019, this means that promotion of the national plan requires first re-invigorating the national conversation. Since this time, the programme has moved away from the use of the word dieback, because, to Māori, the word 'dieback' has a negative impact on the wellbeing of kauri and focuses on sickness rather than on keeping kauri healthy. Therefore, a new 'Tiakina Kauri' programme identity has been developed – that acts as a call to action, emphasizing the importance of kauri protection.

As the survival of kauri depends on everyone in Aotearoa taking actions to protect kauri and reduce the spread of the PA pathogen, Tiakina Kauri will initially focus on raising awareness and educating people about the national plan to help people understand and adjust to the new rules and to reinforce good behaviours. This approach aligns with the VADE model of compliance.

Principles

To achieve engagement among the diverse audiences impacted by the introduction of the NPMP, our communications must:

- Achieve thorough reach among target audiences (e.g. nurseries, rural land owners, companies that conduct earthworks)
- Centre kauri protection, with new regulations being a positive step forward for kauri.
- Have an inspiring, engaging and compelling tone.
- Be clear, comprehensive and timely.
- Speak to the specific experiences of audience groups, including the impact of NPMP introduction
- Provide functional 'Calls to Action' for audiences wanting more information.
- Integrate Te Ao Māori into resources and approaches

Objectives
To achieve our desired outcomes, our FY23 communication and engagement activity will be focused on achieving the following objectives:

1) Restarting the national conversation about kauri in a positive way.
2) Increasing understanding of the significance of kauri
3) Raising awareness of the national plan.
4) Encouraging good kauri protection behaviours and compliance with the national plan.
5) Maintaining visibility of the kauri protection programme.

These will be achieved via a number of methods including the use of diverse changes, deliberate branding, clear messaging and targeted public campaigns.

Channels and brand
Digital channels such as the Tiakina Kauri website and social media channels are being reactivated and updated to align with the new programme brand and language, and they will collectively serve as the 'one source of truth' for information about the national plan. Guidelines for physical signage will be gradually updated, with the input of collaborating organisations, to reflect the new programme branding and the NPMP rules, as relevant.

Existing programme collateral will gradually be reviewed and updated, where needed, with collaborating organisations, to align with the national plan. New collateral may also be developed with collaborating organisations or other intermediaries to support the implementation of the NPMP rules.

Te Ao Māori
To reflect the role of mana whenua as co-leaders of the national plan, a Te Ao Māori approach will be considered and incorporated into the content and design of communications and engagement materials.

Education and Awareness activities
In FY23 and FY24 we will raise awareness and visibility of the national plan through:

Awareness campaign to support the implementation of the national plan
The NPMP awareness campaign will be designed to (a) restart a national conversation about kauri protection in a positive way that encourages hope and discourages fatalism, and (b) raise awareness that new national regulations have been introduced to help protect kauri. The awareness campaign will be heavily targeted to audiences living in kauri lands who are likely to be impacted by the NPMP

rules, including rural land owners and farmers, nurseries and forest users, with some national coverage.

Summer campaigns
Summer campaigns will be run during the summer months, during the National Operational Plan term. This is to encourage good kauri protection behaviours, including compliance with rules 8 and 9 (focused on hygiene requirements when entering/exiting kauri forests). The campaigns will target audiences during the period where most outdoor and recreational activity in and around kauri forest areas/trees will occur, and will largely target kauri regions, though it will also include some national coverage.

Targeted communications
While the campaigns will reach most of the audiences affected by the NPMP rules, additional targeted communications will be delivered to businesses and industries affected by the NPMP rules, including native plant nurseries and earthworks and utilities companies, as the implementation processes are finalised.

Supporting activity
The above activities will be supported by our website content, targeted social media activity, proactive PR, branded merchandise and targeted support for intermediaries if/as needed.

Relationship to the National Pest Management Plan
The NPMP states that one of the means of measuring achievement of the Plan's objectives is "the level of public and industry engagement in the management of PA" along with "the level of compliance with the requirements of the Plan". As awareness and understanding are foundational blocks of the Plan, compliance, communication and education will be the primary means of increasing this measure over the coming NOP term.

Over the National Operational Plan term
Over the term, the objective is to generate awareness of the national plan that increases goodwill towards protecting kauri and encourages target audiences' support of, and compliance with, the new regulations.

10. Data and intellectual property

10.1 Information sharing and ownership

Where information is collected by a contracted party, on behalf of the management agency, data sharing agreements will be included in procurement contracts, with the input and permission of land owners and land managers. In working with Māori or on Māori-owned land, a partnership approach will be employed in data-sharing arrangements, ensuring the agreements that are developed have mutual benefit and involve respectful and transparent use of the information collected. These agreements will be developed in open discussion, considering local contexts and values and recognising that open and accessible information best benefits the kauri protection efforts. *"Just as kauri entwine with others to protect the health of the forest, we work together to protect and preserve all kauri lands for future generations."*

Tiakina Kauri are working with Land Information New Zealand (LINZ) to develop 'Kete Aronui' – a secure and collaborative database that will support and steward the information collected as part of NPMP implementation.

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10.2 Personal information

Personal information collection and storage will be in line with the principles of the Privacy Act 2020, including that it is:

- data that is necessary for NPMP implementation
- gathered directly from the individual concerned, where applicable
- collected transparently, with individuals knowing the use of the information
- does not intrude unnecessarily
- secure, with procedures in place to prevent loss, misuse or unauthorised disclosure
- accessible to those that provided it
- accurate and able to be corrected by the individual
- kept only as long as it is necessary
- used for the purpose it was collected for
- not shared with another agency or individual unless in line with its purpose for collection or the information shared is not identifying (e.g. used in statistical analysis)
- not given a unique identifier unless it is necessary

In addition to the Privacy Act 2020, personal information gathered under the Biosecurity Act 1993 must comply with it's requirements, meaning it can only be shared with other agencies in relation to:

(a) the prevention, detection, investigation, prosecution, and punishment of offences or a fine
(b) the protection of the life, health, or safety of a person or group of persons:
(c) the protection of the environment:
(d) the achievement of the purposes of this Act (i.e. PA management).

Additionally, data-sharing agreements will be made with councils and collaborating organisations, should information collected under the Biosecurity Act 1993 be shared, stating the criteria for disclosure of information, how the information may be used and be the extent of which the information may be shared with others (if at all).

11. Performance Measures

Means of measuring achievement of Plan's objectives

1) Whether the Plan's objectives are being achieved is to be measured by monitoring and recording the following on a regular basis:
   (a) the management agency's level of understanding of the distribution of PA across kauri lands and kauri forests:
   (b) the level of resilience of kauri forests in response to PA:
   (c) the level of public and industry engagement in the management of PA:
   (d) the management agency's available access to capability, knowledge, and tools to support effective management of PA:
   (e) the number of physical PA spread mitigations:
   (f) the level of compliance with the requirements of the Plan.

Specific KPIs for policy areas will be developed by 30 June 2023, in collaboration with delivery partners.

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12. Budget

12.1 NPMP Funding

In Budget 2021 the government allocated $32M over a 5-year period to deliver and implement a National Pest Management Plan to manage kauri dieback disease. Remaining funding has been allocated as follows:

2022/2023	2023/2024	2024/2025	2025/2026
$8M	$8M	$4M	$4M

12.2 Tiakina Kauri Management Agency

The costs associated with running the Tiakina Kauri Management Agency are met by BNZ. The baseline for running the agency is currently set at $1.5M per annum.

13. Legal Framework

13.1 National PA Pest Management Plan

The Biosecurity (National PA Pest Management Plan) Order 2022 sets out:

- the management agency responsible for implementing the NPMP.
- objectives of the NPMP, including the adverse effects the NPMP proposes to manage and mitigate and the intermediate outcomes.
- the principal measure to be taken to meet those objectives.
- rules and who needs to meet these, and associated offences.
- powers that either the management agency or an authorised person can use to implement the NPMP.
- the means of measuring the achievement of the NPMP objectives.

Powers under Part 6 of Act to be used to implement Plan
An authorised person appointed under section 103 of the Act for the purposes of the Plan may, in relation to the Plan, exercise all or any of the powers conferred on that person and specified in subclause (2).
The powers are—

- the power to require assistance (*see* section 106 of the Act):
- the power of inspection (*see* sections 109 and 112 of the Act):
- the power of entry in respect of offences (*see* sections 111 and 112 of the Act):
- the power to record information (*see* section 113 of the Act):
- the general powers (*see* section 114 of the Act):
- the power to apply articles or substances from an aircraft (*see* section 114A(3) of the Act):
- the power to use dogs and devices (*see* section 115 of the Act):
- the power to seize evidence (*see* section 118 of the Act):
- the power to seize abandoned goods (*see* section 119 of the Act):
- the power to intercept risk goods (*see* section 120 of the Act):
- the power to examine organisms (*see* section 121 of the Act):
- the power to apply articles or substances to places (*see* section 121A of the Act):
- the power to give directions (*see* section 122 of the Act):

- the power to vaccinate, etc (*see* section 123 of the Act):
- the power to declare a place to be a restricted place (*see* section 130 of the Act):
- the power to permit movement of any organism, organic material, risk goods, or other goods, in contravention of a notice under section 131(3) of the Act (*see* section 134(1)(b) of the Act).

The management agency may, in relation to the Plan, exercise all or any of the powers conferred on it and specified in subclause (4).

- The powers are—
- the power to act on default (*see* section 128 of the Act):
- the power to declare any specified area to be a controlled area (*see* section 131 of the Act):
- the power to recover costs (*see* section 135 of the Act):
- the power to waive all or any part of a debt (*see* section 136 of the Act).

Penalties and offences

A person who fails to comply with a Plan rule commits an offence (*see* section 154N(18) of the Act). Plan rules 1 to 10 relate to—

- reporting kauri that exhibit symptoms of PA (Plan rule 1):
- providing information to the management agency, an inspector, or an authorised person (Plan rule 2):
- having, and operating in accordance with, a production plan if kauri are moved (Plan rule 3):
- having, and operating in accordance with, a PA risk management plan if given notice that land is at risk of PA (Plan rule 4):
- having, and operating in accordance with, an earthworks PA risk management plan if undertaking earthworks in a kauri hygiene zone (Plan rule 5):
- stock exclusion notices (Plan rule 6):
- restrictions on the release of animals into or in the vicinity of a kauri forest (Plan rule 7):
- cleaning items prior to entry into and exit from kauri forests (Plan rule 8):
- the use of cleaning stations on tracks and roads in kauri forests (Plan rule 9):
- requirements for tracks and roads in kauri forests (Plan rule 10).

Each of the rules is a prosecutable offence under section 154N(18) of the Biosecurity Act 1993, with the potential to result in a criminal conviction and/or a maximum penalty fine of $5,000 for an individual and $15,000 for a body corporate.

Infringement offences

The Biosecurity (Infringement Offences) Regulations 2010 have been amended, making the breach of Plan rule 8 or 9 an infringement offence under the Act. The infringement fee for failing to comply with Plan rule 8 is $300. The infringement fee for failing to comply with Plan rule 9 is $400.

13.2 Unwanted Organism status

Phytophthora agathidicida is an unwanted organism under the Biosecurity Act 1993. Under Section 52 and 53 of the Biosecurity Act 1993, it's an offence to communicate, propagate or sell or release these organisms, unless permission has been granted by a Chief Technical Officer. For example, permission from a Chief Technical Officer is needed to transport material known to contain PA. If you notice a kauri you believe to be sick, contact your local regional council or MPI. If you have a positive PA test, you may not knowingly move the organism. If you need to transport contaminated material off your site, permission must be granted by MPI; the permission form can be found on the MPI website.