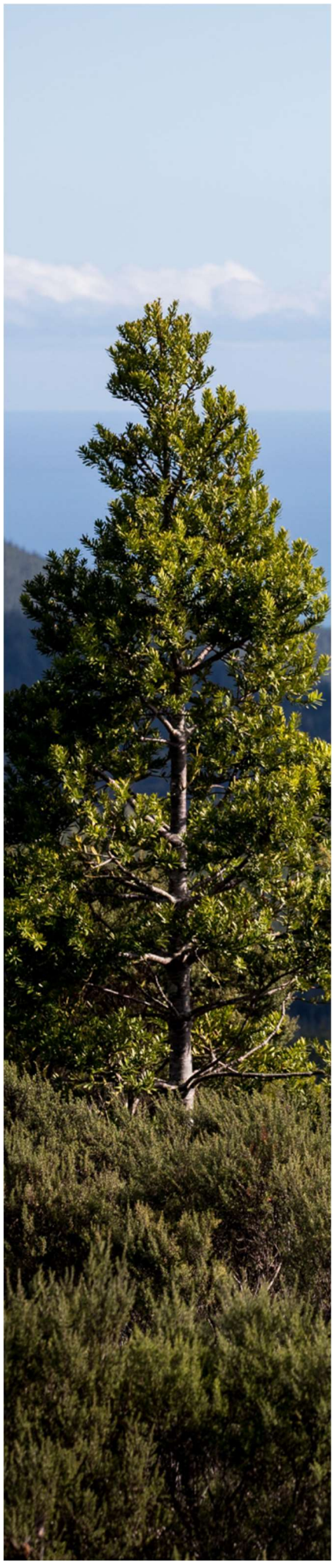

Ministry for Primary Industries
Manatū Ahu Matua

National PA (*Phytophthora agathidicida*) Pest Management Plan

National Operational Plan

2024 – 2032

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 *Phytophthora agathidicida* (PA) Pest Management Plan (NPMP) in a manner that meets 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 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 2024 – 2032, to be reviewed and updated (as needed) yearly. The Operational Plan sets out the approach to implementation, policies, priorities and budget to deliver under the NPMP. Policies are current as of the most recent yearly review, with updates being held on the Kauri Protection website.

2. Introduction

The National PA Pest Management Plan came into effect on 2 August 2022, setting six objectives. These are to:

(a) reduce the spread of PA;
(b) maintain areas free of PA;
(c) reduce the impact of PA within infected sites;
(d) locally eliminate PA within infected sites;
(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).

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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;
(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;
(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 above. Successful implementation requires that management approaches do not lead to or exacerbate these adverse effects.

As PA cannot currently be removed from areas in which it has established, the intermediate outcomes that the plan intends to achieve in the first 10 years are:

(a) sustained control of PA to reduce its impacts on infected kauri and its spread to other kauri in New Zealand;
(b) exclusion of PA that is present in New Zealand from areas where PA is not yet established; and
(c) containment within, or reduction of the geographic spread of PA from, an area over time.

As detailed in the National Policy Direction for Pest Management, "sustained control" programmes are those that provide ongoing control of the subject (in this case PA) to reduce its impacts on values and its spread to other properties. "Exclusion" programmes are those that prevent the establishment of the subject (PA), which is present in New Zealand but not yet established in an area. "Containment" programmes are those that seek to contain or reduce the geographic distribution of the subject to an area over time.

The Tiakina Kauri management agency

The Tiakina Kauri Management Agency is nested within Biosecurity New Zealand and has responsibility for the implementation of the National PA Pest Management Plan. The name Tiakina Kauri represents the concept of two Kaupapa (concepts) – acknowledging both the physical and spiritual aspects of working with Kauri and the wider ngahere (forest). This is *an example of Nuka Reo.*[1]

[1] Nuka Reo is a literary device; a strategy and feature of language that is used by a speaker or composer to convey and embellish ideas and infuse them with a desired feeling. Examples of literary devices include metaphors, idiomatic expressions and rhyme.

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Tiakina – is a call to action to guard, look after, care, protect and serve. Tiakina represents the physical action we must all take to care for and protect Kauri.

Kauri – represents the mauri (life-force) and majesty of Kauri; the spiritual experience and what can be seen, heard and felt in the presence of these ancient and sacred trees.

Tiakina Kauri is phasing out the use of the word 'dieback' as part of a commitment to tangata whenua to shift the programme's focus from Kauri sickness to Kauri 'ora' (health), to reflect a more holistic approach to Kauri health and well being.

The structure of the NPMP and the National Operational Plan

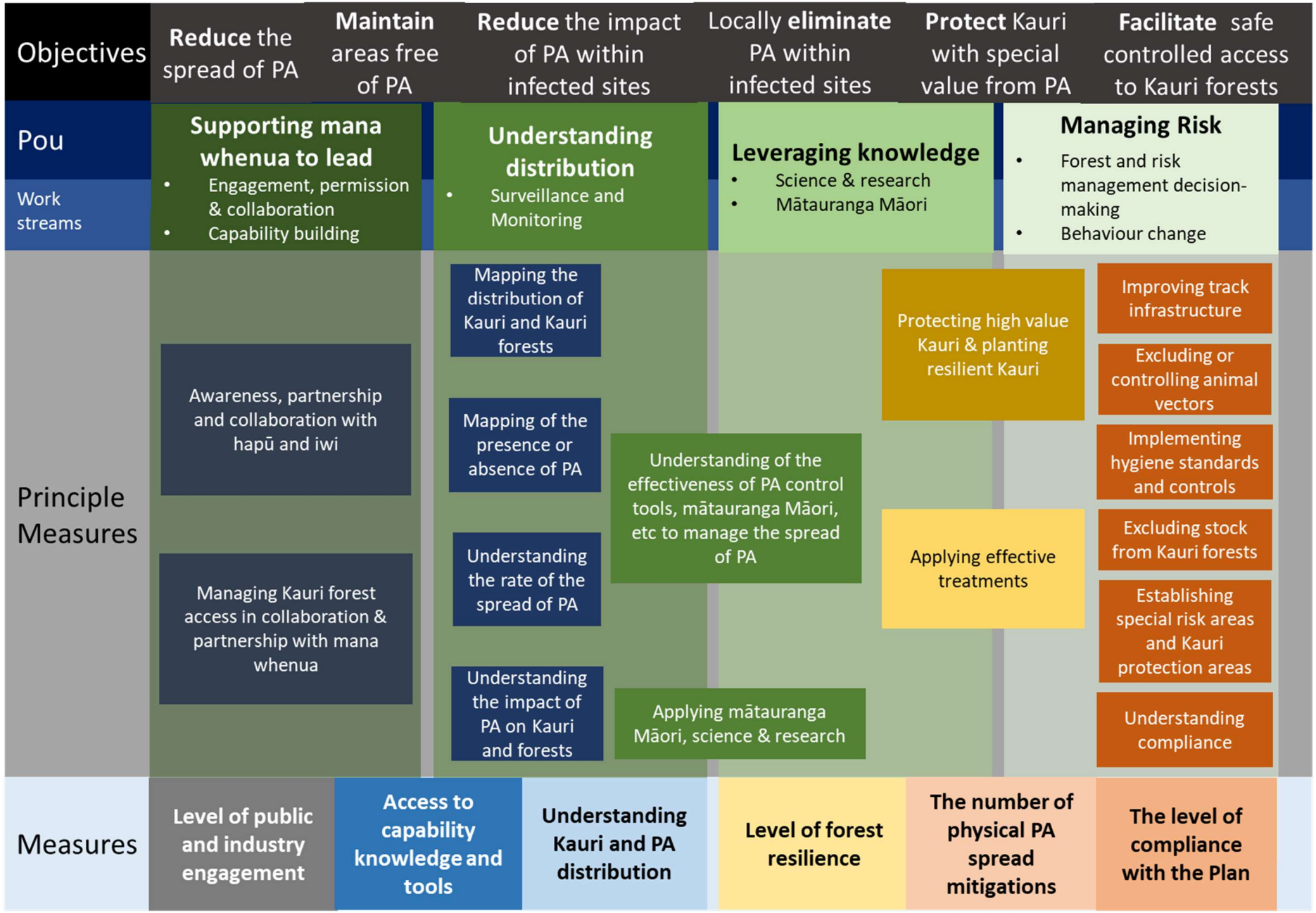
Diagram 1 below provides detail on the relationship between NPMP components and how this relates to funding and workstream priorities laid out in this document. Each principal measure is referenced in the applicable policy area within this document, along with the relevant rules for that policy area.

This National Operational Plan aims to support alignment of management actions and priorities across these workstreams and policy areas, across the range of delivery organisations, operating in a number of overlapping regulatory environments (an overview of the Kauri Protection regulatory environment can be found here: https://www.kauriprotection.co.nz/tiakina-kauri/corporate-documents/).

This National Operational Plan details the operational objectives over the next 2-7 years, the contributors to achieving these objectives and the actions and policies required in order to succeed.

Agencies bring their own resources to achieving the detailed Kauri protection outcomes and NPMP objectives, as well as the funds distributed by Tiakina Kauri and the Māori-Crown governance mechanism to provide oversight of all work within the Kauri protection programme.

Diagram 1: The components of the National PA Pest Management Plan



2.1 Background

Kauri in New Zealand

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 of the North Island are regenerating and Kauri grows naturally above a latitude of 38 degrees south (a virtual line approximately Kawhia to Tauranga).

Kauri are 'Rākau Rangatira' (chiefly trees) and are important to all New Zealanders. They have special significance to Māori as a "a taonga tuku iho of the ancestral spiritual world of the Supreme Being, Io Matua Kore, followed through aeons to Ranginui and Papatūānuku, Father Sky and Mother Earth, and their child Tāne [Mahuta]"[2]. 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.

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 that 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.

Transmission, detection and impact of PA

PA is spread through soil movements – 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, but 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.

There is no known cure for the pathogen, and limited treatment options, meaning the long-term survival of Kauri ecosystems is dependent upon the prevention of PA spread to forests that are not currently contaminated and the containment of already infected areas to protect surrounding areas and values. Actions to date have been designed to reduce the movement of the soil that may contain the pathogen (such as track improvements, animal control, behaviour change programmes), manage the disease (including phosphite treatments) and invest in operational research. Prioritisation of vector management approaches is constrained by a limited understanding of the host population, pathogen and disease distribution. Due to this, surveillance and baseline monitoring has been, and continues to be, a priority for the programme.

[2] From the writings of Dr Mānuka Henare (Te Rarawa, Te Aupōuri, Ngāti Kahu). Refer also to https://www.Kauriprotection.co.nz/about-Kauri/Kauri-te-ao-maori/

3. Implementation approach and guidance

3.1 Geographic application

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 tenures.

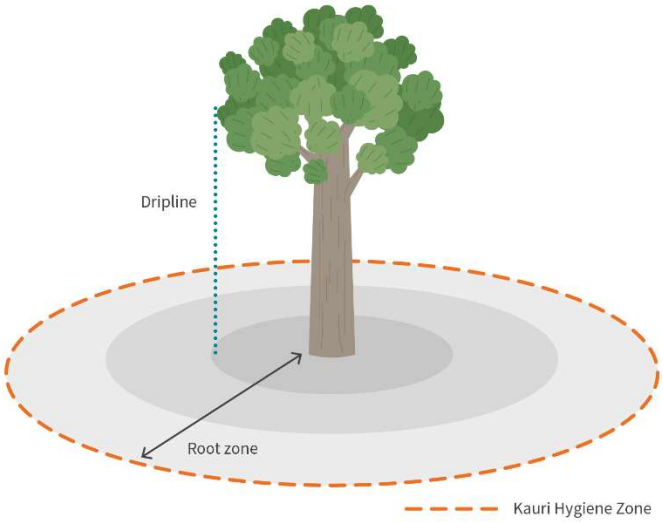
Kauri lands means within the boundaries of Northland Regional Council, Auckland Council, Waikato Regional Council and Bay of Plenty Regional Council.

This is because Kauri naturally grow in northern Aotearoa New Zealand – from the tip of the North Island to the 38th parallel that goes from Kawhia to northern Tauranga, encompassing Te Tai Tokerau, Tamaki Makaurau, Pare Hauraki, Waikato-Tainui and Tauranga Moana. A map showing this range can be found in Figure 2.

When the National Pest Management Plan 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.

Each Kauri tree has a **Kauri hygiene zone,** which means 3 times the maximum radius of the canopy dripline of a Kauri tree (as demonstrated in Figure 1 below), which is relevant to the application of, and compliance with, a number of Plan rules.

Figure 1: the Kauri hygiene zone of a Kauri tree

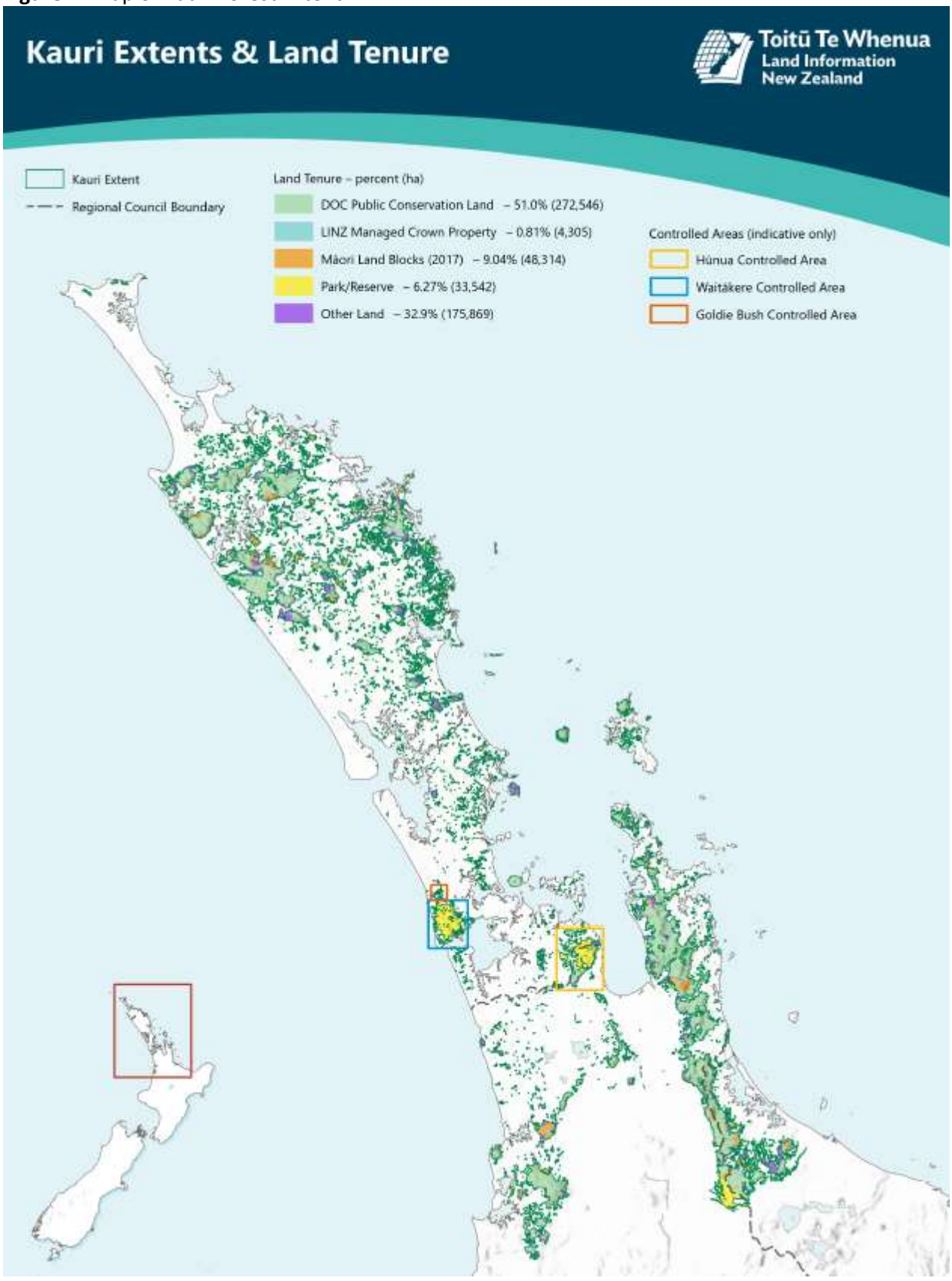


When the NPMP refers to a **Kauri forest**, it means a forest or bushland ecosystem, within Kauri lands, that contains:

- 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.

Within the applicable forests, the policy approach to implementation will be to focus on those forests with Kauri stands (groups of Kauri trees), rather than targeting incidental emergence of Kauri. Kauri stands, throughout Kauri lands, are mapped (where trees are taller than 10m) in Figure 2 below.

Figure 2: Map of Kauri Forest Extent



Regional Pest Management Plans
In addition to the National PA Pest Management, each region has a Regional Pest Management Plan, developed by the Regional or Unitary Council. PA is listed as a pest in multiple Regional Pest Management Plans – and in some cases there are accompanying rules within these Plans that must be complied with within that region. Both Regional Pest Management Plan and National Pest Management Plan rules apply in these circumstances. If compliance with both is not possible, then the National Pest Management Plan takes precedence.

Controlled Areas
The Biosecurity Act 1993 allows for "Controlled Areas" to be declared for the purpose of managing a pest or unwanted organism. There are three Controlled Areas currently in place, for the purpose of preventing the spread of PA, within the Hūnua Ranges, the Waitākere Ranges and Goldie Bush (indicated in Figure 2). The Controlled Area Notices for these forests include restrictions on the movement of organic matter and requirements to undertake certain cleaning procedures when entering and exiting the area. Full Controlled Area requirements and detailed maps of each Controlled Areas extent, can be found here: Protecting kauri: Controlled Areas in Auckland.

3.2 Implementation principles

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.

NPMP implementation principles:

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 Our values

Kaitiakitanga | Guardianship, protection

- We are collectively responsible for protecting and enhancing our taiao – environment. Kaitiaki is the Māori term for the concept of guardianship and protection of the sky, the sea and the land. A kaitiaki tāngata is a human guardian.
- The kawa – cultural principles and tikanga – traditional practices of protecting and looking after the environment are referred to as kaitiakitanga – a way of ensuring the mauri (life force) of the environment is maintained and in balance.
    - ***Whatungarongaro te tangata toitū te whenua***
    - *As man disappears from sight, the land remains*

Mahi Tahi | Working together, collaboration

- It is important that we work collaboratively at all levels to protect Kauri across ngā whenua Kauri – Kauri lands. We will communicate with, and support our partners, stakeholders, and wider Kauri ora community.
    - ***Mā tini, mā mano, ka rapa te whai***
    - *By many, by thousands, the object will be obtained. By joining together, we will succeed; a great number will achieve what a few cannot.*

3.4 Funding and workstream priorities

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, and in collaboration with regional councils and the Department of Conservation.

NPMP success requires local knowledge and connections to the people and the land, as well as specialised skillsets - in the sciences, surveillance and Mātauranga Māori. The NPMP 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 (priorities)

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 in both knowledge and delivery".*
4. On the ground Kauri Protection works, including awareness, education and infrastructure that prevents the spread of the PA pathogen.

To support delivery in each of these areas, and to foster alignment with operational partners, workstreams within each Pou have been developed, these are detailed in the "workstream" column of Table 1.

Over the previous National Operational Plan term, the priorities were to:

- establish a local Kauri Ora workforce (Pou 1)
- build a picture of the location of Kauri, develop tools and protocols for effective PA sampling and detection and develop a national surveillance strategy (Pou 2 & 3)
- restart the national conversation about Kauri protection, to support NPMP compliance (Pou 4).

For the next two financial years - FY24/25 and FY25/26 – the top priority will be on supporting behaviour change through targeted education and compliance efforts, supported by strong resources and standards (Pou 4), capitalising on the surveillance workforce and tools developed over the last NOP term (Pou 2) and on developing a collective "Kauri Ora" work plan across partners and collaborators, with clear roles and responsibilities and strong supporting tools (such as Kete Aronui).

A more detailed description of current priorities, by Pou and workstream, can be found in Table 1.

Table 1: Priorities for financial year 24/25 and 25/26

Pou	Workstream	Priorities over the next two financial years
Pou 1	Engagement, permission and Collaboration	• Supporting the establishment and success of mana whenua collaborations around Kauri – forest-based, regional and organisational • Developing a Mahi Tahi Strategy - a collective engagement and partnership plan, with mana whenua, councils and agencies.
	Capability Building	• Succession strategy developed, including a stocktake of existing programmes and resources • Develop and implement a training and career pathways programme, that supports mana whenua to lead operational and specialised roles in the Kauri Protection Programme.

Pou	Workstream	Priorities over the next two financial years
Pou 2	Monitoring & surveillance	• Formalise and standardise training protocols for surveillance field work, nationally • Surveillance and monitoring programmes are being run by trained groups • Priority forests have strategic surveillance plans that build a local and national picture and incorporate existing knowledge • Improving the speed and confidence of sampling and diagnostic testing used in the field and in the laboratory.
Pou 3	Mātauranga Māori	• Continued support for regional delivery of Mātauranga Māori leadership, guidance and support • Support for Mātauranga Māori to be incorporated into Kauri Ora Plans.
	Science & research	• Collective engagement plan and investment plan developed, adjusted to lowered funding levels.
Pou 4	Forest and Risk Management decision making	• Kauri ora plan and risk maps embedded as a planning and prioritisation tool – with supporting guidance and documentation published • Priority projects progressed for FY 24/25, in line with decision-making criteria • Stocktake of current Kauri Ora action across forests, to identify gaps and prioritise actions going forward • Operational Advisory group established. • Programme standards are progressed in line with needs that are identified, and prioritised via the Operational Advisory Group.
	Behaviour Change	• Maintaining public visibility of Kauri protection • Targeting high-risk audiences to increase awareness and understanding of the national plan rules • Providing resources and training to support programme stakeholders in engaging with high-risk audiences about the national plan • Agreeing roles and responsibilities for across organisations, regions and land tenures • Finalise the National Compliance Plan • Rolling out authorised persons training to partners and collaborators • Establishing and implementing an accreditation programme for working around Kauri. • Undertaking a stocktake and update of website resources. • Developing a landfill and disposal policy and programme standard.
All Pou	Strategy, governance and reporting	• Refreshing the Governance Group Terms of Reference and ways of working • Reporting progress to Governance three times a year • Reporting to Minister and public yearly • Holding an annual regional hui report-back, on the Kauri Protection activities of partners and collaborators.
	Data Management and Sharing	• Establishing Kete Aronui as a comprehensive tool, that provides insights that aid operations and enables efficient information sharing, in line with agreed data sharing arrangements.

Mid-term objectives
Once we have distilled and codified the learnings and tactics developed over the initial NOP term into the programme resources detailed above, these tools will enable efficient and long-term deloyment of the Kauri Ora workforce capacity that has been built. Substantial benefit will be realised in the implementation of the strategies, plans and standards by mid NOP term (FY26/27 - FY28/29).

Once the Succession Strategy and the Training and Career Pathways Programme have been developed, mana whenua will either lead the implementation of these programmes or be training to take over leadership. A continued area of training and development will be in surveillance and monitoring – with mana whenua (in addition to carrying out ground surveillance) independently developing surveillance objectives and sampling plans, contributing to the development of comprehensive GIS systems and fully utilising enhanced risk maps. Through the implementation of ground-breaking research, there is potential for mana whenua to operate local diagnostic laboratories within Kauri lands – increasing the speed of receiving results, gathering much greater information on presence of the pathogen and lowering the cost associated surveillance activities.

With the development of programme standards over the initial 2 financial years, the next focus will be on embedding these standards to achieve long term behaviour change – seen via widespread NPMP compliance and uptake in best practice. This will be achieved via the design and development of activity-based accreditation programmes, collaborating with agencies, Māori, research providers – amongst others. The first of these will be developed in the FY24/25 and FY25/26 NOP term – learning lessons from the Western Australian Green Card[3] model and focusing on general hygiene requirements for off track Kauri forest activities. Further accreditation will look at building Kauri Protection actions into organisational policies and protocols – targeting key businesses and activity groups. Accreditation will play a role in the National Compliance Plan, where motivation or incentive for compliance exists. The completed National Compliance Plan will also provide for enforcement activity to be carried out across Kauri lands, with the trained and authorised workforce.

Mid-term, the roles and responsibilities within the Kauri Ora programme will be well understood and leveraged as the Mahi Tahi strategy moves from development to implementation, consolidating a shared vision that places Kauri at the centre. Operational and strategic decisions will be supported by active Kauri Ora plans, regional networks, the operational advisory group and an active and well supported Governance Group. An update to the Science Plan will be carried out at mid term, and two pilot Kauri Protection Areas will also be established, with support from mana whenua, land owners, land managers and the community.

To note, however, the ability to implement these objectives, and ultimately achieve the 7-year outcomes (articulated in workstream sections 4-7), is dependent on future resourcing decisions.

3.5 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.

Te Whānau Whānui o te Kauri
Below (Table 2) is a summary of actions that may be undertaken by Kauri protection collaborators and partners, known as “te whānau whānui o te Kauri”, towards the NPMP objectives. As described in the

[3] https://www.dwg.org.au/green-card-training/#:~:text=DWG%20Green%20Card%20Trainees%20who,through%20their%20in%2Dfield%20activities.

priorities for FY24/25 and FY25/26, roles and responsibilities will be agreed for a number of the newly established workstreams as an early activity in this coming National Operational Plan term.

Table 2: Actions that may be taken by Te Whānau Whānui o te Kauri

Group	Actions that **may** be taken to implement the NPMP	
Department of Conservation	• Actively using regulatory tools under Conservation legislation to effectively manage the risk of Kauri disease on public conservation lands, including forest and track closures. • Advocating, promoting and educating in relation to Kauri disease consistent with the Department of Conservation's functions under section 6 of the Conservation Act 1977.	• Involvement in regional coordination, regional compliance and regional implementation. • Ensuring that all staff and contractors implement effective PA hygiene protocols and comply with requirements of the NPMP. • Actively manage PA on lands managed by organisation.
Regional Councils	• Including appropriate rules and other requirements in regulatory plans administered by council and implementing these, including ensuring consent conditions provide for the effective protection of Kauri from Pa and associated compliance monitoring and reporting. • Contributing towards the costs of implementing the plan.	
Hapū and iwi	• Preparing a funding plan for activities identified in the regional implementation plans, including capacity and capability building. • Actively managing Kauri disease on publicly owned lands in accordance with the NPMP, where co-management agreements exist with the statutory land manager and general land, by agreement. • Using and applying solutions sourced from Mātauranga Māori for the protection of Kauri from PA. • Carrying out compliance monitoring and reporting appropriated to the effective protection of Kauri from PA. • Self-nominating any other action appropriate to the effective protection of Kauri from PA as and when they feel ready.	
Territorial authorities	• Minimising the risk of Kauri disease spread by regulating earthworks under the Resource Management Act 1991 - this activity is to be funded by the local authority. • Contributing towards the costs of implementing the plan.	

Governance and advisory

Given the number of parties with responsibilities for Kauri Ora, a number of mechanisms have been established to foster alignment, collaboration and to ensure adequate oversight. These are detailed in Table 3.

Tiakina Kauri Governance group

The Tiakina Kauri Governance Group provides strategic oversight to the Kauri protection programme, which includes the implementation of the NPMP and national Kauri protection strategy. The 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 government official. This provides for both a Te Ao Māori and a Crown perspective at the highest level, which will benefit the Tiakina Kauri management agency and the programme to deliver the Operational Plan as Treaty partners.

Table 3: oversight and advisory groups

Grouping	Who	Roles
Tiakina Kauri Governance Group	Mana whenua, Crown, science and community representation.	• 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.
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. • Build collaborative effort, problem solve and leverage organisational capability and capacity.
Technical advisory Groups (set up as needed)	Experts with knowledge sets specific to the advisory area.	• Provide advice, protocols and papers on topics that require technical expertise.

4. Pou 1 - Building capability and capacity of mana whenua to lead Kauri protection locally

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.

The programme has a particular focus on supporting mana whenua to play a leadership role in Kauri protection within their own rohe, by supporting Kauri Ora planning, networking and training, as well as investing in the materials, tools and equipment needed to have a strategic and operational workforce.

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
- Permission, partnership, participation, protection
- Kaitiakitanga
- Mahi tahi
- Fostering 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.

Principal measures (listed in Clause 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;
- 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.

4.1 Engagement, permission and collaboration

Desired outcome: Mana whenua throughout Kauri lands are engaged in, and participate in, all levels of Kauri protection and NPMP implementation – with a sustained work force, partnerships and networks.

Process of engagement
Delivery of the objectives of the NPMP is, 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 requires extensive engagement with mana whenua.

As part of Tiakina Kauri's Māori engagement strategy, regional relationship managers organised and implemented a series of regional hui hononga with mana whenua across all Kauri land (hononga meaning connection, relationship, or bond.) The meaning and expression met the intended kaupapa (purpose), to share the programme more widely, introduce Tiakina Kauri staff and stakeholders and engage directly with mana whenua located at place. Pre-hui meetings were held with programme stakeholders, in particular local Department of Conservation and regional council representatives, who ensured visibility and presence at all events, supporting a joined-up approach. Regional team members led hui hononga in the iwi rohe of Tauranga Moana, Pare Hauraki, Te Tai Tokerau, Waikato-Tainui and Tamaki Makaurau.

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; and
- providing options in meeting the NPMP objectives.

Supporting networks and collaborations
Establishing and supporting multi-level networks and collaborations is a Tiakina Kauri objective. Facilitating organised events in different venues (community meeting spaces, marae, forests and offices) both face to face and on-line.

Formal collaborations – such as the Iwi CoLab in Te Tai Tokerau, where Te Roroa, Te Rarawa, Ngāti Kurī and Ngātiwai – formed a governance and planning structure around a Kauri Ora work Programme, performing operational and strategic Kauri Protection work such as surveillance, outreach, track maintenance and compliance.

Other collaborations are project based – like the Auckland Council, Department of Conservation, Ngāi Tai ki Tāmaki, Ngāti Tamaoho, Ngāti Te Ata, Ngaati Whanaunga, Ngāti Paoa and Ngāti Tamaterā bike ambassador programme run for Te Ngāherehere o Kohukohunui / Hūnua.

Another is the collection of te whānau whānui o te Kauri to meet to share knowledge or build programme tools – such as the two-day noho marae to co-design the Kauri Ora Plan template (see the Forest and Risk Management Decision-Making section).

Kauri protection mana whenua groups located on the eastern coast of Te Tai Tokerau have formed a collective providing a joined-up work plan.

Regional hui have been organised and facilitated with fund recipient groups based in Te Tai Tokerau and Southern Kauri lands. Both regions have supported the continuation of these events at least annually.

These gatherings provide a platform to share learnings, make connections and foster accountability to the Kauri Ora community locally and regionally.

Mahi Tahi Strategy
As a programme value, Mahi Tahi is about working together and collaboration. There are a range of collaborations, connections and overlaps between relationships and responsibilities across Kauri lands – including the requirement for local and central government agencies to consult or partner with Māori, across multiple pieces of legislation, regulation, settlements and policies.

To work together to be effective yet efficient –a collective Mahi Tahi strategy will be designed with partners and collaborators.

Outcomes sought over the 7-year National Operational Plan term:

- Regional networks, events and collaborations are established and self-sustaining sharing resources, learnings and operational capacity between Māori, government agencies, councils and community.
- Māori engagement is actively maintained throughout Kauri lands.

4.2 Capability Building

Desired outcome: Mana whenua fulfil operational, strategic, technical and specialised roles in the NPMP implementation – providing local leadership.

Seed funding
A priority for Tiakina Kauri over the last National Operational Plan term was to support mana whenua organisations to establish Kauri Ora work programmes. This was done primarily through seed funding grants, which provided groups $15K – $80K to undergo detailed planning work and to obtain the necessary equipment and training to undertake work safely. This programme has resulted in a number of well-scoped work plans that proceeded for full funding or that became self-sufficient as a result of the initial investment.

Training and Career Pathways
A key work programme rolled out over the initial National Operational Plan term was to deliver surveillance training to mana whenua groups, so they may undertake surveillance and monitoring within their rohe. This programme successfully trained over 20 people, across 10 organisations, to undertake soil sampling and tree health assessments. Moving forward, training, accreditation and authorisation programmes will be developed for additional NPMP roles and functions and delivered to mana whenua as appropriate and in line with local aspirations as part of the development of a Training and Career Pathways work programme.

Succession Strategy
As the Kauri ora community develops, there is also a need to progress strategies that support sustainability, retaining organisational and protection programme experience and skills in Kauri lands. This will create inter-generational transmission opportunities to share knowledge with the next wave of Kauri guardians. A succession strategy will be co-designed and implemented over the National Operational Plan – starting first with a stocktake of the resources and programmes in existence across Kauri lands.

Outcomes sought over the 7-year National Operational Plan term:

- Networks, training programmes and resources are in place to support mana whenua groups to perform NPMP functions and kaitiaki roles for Kauri in their rohe.

5. Pou 2 - Surveillance and monitoring

Desired outcome: The Management Agency, mana whenua 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

Tiakina Kauri has engaged with researchers to develop methods, models and protocols to achieve the programme's surveillance objectives. Methods have been developed to map historic and contemporary risks of PA spread over the Kauri population, which can be used to inform sampling plans for ground surveillance activities (soil sampling and tree health surveys) as well as risk management plans.

These methods are informed by models built to create sample size calculations for different sized areas of interest for surveillance. Different methods can be used depending on the surveillance objectives, budget and spatial scale requiring surveillance. Methods are continually being optimised and improved as new knowledge, technical advances and information emerges. Ultimately land managers and mana whenua will be able to obtain the answers to their own research questions at place, in addition to contributing to the national picture of Kauri health, through the use of tailored risk maps and sampling plans.

Tiakina Kauri's Surveillance Strategy can be found at: www.kauriprotection.co.nz/tiakina-kauri/corporate-documents.

Risk Maps

Tiakina Kauri is currently supporting the optimisation of methods to map decline in the canopy (a baseline disease indicator) across the Kauri population obtained from aerial imagery and predicted risk factors associated with disease, and pathogen spread obtained from previous research (such as the Waitākere and Hūnua prevalence studies and Ngā Rakau Taketake's Integrated Surveillance Theme). These maps can be used as a standalone tool for managers to improve their understanding of risk across the forest, and risks can be validated on the ground by trained tree health survey technicians. Risk maps have been deployed across seven significant forest areas with a limited number of risk factors. Improvements to these maps will be ongoing, as the numbers of risk factors and their relative importance are updated and incorporated. To determine patterns and processes, a coordinated, broad-scale approach with our partners is necessary across Kauri lands.

Pathogen freedom sampling

Ground surveillance has commenced across several major forests, with the aim of proving pathogen freedom. Optimisations have been made to the methods underpinning sampling plans, which include a stronger understanding of risk probability, resulting in a reduction in the number of samples required to reach the goal of proving pathogen freedom. Ngā Rakau Taketake, Auckland Council, mana whenua and Tiakina Kauri have contributed to the development of risk maps and surveillance methods, which can be targeted at discrete, high-risk areas or at the forest scale to achieve 95% confidence of pathogen freedom.

Stand level maps

Kauri mapping, at the individual tree-level in key forests, has also occurred across the distribution range to the stand level (>10 ha). When combined with risk maps, this tool can help managers to identify the Kauri stands at the highest risk of pathogen spread and prioritise their planning. Stand level maps will be available to landowners, businesses, agencies and the public to assist with conducting and planning activities safely around Kauri. Refer to the Kauri Protection website or reach out to Kauri.protection@mpi.govt.nz for access to the most up to date information.

Diagnostic methods and laboratory accreditation

There are currently two diagnostic tests performed by four labs that are used to detect PA in soil samples. Results have historically been inconsistent between tests and among providers. To improve testing regimes and increase consistency across tests and labs, Tiakina Kauri gathered experts together to optimise test protocols and perform assessments of the different labs to verify their capacity and capability to deliver test results for the programme. All labs have agreed to use the optimised test protocols, available at www.kauriprotection.co.nz/resources/standard-operating-procedures/. Representatives from MPI's Plant Health and Environment Laboratory and Tiakina Kauri have completed visits to the four labs and have delivered recommendations to improve their workflows and have accredited the labs to perform diagnostic testing.

Validation and communication of a positive result

To accommodate for the potential for a false positives and false negatives within diagnostic results, a validation process has been developed (Table 4) that balances efficiency of processes (i.e. limits unnecessary effort) against the impact and likelihood of an incorrect result.

Table 4: Validation process for PA diagnostic results

		Morphological test			
		Present		**Not detected**	
		PA has been detected nearby previously	**PA has never been detected in the area before**	**PA has been detected nearby previously**	**PA has never been detected in the area before**
DNA-based LAMP test	**Detected**	Confirmed detection	Positive screening test. New sample validation required.	Confirmed detection	Positive screening test. Validation required.
	Questionable	Confirmed detection	Positive screening test. New sample validation required.	Suspect screening test. Validation required.	Suspect screening test. Validation required.
	Not detected	Confirmed detection	Positive screening test. New sample validation required.	Not detected	Not detected

Where a test returns a positive result in an area where PA has been detected nearby previously, it is more likely that this positive result is correct, reducing the need for further validation in order to classify the result as a confirmed PA detection. In cases where PA has never been detected in the area previously, the risk of a false positive means that it is important to ensure the accuracy of the result before undertaking substantive communications and mitigation works. The validation process therefore requires additional testing before confirming a new PA detection.

Prior to surveillance programmes beginning in an area, a shared understanding of the validation process is needed, along with an agreed approach to communicating results amongst relevant parties (such as landowners / managers, mana whenua and regional or district councils).

Standardising surveillance training

Over 20 individuals have been trained to conduct ground surveillance via Tiakina Kauri funding, with surveillance programmes being run over a number of forests as a result. Across Kauri lands, there are a number of training standards and methodologies. A priority over the next Operational Plan Term is to formalise a national programme standard for surveillance training to be utilised across agencies and forests.

Future investment priorities

Tiakina Kauri prioritises and encourages investment in research 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 and methods
- modelling and mapping risk of PA and disease presence and spread
- use and improvement of monitoring and surveillance technologies (such as remote sensing and artificial intelligence).

More information can be found on these priorities in the “Science and Research” section.

Outcomes sought over the 7-year National Operational Plan term

Now that we have mapped the majority of large Kauri in Kauri forests, and have an understanding of effective management practice, over the National Operational Plan, the priority is to:

- Identify and map individual Kauri in priority unmapped areas
- The presence and absence of PA is mapped across Kauri lands
- Containment & exclusion areas have been established across Kauri lands
- Understanding of the impacts of PA on Kauri forests over time has increased
- The application of PA control tools, Mātauranga Māori, and other management practices to manage the spread of PA are prioritised based on living maps.

This work programme will include having baseline population and risk level mapping completed for all major forests, with surveillance and monitoring plans being carried out in as part of strategic and adaptive Forest-Based (Kauri Ora) plans.

6. Pou 3 - Science and 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.

Relationship to the National Pest Management Plan
A number of the principal measures to achieve NPMP objectives either refer directly to growing and utilising our PA and Kauri knowledge base – or relying 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;
- carrying out surveillance and monitoring to enable—
  - (i) mapping of the distribution of Kauri and Kauri forests;
  - (ii) mapping of the presence or absence of PA;
  - (iii) an understanding of the rate of the spread of PA;
  - (iv) an understanding of the impacts of PA on Kauri and forests;
  - (v) an understanding of the application and effectiveness of PA control tools, Mātauranga Māori, and other management practices to manage the spread of PA;
  - (vi) an understanding of the levels of compliance with the requirements of the Plan;
- 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;
- applying effective treatments to Kauri; and
- 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; and
- 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.

6.1 Science and Research

Several research funding priorities have been identified within the Kauri protection programme's science plan (found here), which supports the achievement of the NPMP objectives. Five of these themes 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 or simultaneously within resourcing limits. An update to this Science plan is being developed.

Theme 1: Biology of Kauri and PA
Research that increases our understanding of the biotic and abiotic[4] factors that increase pathogen spread and disease incidence/severity is a priority. This will inform where to apply different management strategies.

Tiakina Kauri encourages research aimed at determining the average latency period (the time it takes a tree to first show visible disease symptoms after infection), the factors that influence variation in the latency period, and 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. Seedlings previously identified, through the Healthy Trees Healthy Futures programme, to possess traits correlated with PA resistance are being monitored for resistance.

<u>PA genome assembly</u>
The complete PA genome has been assembled, paving the way for researchers to understand things like how *Phytophthora* pathogens infect their hosts and cause disease, which can inform new methods for disease control. Pathogen genome sequences can be used to develop and improve diagnostic tools for detecting PA. Work is currently underway using novel primers, designed from genome sequences, for detecting PA DNA in soil samples.

Theme 2: 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, are a priority under this theme.

Theme 3: Building public/community engagement and social licence
It is 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 (measured by impact) or most underrepresented.

Theme 4: 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. Promising research is underway, aimed at providing lower-cost, high throughput and highly sensitive molecular testing for PA in large volumes of soil. Initially, Tiakina Kauri is interested in research investigating how to improve the tools we currently have (such as phosphite); however, this will change in future years if the current tools are not able to be optimised.

Theme 5: 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 focus is to better understand Māori-led management strategies and solutions (such as 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.

[4]Biotic factors are living things within an ecosystem, such as animals, plants and microorganisms, while abiotic are non-living factors, including the ecosystems hydrology, soil and atmosphere.

Outcomes sought over the 7-year National Operational Plan term:

- Ongoing improvements to standard operating procedures and protocols are made, with increasing efficacy and accuracy in methods, including for testing, hygiene practices and PA decontamination.
- Optimum phosphite dose rates for large Kauri trees has been developed, monitoring the length of protection from a single dose.
- Knowledge on risk factors , is shared and operationalised, through hui and wānanga with researchers and knowledge holders.

6.2 Mātauranga Māori

An objective of the Kauri Protection programme is to ensure that the NPMP recognises and supports the use and application of Mātauranga Māori in the fight against the spread of the PA pathogen.

Mātauranga Māori literally translated means “Māori knowledge”. This term broadly includes traditions, values, concepts, philosophies, world views and understandings derived from uniquely Māori cultural points of view. It is important to the way we in Aotearoa New Zealand maintain and restore our environment, drawing on place-based values and practices distinct to a Māori worldview.

Concepts and terms illustrate the importance of Mātauranga Māori in determining how Māori operate within native landscapes, and a Māori way of being and engaging in the world. In its simplest form, Mātauranga uses kawa (cultural principles) and tikanga (cultural practices) to critique, examine, analyse, and understand the world.

Mātauranga was held by tupuna (ancestors), with knowledge transmitted across generations. Mātauranga Māori is different from modern science in the way Māori formulate their initial questions and the approach in searching for answer.

Mātauranga Māori in Kauri Ora Plans

A forest and collaboration based “Kauri Ora plan” template (described further in the “Forest and Risk Decision-Making” section) has been developed with Mātauranga Māori in mind. The template opens with a description of the Mātauranga Māori within the name and symbols of Tiakina Kauri and moves to a description of what Mātauranga Māori within the context of this programme. Mātauranga Māori may be incorporated throughout planning elements – such as surveillance and monitoring planning, including cultural health indicators in combination with soil sampling and tree health assessments – or Mātauranga Māori could be treated as a separate work programme – such as standalone sections for Pūrākau or Maramataka. This template provides support for achieving the principal measure of “applying Mātauranga Māori, including cultural harvest... to the management of PA”, allowing for place-based solutions.

Rongoā application

The Tiakina Kauri programme supports Mātauranga Māori expertise and knowledge directly, in the application of rongoā on Kauri and surrounding pa-kainga to prevent the spread of the PA pathogen. Both recognised knowledge holders have been supported previously by regional and national Māori organisations. Central to this is the Mātauranga associated by extracting and producing rongoā which acknowledges the close relationship and connection between the atua Tane Mahuta and Tangaroa. This work has included transmission of this Mātauranga, by holding wānanga throughout Kauri lands.

Outcomes sought over the 7-year National Operational Plan term:

- Kauri Ora Plans incorporate Mātauranga Māori.
- An understanding of the medium to long term effectiveness of Rongoā treatments has been built.
- Mātauranga Māori transmission has been, and continues to be supported and enabled via wānanga, hui and consultation with knowledge holders.

7. Pou 4: 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, the frequency and distance of movement, and the likelihood PA being present in the area(s) of movement. By far the greatest movement of the pathogen is attributed to human activities, with a number of observational studies implying that the movement of contaminated soil on people, vehicles and equipment, represent the greatest risk of spread. The next controllable factor of PA spread is the movement of ungulates (hooved animals) – wild or domesticated.

These risks can be mitigated by changes in behaviours (e.g. hygiene or planning practices) and forest management approaches such as improved infrastructure (e.g. mitigated tracks and fences to exclude animals) and wild animal control.

Risk management, behaviour change and compliance

While all NPMP rules were developed for the purpose managing risk – not all risk management practices can, or should, be regulated. This means that, while being in compliance with the NPMP rules has heavy overlap with forest and risk management action, the NPMP rules should be interpreted as a minimum requirement, not an exhaustive list of actions to be taken towards protecting Kauri. This is why it is important that forest managers consider the “Principal measures (or actions) for achieving the objectives”, as well as the rules, when looking at the intent of the NPMP.

7.1 Forest and Risk Management Decision-making

Background

Kauri forest owners, managers and kaitiaki have a unique role in Kauri protection. The decisions made by these organisations and individuals have lasting effects on the spread of the PA pathogen and the health and wellbeing of Kauri. With the inevitable limitations on time and funding, it is important that forest and risk management decision making is efficient and effective, supported with the best available situational knowledge – such as the absence or presence of the PA pathogen and risk factors – and the most effective management approaches for addressing identified risks to Kauri health.

Risk management decision making looks different, dependent on whether you are looking at a single area of forest or across multiple forests with differing values, risk factors and communities. Tools to support these decisions are found below.

Outcomes sought over the 7-year National Operational Plan term:

- Local actions are supported and prioritised in line with Kauri Ora Plans and known risk facts, including; installing fencing, hygiene stations, upgrading tracks, conducting wild animal management.
- Nationally significant projects have been identified, prioritised and actioned.
- Best practice roadmaps, determine monitoring needs, and increase our understanding around operational Kauri forest management practices, starting with wild animal control, will be implemented.
- A Kauri Protection Area policy will be in place, with candidate areas being progressed in line with this policy.

7.1.1 Forest-based Kauri Ora Plans

As part of a marae-based wānanga - with participation from mana whenua, regional councils and the Department of Conservation - a programme-wide forest-based planning approach was developed – called a "Kauri Ora Plan". The Kauri Ora Plan template was established to support the achievement of the National PA Pest Management Plan objectives and was built off the actions detailed in the principal measures of the Plan. Kauri Ora Plans emphasize the importance of risk-based, evidence-based and partnership driven approaches to protecting Kauri forests. The plans map the communities around a forest for planning of education and outreach, provide space for determining what capabilities would be useful to foster within the forest-centred partnership, and support the Mātauranga Māori transmission and approaches alongside western derived solutions for Kauri treatment and protection.

Included in Kauri Ora Templates (amongst others) is a risk matrix, for the use of forest planners and operational staff – to support identifying the priority protection activities and to ensure protection actions themselves are mitigated (e.g. that hygiene practices are built into surveillance and monitoring or pest management activities). Use of risk matrices are endorsed as a mechanism for highlighting and prioritising risks for mitigation within planning processes.

Risk Matrix				
Likelihood	Consequence			
	Minor (A)	Moderate (B)	Significant (C)	Severe (D)
Certain (4)	Mountain bicycles Bike tracks	Hunting Nurseries Stock movement Wild hooved animals	Stockpiling materials (overburden, sand, gravel) Quarrying	Earthmoving machinery Forestry operations
Likely (3)		Horses riding Off track activities (sampling, geocaching, trapping, applying treatments).	All recreational off-road vehicles	Haulage trucks Farm machinery
Possible (2)	Bee keeping Walking on mitigated tracks On leash dog walking	Trail runners On track events Backpacks	Garden hand tools Any vehicle on gravel roads	Landscaping Revegetation
Unlikely (1)				

Mapping forest features and PA presence
To support effective forest-based planning, risk factors that are identified should be geographically mapped. These factors, such as those in the above matrix, interact with a number of other factors – and particularly the presence or absence of PA. Carrying out surveillance and monitoring is therefore an important step for effective forest management. Once known, risk factors and PA distribution can be combined with factors such as the slope / gradient of the land, natural movement of water and historic forestry operations, to provide a risk "heat" map – for prioritising effort and resources to where they will have the greatest impact. For more detail on risk mapping, see the "Surveillance and Monitoring" Section.

7.1.2 Forest management actions

Animal Vector 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

Wild animal management
Wild animal management reduces the number of animal vectors within a forest, though, 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 wild animal management options with less risk of spreading PA are considered first, and that, where forest entry is required, thorough hygiene measures are undertaken (see the Forest Visitors and Workers section). 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 (i.e. are not wandering through forests without the handler oversight). A best practice guide for off-track activity will be available in early 2025 at www.kauriprotection.co.nz/resources/best-practice-guides.

Stock Animals and fencing
Stock animals entering into Kauri forests as a result of intentional undergrazing or insecure or insufficient fencing pose a risk of PA spread. Installing and maintaining fence lines is an important step for protecting Kauri. Where there is a positive PA detection in a forest, within 500m of where a stock animal may enter that forest, fencing is required by Rule 6 (see the "Stock Owners and Grazers" section for more information). However, all stock movement within or between Kauri forests poses risk of PA spread, and PA presence is not exhaustively mapped, so fencing off forests is an important step regardless of the current understanding of the PA status of the forests in question.

People and vehicle vector management
The movement and activities of people within Kauri forests increase the risk of PA spread. Our infrastructure in and through Kauri forests can either mitigate or contribute to this risk – 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).

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.

National guidelines for roading and tracks that run through Kauri forests are in draft and will be finalised and published on the Kauri Protection website.

Cleaning stations

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 cue for the public of Kauri protection aims and obligations. These stations are often used for walkers / hikers – but bike cleaning stations and vehicle cleaning stations can be installed to great effect. 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. All cleaning stations installed need a maintenance plan in place that is strictly adhered to, as malfunctioning stations pose risk to the forests they aim to protect.

Informing visitors and workers

If a forest is being accessed by visitors (e.g. is a recreational reserve) or workers (e.g. to perform off-track pest management), forest managers should consider mechanisms by which they may inform these individuals on how to protect their Kauri while in and around the forest. This could be through on-boarding procedures and documentation including hygiene requirements, signage to communicate NPMP or site-specific requirements or, in the case of public tracks, the use of track ambassadors at busy times of the year (see the "Behaviour Change" section for more options and resources).

Applying and researching treatments

Treating Kauri for PA infection is a principal measure of achieving the NPMP objectives. Fungicides and rongoā Māori treatments are being researched and can applied to individual trees to reduce the impact of PA infection, though further research is required to understand their efficacy, proper dosing rates and any effects on the surrounding environment.

- applying effective treatments to Kauri

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. This research report is available in our database: www.kauriprotection.co.nz/research/research-database. Research is required to determine the long-term or non-target effects of phosphite injections on Kauri as this is not yet known.

Rongoā treatments

Rongoā treatments, made from non-toxic ingredients, are being applied to Kauri throughout Kauri lands as part of forest management practices. For more information, see the "Mātauranga Māori" section.

7.1.3 Between forest mitigation decision-making

Tiakina Kauri, the Department of Conservation, Regional Councils and mana whenua with large rohe often have to apply limited resources across multiple forested areas.

When deciding between the many available Kauri protections actions, the following should be considered:

- **Forest attributes,** including: forest size, ecological values, cultural values and the density of Kauri;
- **Risk profile**, including: the likelihood and impact (see risk matrix below) and whether the risk is of PA introduction or PA spread;
- **Mitigation effectiveness**, including: the extent to which a proposed action mitigates the risk of spread / introduction or reduces the impact of PA;
- **Facilitating safe access**, an objective of the NPMP is to "facilitate controlled access to kauri forests where it does not compromise the future or protection of kauri." This is because in, most cases, forest closure is the most effective PA spread mitigation, however, this must be balanced against New Zealanders right to visit and be connected to the natural environment; and
- **Ability to partner**, including: the level of partnership / collaboration, the ability to build capability of mana whenua in the course of carrying out works.

Tiakina Kauri Forest-based Decision Making

Where funding is available, forest-based mitigation projects will be supported in line with the National PA Pest Management Plan principal measures and considering the factors listed. Single-forest proposals are accepted in the Kauri Ora plan format, as described in the previous section. In cases where funding is being sought by an organisation with responsibility over multiple forests, nationally or regionally – the expectation is that these criteria will be applied when determining which projects are prioritised and submitted. Tiakina Kauri will then assess proposals as a collective, twice a year. This is done by applying the decision-making criteria, and then submitting resultant funding recommendations to the Tiakina Kauri Governance Group for review and Deputy Director-General Biosecurity New Zealand for Biosecurity approval.

Stocktake of current Kauri Ora activities

To inform long term decision-making and prioritisation, an initial priority is a stock take of protection and mitigation activities, forest attributes and partnerships across Kauri lands and forests – to form a national, cross-organisation view, ensuring effort is aligned with risk and identifying where mitigations are absent or insufficient.

7.1.4 Kauri Protection Areas

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. Collective agreement and establishment of Kauri Protection Areas is a priority for NPMP implementation moving forward, working with mana whenua, regional councils and the Department of Conservation to identify and protect key forest.

The NPMP states that a Kauri protection area may be established in a Kauri forest, provided the landowner agrees to this status and the area 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; and
- it contains iconic Kauri or stands of Kauri.

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; and
- 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 landowner)
- Other legislative tools (such as the Conservation Act 1987)

7.2 Behaviour change

Desired outcome: The public, businesses and landowners/managers are invested in Kauri protection, aware of their obligations under the National Pest Management Plan and are actively meeting them.

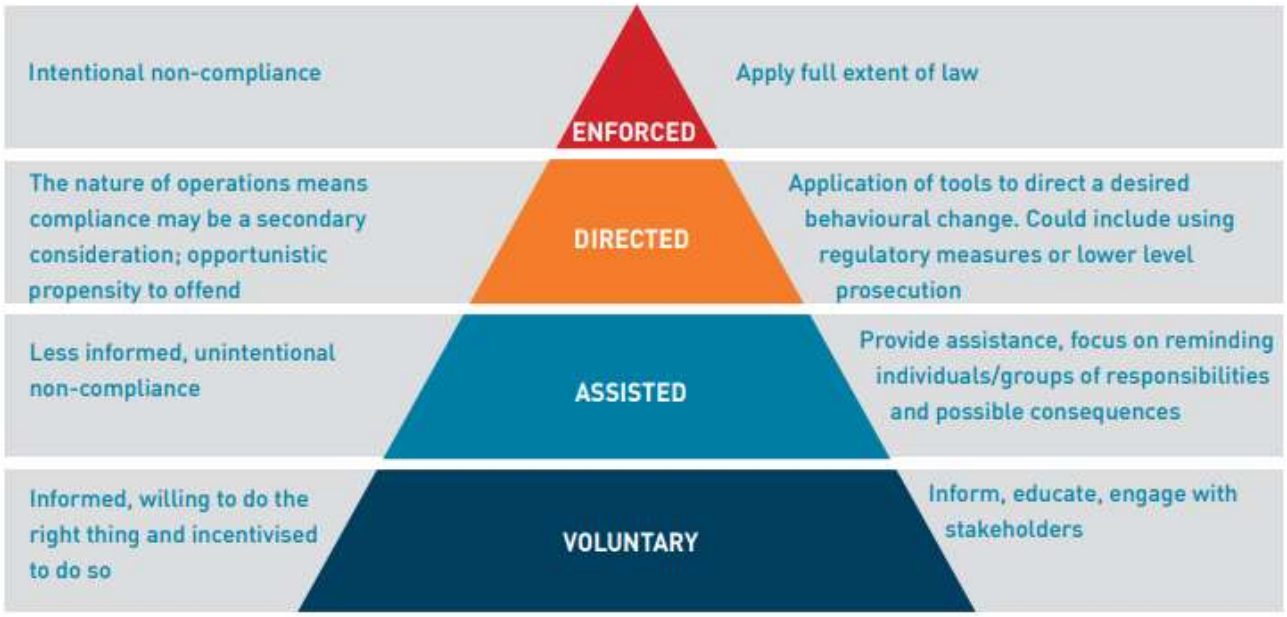
Outcomes sought over the 7-year National Operational Plan term:
General audiences, specific activity groups and businesses understand and are in compliance with the national plan rules. Best practice has been embedded into planning resources, guidance, standards and protocols, capturing the latest advice and requirements, and is available to all groups that interact with Kauri and championed by Tiakina Kauri and programme partners and collaborators.

National Compliance Plan
A National Compliance Plan is in use:
- Containing policies and processes for the application of all NPMP rules and the use of Part 6 powers.
- Leveraging various other legislation / regulation that also has responsibilities in relation to Kauri,
- Building a picture of compliance with the rules and monitors changes over time.
- Maintaining a fit for purpose Authorised Person training and accreditation programme, with Programme collaborators and partners being authorised under the NPMP.

7.2.1 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 primary approach taken will be to inform, educate and engage with stakeholders – with the aim to increase awareness and understanding of the NPMP, and in turn, voluntary compliance. This approach is detailed further in the following sections. In cases where non-compliance is serious (high risk or high impact) or repeated, other compliance will be considered in line with national policies and processes.

National Compliance Plan

Meeting the NPMP objectives requires a national compliance plan, which takes into account national priorities, local contexts and the available capability and capacity. Over the last National Operational Plan term, a high-level compliance framework was developed, along with supporting guidance and templates. Development of an Authorised Person training programme was begun, with roll out planned for FY24/25 – in line with a finalised compliance plan, describing roles and responsibilities across organisations, land tenures and regions.

The Plan rules and powers

The NPMP introduced 10 rules, largely focused on supporting the management agency building a picture of Kauri health, encouraging good hygiene practice and risk mitigation planning, reducing the number of animal vectors within forests and setting a minimum requirement of track and road infrastructure in forests. These are outlined further in Table 5 below – and Section 8 “Rule application policies”. The NPMP Order also specifies the particular Biosecurity Act 1993 Part 6 powers that may be applied to Plan implementation. These, along with details on the offence types and penalties, are detailed further in Section 12 “Legal Framework”.

Table 5: Summary of the National PA Pest Management Plan rules

#	Rule name	Intent of the rule	Applicable to
1	**Obligation to report***	Requirement to report symptoms of disease in Kauri	Occupiers (see section 8.3.1)
2	**Provision of Information***	Requirement to respond to questions relating to PA, if asked	Occupiers (see section 8.3.1)
3	**Restriction on the movement of Kauri***	Requirement to have and operate in accordance with a Production Plan, if growing Kauri for movement.	Plant producers (see section 8.2)
4	**PA risk management plans**	Requirement to have a PA Risk Management Plan if your property is at risk of PA spread	Occupiers (see section 8.3.2)
5	**Earthworks PA risk management plan**	Requirement to have an Earthworks PA Risk Management Plan if disturbing Kauri roots	Occupiers, Infrastructure, earthworks and forestry companies (see section 8.3.3)
6	**Stock exclusion notice**	Requirement to exclude stock if they can access a forest within 500m of a PA positive site	Stock owners and grazers (see section 8.3.6)
7	**Restriction on release of animals**	Prohibition on releasing animals into Kauri forests.	Forest visitors and workers (see section 8.1)
8	**Obligation to clean items before entering or exiting Kauri forest**	Requirement to clean risk items when entering/exiting forests	Occupiers, Forest visitors and workers (see section 8.1)
9	**Obligation to use cleaning stations**	Requirement to use all cleaning stations you encounter.	Occupiers, Forest visitors and workers (see section 8.1)
10	**Open tracks and roads in Kauri forest**	Minimum requirement for tracks and roads in Kauri forests.	Occupier (see section 8.3.4)

*Applies nationally. All other rules apply only within Kauri land regions.

7.2.2 Communications and Awareness

'Give Kauri Space to Grow'

Following the National Plan coming into effect in August 2022, Tiakina Kauri has focused on raising high-level awareness of the Plan and its rules. Tiakina Kauri ran a 'Give Kauri Space to Grow' public awareness campaign in both FY23 and FY24 to deliver to our FY23-24 objectives of:

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.

Together, the campaigns delivered over 25 million advertising impressions cost effectively across a range of physical and digital channels and reached over 1.8 million New Zealanders from digital channels alone. Feedback we received about the campaigns was overwhelmingly positive, and the campaign artwork won a silver Axis Award.

Having restarted a positive conversation about Kauri, and raised high-level awareness of the National Plan, the next step is to increase awareness and understanding of the rules among audiences with the highest risk of PA spread, as well as those that have significant knowledge gaps, while retaining the goodwill of these audiences for protecting Kauri.

Principles for implementation

Tiakina Kauri communications activity adhere to the following principles:

- continuity of overarching 'Give Kauri Space to Grow' campaign messaging and direction;
- developing specific, relevant messaging for each audience to ensure cut-through and engagement;
- using a range of appropriate communication channels to reach each audience;
- producing supporting resources as relevant for various audiences; and
- leading, supporting and aligning activity, based on who is best placed to deliver behaviour change outcomes.

The achievement of our objectives will be supported and complemented by the following:

Digital channels

The Tiakina Kauri website and social media channels will continue to be maintained as the 'one source of truth' for information about Kauri and the National Plan, and as the home for guides and resources.

Programme stakeholder support

Key messaging will continue to be updated and circulated as required. 'Give Kauri Space to Grow' merchandise, including hygiene kits for off-track audiences, will continue to be provided to stakeholders to support advocacy, events and other outreach activities.

Te Ao Māori

A Te Ao Māori approach continues to be considered and incorporated into the content and design of communications and engagement materials, to reflect the role of mana whenua as co-leaders of the National Plan.

Public support and awareness survey

A Verian survey was carried out in May 2024, after two 'Give Kauri Space to Grow' campaigns, with encouraging results, including that:

- the vast majority of New Zealanders support the idea of protecting Kauri (92%) and believe they have a role to play in managing the PA pathogen (80%)
- since 2018 support significantly increased for track closures (63% vs 91%) and rāhui (41% vs 84%)
- those that recalled seeing the campaign were more likely to;
    - be aware of the National Plan (31% vs 69%),
    - believed they had a good understanding of the plan (69% vs 77%)
    - agreed it was a positive (78% vs 85%)

Signage design and guidelines

The recent Verian survey revealed forest signage to be the most common channel by which New Zealanders had heard something about protecting Kauri. Over the previous National Operational Plan term, new Kauri forest signage designs and signage guidelines were developed in consultation with

members of the Tiakina Kauri | Kauri Protection programme. The new designs align with the 'Kauri Ora' direction of the Tiakina Kauri programme and the rules of the National Plan, and the new signs are now being rolled out organically across Kauri Lands, with Tiakina Kauri providing an initial boost of funding for the production of new signage. For signage guidelines contact Tiakina Kauri on Kauriprotection@mpi.govt.nz.

7.2.3 Education and accreditation

Over the National Operational Plan term, Tiakina Kauri will raise awareness and understanding of the rules of the National Plan through activity and campaigns targeted to audiences impacted by the National Plan rules – beginning with those that have a high risk of PA spread and/or knowledge gaps about the National Plan. This activity will utilise a range of communications channels and incorporate the development and sharing of relevant templates and best practice resources, as well as weaving in face-to-face delivery of workshops/presentations and the development and roll-out of compliance, training and accreditation programmes.

Education, awareness and organisational accreditation activity is also carried out by partners and collaborators – funded by Tiakina Kauri and by their own organisation. These activities contribute to achievement of the NPMP objectives and principal measures and leveraging local and central efforts and expertise is key to successful implementation over the National Operational Plan term.

Ambassador programmes

Track ambassador programmes are a valuable tool for raising awareness with recreational forest visitors, with programmes being run at high volume tracks over the summer months, throughout Kauri lands. Tiakina Kauri supported 25 track ambassadors to operate over the summer periods of 22/23 and 23/24 – in addition to the successful track ambassador programmes run by mana whenua councils, community groups, Regional Councils and the Department for Conservation – educating forest visitors on cleaning practices that reduce the risk of PA spread.

School resources and programmes

Since programme inception, resources have been provided to educate school aged children about Kauri and the steps taken to protect them – this has included supporting the development of booklets and teacher resources (such as these), an award winning virtual reality experience (driven by Waikato Council) and field trips to forests and laboratories. Working with schools, kura and universities remains an approach supported to raise a generation of New Zealanders that care for Kauri trees and forests, which has been successfully delivered by partners and collaborators throughout Kauri lands.

Accreditation for working within forests

Over the coming National Operational Plan Term, Tiakina Kauri seeks to develop an accreditation programme for working safely near Kauri – including a programme inspired by the Western Australia's Green Card Training™, for Phytophthora Dieback. This programme provides certification of best practice for those working with vulnerable vegetation that has now become an industry requirement in a number of instances. A similar programme here would provide individuals and organisations with the required knowledge to work safely in Kauri forests and would provide confidence to landowners and managers that works carried out on their land will be done so with the welfare of Kauri in mind.

Community groups, support and advice

Councils play an important role in Kauri Protection – as the "front door" to Kauri land communities – working with community groups and volunteers, providing advice on how to manage biosecurity risks within their regions and acting as a liaison with Tiakina Kauri as needed. To support these interactions, a number of resources for different audiences are being updated; these can be found at www.kauriprotection.co.nz/resources

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 continue to be the primary means of increasing this measure over the coming NOP term.

8. Rule application policies

The NPMP applies to a number of individuals, organisations and activities. Further detail on rule application can be found below. Enforcement of the NPMP rules can be carried out by Authorised Persons, Inspectors and the Tiakina Kauri Management Agency. To ensure fairness and consistency – Tiakina Kauri has a Compliance Framework that details the process for conducting compliance action. This will be elaborated and built on in the finalised National Compliance Plan.

8.1 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 at: www.kauriprotection.co.nz/resources/best-practice-guides. 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 www.kauriprotection.co.nz). 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.

Releasing Animals for hunting

In addition to the need to clean ground touching items when hunting in Kauri forests, 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. This is ungulates (hooved animals) have the potential to move dirt throughout a Kauri forest – acting as a PA vector.

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.

8.2 Plant producers

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 favour pathogen growth, due to conditions such as high moisture and warm temperatures. Additionally, results of surveillance to date suggest that some of the current 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 nationally, when growing Kauri for movement / sale, 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.

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 at www.kauriprotection.co.nz/resources/best-practice-guides/nurseries/.

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

Research into whether there are alternative hosts of PA has confirmed that other species besides Kauri can become colonised by the pathogen in glasshouse and field conditions. Given the low levels of pathogen inoculation in experimental field trials, it is unlikely that alternative hosts are a significant inoculum source in forest soils within infested Kauri stands. However, alternative hosts may be of significant concern to plant producers, as most plants infected with PA in glasshouse trials were colonised by the pathogen. Reports from the alternative host research performed by Scion and Plant and Food Research can be found in our research database: www.kauriprotection.co.nz/research/research-database.

8.3 Owners and occupiers of land with Kauri present

Background

Owning, occupying or managing land containing or bordering Kauri forest or trees means taking into consideration Kauri protection and the NPMP requirements.

These can include (but are not limited to):

- reporting suspected disease in Kauri;
- installing, maintaining or upgrading 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 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); and
- cleaning risk items when entering and exiting forests (as described in Forest Visitors and Workers section).

8.3.1 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.

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 the Kauri Protection website (https://www.kauriprotection.co.nz/about-kauri/identify-the-disease/). 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.

8.3.2 Risk management plans

Risk management plans are a key tool for landowners, 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 where the land is at risk of PA spread (as per Rule 4).

A PA Risk Management template can be found at www.kauriprotection.co.nz/resources/best-practice-guides.

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.

While all sites with a positive PA detection meet the rules definition of "at risk of PA", where there is limited resource, requests will be prioritised based on the likelihood and impact of onward spread.

8.3.3 Earthworks and land disturbance

Plan rule 5: earthworks PA risk management plan requires most land disturbances/earthworks conducted within a Kauri tree hygiene zone be carried out in accordance with an approved earthworks risk management plan.

Where possible, earthworks 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.

2) 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

A template for the Earthworks PA Risk Management Plan can be found at www.kauriprotection.co.nz/resources/best-practice-guides.

Requirements under the Resource Management Act 1991

Some district councils have restrictions or requirements relating to earthworks/land disturbances near Kauri roots, for this reason 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

Rule 5 requires that organic material from within a Kauri Hygiene Zone must be disposed of in an approved landfill in order for an Earthworks PA Risk Management Plan to be approved. A list of landfills for the disposal of contaminated soil, sludge, or organic material can be found on the Kauri Protection website and will be reviewed and updated to confirm approved sites for the purpose of rule 5. For situations where it is not feasible to utilise one of these landfills (e.g. the volume of soil is too large), a policy will be developed detailing the options in relation to feasibility and relative risk.

8.3.4 Tracks and roads

The presence of tracks and roads within Kauri forests can mitigate or exacerbate the risk of spread by people and vehicles. Rule 10 specifies the minimum requirements for public roads and tracks that run through Kauri forest:

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.

Controlling access

The scale of movement on a track or a road contributes to the risk of PA spread, for this reason the rule applies specifically to tracks and roads intended for public use. In situations where a road or track is accessible to the public but not intended to be for public use, and public access is not guaranteed by legislation, this should be made clear through physical barriers / gates and or signage.

Planning works and upgrading tracks and roads

Programme Track and Roading standards are under development and will be published on the Kauri Protection website once finalised to support construction that complies with Rule 10 and reduces the risk of roading and track networks contributing to PA spread. When upgrading or building roading it is important to note that an Earthworks PA Risk Management Plan is required when the works include disturbance within a Kauri Hygiene Zone (see the "Land Disturbance" section above).

8.3.5 Earthworks, infrastructure and forestry companies

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, machinery 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 here: www.kauriprotection.co.nz/resources/best-practice-guides.

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

And a measure of NPMP success is:

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

As detailed below, Rule 5 requires contracted 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 contractor may prepare an Earthworks PA Risk Management Plan on behalf of an occupier – provided they have occupier consent.

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 local authorities or the management agency if an emergency has resulted in significant amounts of soil or organic material being displaced 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).

8.3.6 Stock owners and grazers

Background
Stock animals (such as 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 landowners can be found on at: www.kauriprotection.co.nz/resources/best-practice-guides.

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 (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.

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 (Clause 13). 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) to 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. Some support is provided for fencing costs by regional councils.

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.

9. Data sharing and Management

9.1 Information sharing and ownership

Data access is currently managed via contract or grant agreements. Tiakina Kauri stores PA diagnostic results and tree health assessments collected as part of surveillance grants. Access to this data is limited to the organisation that collected data and to Tiakina Kauri, at present. These agreements state that Tiakina Kauri may share this data (with permission) when it is required to implement the NPMP. Formalised data sharing arrangements will be developed to allow greater transparency and collaboration across organisations, to build a collective regional and national pictures of Kauri health and wellbeing. When working with Māori or on Māori-owned land, a partnership approach will be employed in these 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. The database has direct external access for registered partners.

9.2 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 its 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.

10. **Reporting**

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

Category	What will be monitored and recorded
the management agency's level of understanding of the distribution of PA across Kauri lands and Kauri forests	• % of kauri forests mapped • Number of tree health surveys conducted • Number of Areas of Interests' identified as part of a surveillance plan • Proportion of kauri forests with risk maps
the level of resilience of Kauri forests in response to PA:	• Number of trees being treated with phosphite • Number of trees treated with rongoā • Changes to forest health over time
the level of public and industry engagement in the management of PA:	• Number of wānanga and events hosted hui • Level of collaboration between Kauri Ora groups (qualitative) • % of funding towards mana whenua carried out works • Number of workshops, sessions or fieldtrips run at schools, holiday programmes, universities or kura • % of people who think it is important to protect Kauri • % of people who believe we all have a role to play in making sure that the PA pathogen does not spread • Number of people and businesses reached by behaviour change campaigns. • Number of page views of Tiakina Kauri website content for businesses and industry.
the management agency's available access to capability, knowledge, and tools to support effective management of PA:	• Number of individuals certified in relevant capabilities • Number of projects in progress and completed, in line with Science plan • Number of scientific talks presented at wānanga, hui and events • Number of Mātauranga Māori wānanga, hui and events hosted • Number of individuals accredited in hygiene practices • Number of Kauri Ora Plans in place

Category	What will be monitored and recorded
the number of physical PA spread mitigations:	• Number of wild animals managed • Number of hygiene stations installed • KMs tracks or roads upgraded to meet standards • Metres of fencing installed to exclude stock
the level of compliance with the requirements of the Plan.	• % of people who have know about the National Plan or the National Plan rules • Number of plant producers certified with the Plant Pass Kauri Schedule • Number of Earthworks Management Plans approved • Number of PA Risk Management Plans approved • % of track users complying with hygiene station requirements • Number of sick tree reports received from the public / landowners

11. Budget

11.1 NPMP Funding

In Budget 2021, the government allocated $32M over a 5-year period to implement a National Pest Management Plan for Kauri Protection, until FY25/26. Current funding allocations can be found in Table 6 below.

Table 6: Funding by year

2021/2022	2022/2023	2023/2024	2024/2025	2025/2026	2026/2027
$8M	$8M	$8M	$4M	$4M	-

11.2 Tiakina Kauri Management Agency

The costs associated with running the Tiakina Kauri Management Agency are met by Biosecurity New Zealand.

12. Legal Framework

12.1 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 strict liability 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.

12.2 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. This means permission from a Chief Technical Officer is needed to transport material known to contain PA. For Kauri with potential PA infection (symptoms can be found here) , contact your local regional council or MPI. If you have a positive PA test and need to transport contaminated material off your site, permission must be granted by MPI; the permission form can be found on the MPI website.