

**O'CONNOR | SINCLAIR**  
*Leading Effective Decision Making.*

**Ministry of Primary Industries**  
**Kauri Dieback Decision Support Tool – Prioritisation**  
**Optimisation Intervention Framework**  
4/12/2015

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# 1 EXECUTIVE SUMMARY

## 1.1 INTRODUCTION

This project was initiated by the Kauri Dieback Programme (KDP), a joint agency response to the threat of *Phytophthora agathidicida* - a microscopic, fungus-like organism which has the ability to kill our beloved, native kauri (*Agathis australis*).

The purpose of the project was to develop a decision support framework which helps KDP partners to:

1. Prioritise sites they are managing (where resources are constrained), including:
  - a. Sites that contain high values (ecological, cultural, social) that require protection (i.e. high value priority); and
  - b. Sites that would present a high risk of disease spread to high values sites if left unmanaged (i.e. high risk priority).
2. Guide the choice of intervention at those sites.

The framework was to be: relatively high level; adaptable; flexible and not prescriptive, and achieve buy-in by partners.

## 1.2 PROJECT PROCESS

A six phase methodology process was adopted to develop the decision support framework. This is set out in Figure 1 below.

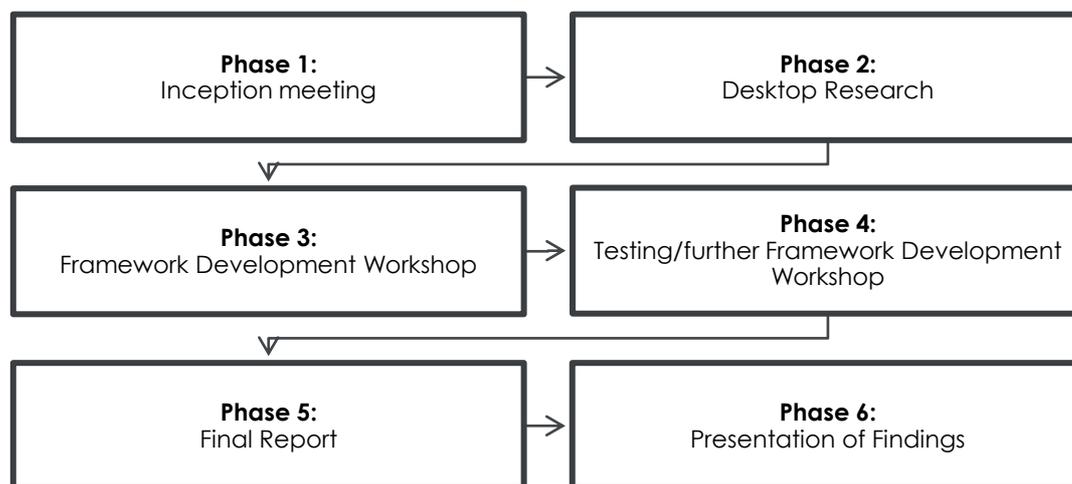


Figure 1: The project process

### 1.3 FRAMEWORK CONTEXT

During development of the framework, the surrounding context was considered. This related to both use of the framework, as well as the processes that may precede and follow its use. The various aspects of this context informed the development of the framework, and are set out below.

#### Who will use this framework?

The framework is intended for use by the KDP partners responsible for, or contributing to, operational management of sites where kauri are present. Each has its own unique context and particular operational challenges and issues, which were considered during development of the framework. The full write-up on each partner is set out in Appendix 2, however, the following themes in partner context were noted.

Table 1: Themes emerging after discussing partner drivers, and what this told us.

Theme...	What this told us...
Competing internal pressures and expectations on partners, particularly around which sites should receive attention.	Consistency around partner prioritisation of sites will be difficult to achieve across partners, when they have differing organisational drivers and starting points. This meant bringing the partners together to share and discuss decision making outputs was necessary, to create dialogue on their different approaches.
Partners experienced political pressure, and needed to apply for/justify funding for site intervention/management.	A framework which provides transparency in decision making (particularly across sites) would be beneficial. The framework should encourage all sites to be considered at one time, in one place and in a consistent way.
Resourcing issues across partners.	Prioritisation is a necessity.
Partners already have prioritisation approaches or frameworks in use.	If the framework does not provide additional information or "guidance", partners may revert to their current processes.
Lack of knowledge on the disease.	We would be limited in what we can include in the framework by the current state of science and research.

In addition, the current (different) approaches to prioritisation and intervention choice by each partner was reviewed. From this, it became clear that:

1. Partners had different approaches and philosophies on prioritisation, and prioritised sites based on different factors. This indicated the current approach to prioritisation appears to be inconsistent, and achieving consistency in future may be challenging.
2. Interventions are selected based on various characteristics/risks associated with a site (and the interaction between these). Intervention selection becomes a

weighing up of all particular idiosyncrasies of the site (and the region), involving consideration of the site's context and how the risks may be interlinked/exacerbated, before a decision is ultimately made, based on best judgment. This indicated that any attempt to identify "themes" in the types of sites, or the types of site characteristics – linked to a choice of interventions, was not possible (at least at this stage in the programme).

### **How could/should the framework be used?**

The processes/systems that could be implemented prior to actually undertaking the site prioritisation and intervention choice exercise (and how the decision making outputs might be used after) were also considered. This included:

- The process that should be in place for deciding who should/could be part of decision making
- The policy and strategy considerations for partners ahead of prioritising sites and choosing interventions, which should inform site intervention choice
- How the various decisions of partners could be fed back into the programme, to facilitate a better understanding of what partners are doing, and whether or not there is consistency.

During the workshops, it became apparent that although partners had initially agreed to a partnership approach, most were operating in silos and were focused on site interventions. For this reason, the framework needed to include a process which:

- Encourages a partnership approach
- Ensures partners consider/reflect on broader policy/strategy considerations
- Regularly brings the partners together after decision-making has taken place.

## **1.4 FRAMEWORK CONTENT**

The content for the framework came from the following places:

1. An international literature review.
2. Discussions with the project sponsors on the current research available about the disease – which may impact how sites could be prioritised or interventions selected.
3. Direct input from partners (during and between workshops), particularly in relation to:
  - a. Inputs into prioritisation, including the risk and significance factors.

- b. Information on interventions, used for intervention selection.

## 1.5 THE FRAMEWORK

The framework has been set up as an Excel spreadsheet. It contains 10 colour-coded tabs in the spreadsheet – with each tab setting out one part of the framework. These tabs are:

- Using the Framework
- Set-up and context
- Site Profile Framework
- Risk Assessment Framework
- Significance Framework
- Prioritisation Framework
- KDP Decision – Making Inputs
- Site Intervention Choice
- Policy Intervention Choice
- Post-Framework Questions

## 1.6 RECOMMENDATIONS

The project team makes the following recommendations:

1. Adopt and circulate the framework for testing. The framework should provide partners with a reference point for consideration when undertaking prioritisation and intervention choice.

Partners can adapt the framework, or borrow from it, as they see fit. This may involve partners deciding how to apply rankings within the framework (i.e. decide what “low, medium, high” means for risk and significance), for their sites. These criteria/rules would be applied within the framework by the partner, across each of their sites.

2. Allow the framework to be tested by partners, by applying the framework to their sites. The project team can gather again early in 2016 to discuss:
  - a. Use of the framework (what worked well, what did not work well).
  - b. Potential improvements.
  - c. Compare and contrast how partners are prioritising sites and selecting interventions.

Any further changes to the framework can be incorporated (and the framework circulated).

3. Schedule regular, ongoing partner communication, follow-up and input meetings (e.g. check-in forums). At these, partners can share how prioritisation is working,

and what is happening with site interventions/operations more generally. Include any partners who could be important to have here (for example the territorial authorities).

This would include any assessment of whether changes have been made to the way partners are undertaking prioritisation/intervention choice.

4. Regular re-consideration of the framework, to add to/change any risk or significance factors, or (when research becomes available), amend the interventions framework to include information on effectiveness or application.

For example, we understand Auckland Council is currently undertaking work on ecological significance (to better understand this). The results of this work could be included in the framework.

5. Continue to build on the framework, adding in any further work/materials/resources which become available through the kauri dieback programme, for example:
  - a. Best Practise Guidelines – agreed and ratified by partners.
  - b. The results of the regulatory assessment.
  - c. Guidance on a management unit/catchment area.
  - d. Capture/share information.

## 2 INTRODUCTION

### 2.1 BACKGROUND

"Kauri is a much loved tree species and has a special place in New Zealand's northern ecosystems and history. It shapes the character and function of forests where it occurs, is a taonga *tuku iho* of the Māori ancestral spiritual world and is of significant cultural importance to all New Zealanders."<sup>1</sup>



Kauri (*Agathis australis*) is a coniferous tree in the genus *Agathis*, found north of 38°S in the northern districts of the North Island. After heavy logging (from 1820 until approximately 1970) only small pockets of kauri forest are left in New Zealand.

Our remaining kauri are now being threatened by *Phytophthora agathidicida*, - a microscopic, fungus-like organism which has the ability to kill kauri of all ages, from saplings to trees over 1500 years old. If left unmanaged, the disease has the potential to kill all kauri.

"In New Zealand the discovery of diseased kauri (*Agathis australis*) in Northland in 2003 was a huge blow. When kauri trees in the Waipoua Forest started showing symptoms of disease a decade ago *Phytophthora* was the prime suspect.

*Species of Phytophthora (which literally means "plant destroyer") have been responsible for many serious plant diseases, including the Irish famine when potatoes became infected in the 1840s, but also more recently affecting a range of trees worldwide including oak, chestnut, alder and jarrah. Phytophthora is a soil-borne microbe (or water mould) ...further investigations showed ... the pathogen was... Phytophthora 'taxon Agathis' or PTA."*<sup>2</sup>

*P. agathidicida* has the ability to infect single trees or cause dieback of entire stands (hence 'kauri dieback'). Nearly all infected trees die and there is no known cure. Science's understanding and knowledge of the disease, including its spread, prevention and how to eradicate it, is limited. Research is ongoing. In addition – little is known about the sites where it exists, including site and forestry profiles, and landscape/ecological profiles. Further research is required on the disease, in order to develop evidence-based, scientifically endorsed best practice guidelines.

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<sup>1</sup> New Zealand's strategy for managing kauri dieback disease

<sup>2</sup> Landcare - <http://www.landcareresearch.co.nz/publications/newsletters/biological-control-of-weeds/issue-67/kauri-dieback>

After the discovery of *P. agathidicida*, the Kauri Dieback Joint Agency Response was initiated (the Kauri Dieback Programme or KDP) - a multi-agency reaction involving:

- Tāngata whenua
- Ministry for Primary Industries
- Department of Conservation
- Northland Regional Council
- Auckland Council
- Waikato Regional Council
- Bay of Plenty regional Council

The KDP partners work together, and individually, to prevent the further spread of *P.agathidicida*. They have developed New Zealand's strategy for managing kauri dieback disease (the Strategy), which includes the following outcomes:

1. Goal 1: Delivering effective operations.
2. Goal 2: Building knowledge and tools.
3. Goal 3: Engaging and enabling people and communities.

## 2.2 PROJECT PURPOSE

This project was initiated as part of the Strategy. It mainly contributes to the goal of delivering effective operations (Goal 1) while indirectly feeds into Goal 2 and 3. The purpose of the project was to develop a decision support framework which helps partners to:

1. Prioritise sites they are managing (where resources are constrained).
2. Guide the choice of intervention at those sites.

It is understood that the outcome sought by developing the framework is greater consistency around prioritisation of sites and operational management of the disease going forward and into the future. It is hoped that a consistent approach will give the programme a greater chance of protecting New Zealand's beloved kauri across landscapes by ensuring that partners consider all factors which may impact prioritisation and intervention choice.

Although most partners already have an existing prioritisation process in place, this project provided an opportunity for partners to feed into development of a framework for the KDP (and contribute to the national view), share their accumulated knowledge and help to create a resource for future use.

## 2.3 THE PROJECT BRIEF

### Prioritisation of sites

With regard to prioritisation, the brief noted that priority sites could be:

1. Sites that contain high values (ecological, cultural, social) that require protection (i.e. high value priority); and
2. Sites that would present a high risk of disease spread to high values sites if left unmanaged (i.e. high risk priority).

The brief sought criteria to guide the prioritisation at large scales (e.g. forests, parts of forests or management units that contain collections of forest remnants) and at fine scales (e.g. values along track networks, individual trees, stands of trees).

### Choice of interventions

With regard to the operational interventions, partners sought guidance on the optimal set of operational interventions that should be applied at that site in order to prevent the spread of the disease into or out of the site (depending on whether it is a high value or high risk priority). The programme sponsors noted that the decision support framework should be:

- Relatively high level and adaptable – able to be used by different partners for more detailed uses by operational agencies
- Flexible
- The criteria and decision support systems needed to provide a framework for decision making, but not specify what the decision should be for every situation, i.e. not prescriptive (particularly given the many “unknowns” about the pathogen’s spatial extent and the viability of some interventions to limit its spread).
- Have buy-in to ensure the criteria/frameworks are endorsed and used by all partners.

## 2.4 ABOUT THIS REPORT

This report outlines development of the decision support framework, including:

1. The methodology (Section 3)
2. Context, relevant to development of the framework (Section 4)
3. Where the content for the framework was obtained (Section 5)
4. An introduction/explanation of the framework itself (Section 7)
5. Recommendations (Section 8).

## 3 THE PROJECT PROCESS

### 3.1 THE PROJECT PROCESS

The process adopted when developing the decision support framework is set out in Figure 2, and described in more detail below.

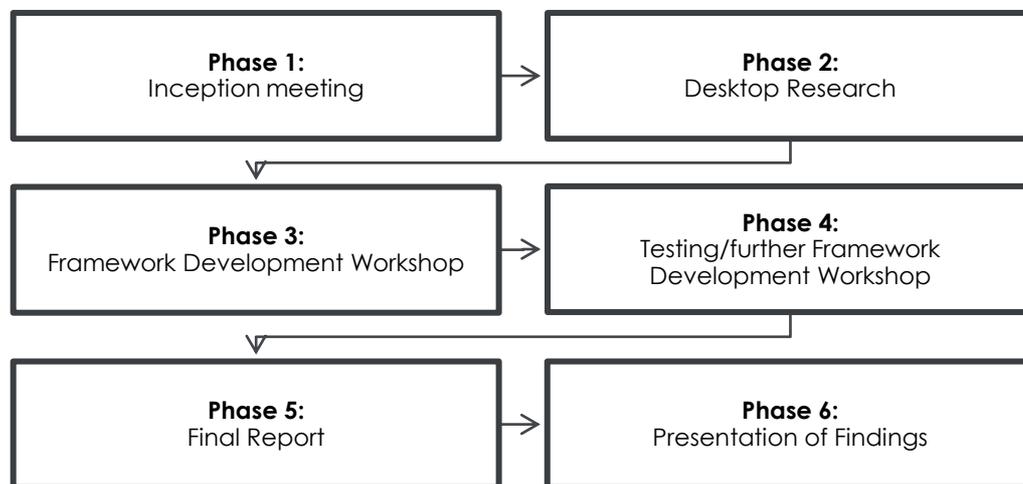


Figure 2: The project process

### 3.2 THE PROJECT TEAM

The project team involved in this project were as follows:

#### Partner sponsors:

- Travis Ashcroft (Planning and Intelligence Lead, Kauri Dieback Programme)
- Kim Brown (Operations Lead, Kauri Dieback Programme)
- Shana Harding (Strategic Projects Manager, Department of Conservation)

#### Consultants:

- Leo Shen (Senior Consultant, O'Connor Sinclair)
- Shelley Lomas (Consultant, O'Connor Sinclair)

### 3.3 THE STEPS TAKEN

During the course of the project, the Project Team adopted the following methodology:

#### Phase 1 – Inception meeting

21 September The project team met to confirm the process and methodology, and discuss the background to the project and current research.

## **Phase 2 – Desktop research**

02 October The consultants undertook desk research and produced a literature summary (attached as Appendix A).

## **Phase 3 – Framework development workshop**

12 October The consultants facilitated Workshop 1, with the purpose of obtaining information and input from partners on the considerations/criteria to be included in the framework. It was an information gathering workshop, where as a group, the project team sought to identify the factors which needed to be built into either prioritising sites, or selection of interventions. This informed development of the framework.

16 – 27  
October The consultants considered/analysed the workshop outputs and summarised these in notes (Workshop 1 notes are attached as Appendix B). Partners had an opportunity to add to/comment on these notes.<sup>3</sup>

## **Phase 4 – Testing and further framework development workshop**

28 October –  
12 November In Phase 4, using the Phase 3 outputs, a draft framework was developed for consideration by the partners.

13 November A second workshop was held with partners. The purpose was to test initial thinking, obtain feedback on the suggested approach, and obtain further information for inclusion in the framework (particularly relating to the degree of guidance that the framework could offer).

14 – 25  
November After the workshop, the consultants again considered/analysed the workshop outputs and summarised these in notes (Workshop 2 notes are attached as Appendix C). The framework was then refined/amended (informed by partner feedback). Partners were asked to indicate their levels of buy-in by way of a Survey Monkey Survey.

## **Phase 5 – Final report**

01 December This report was produced, outlining the methodology, results, final decision framework and recommendations for the project. It also sets out the constraints and uncertainty associated with the framework and level of buy-in from programme partners.

## **Phase 6 – Presentation of findings**

08 December The final framework and recommendations are presented (this will take place after the time of writing this report).

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<sup>3</sup> A digital platform was also set up for partners to comment and discuss the notes as a group, however, partners preferred to comment directly on the document.

## 4 FRAMEWORK CONTEXT

### 4.1 WHO WILL USE THE FRAMEWORK?

The framework is intended for use by the Kauri Dieback Programme partners responsible for, or contributing to, operational management of sites where kauri are present. The partners come from a variety of organisations, each with its own unique context and particular operational challenges and issues on the frontline (e.g. funding, varying agendas, private land ownership and relationships with other partners). The project team sought clarity on each partner's key drivers, issues and challenges, to gain an understanding of:

- How this may affect prioritisation (and whether there are implications for the framework)
- How the drivers/challenges may affect partner intervention choice

This was intended to inform development of the framework, to increase the likelihood it would contribute to partner decision making.

The full write-up on each partner is set out in the notes from Workshop 1 (attached as Appendix 2), outlining each partner's context in detail. From this feedback, the project team noticed particular contextual themes emerging, which alerted us to potential constraints within the framework.

Table 2: Themes emerging after discussing partner drivers, and what this told us.

Theme...	What this told us...
Competing internal pressures and expectations on partners, particularly around which sites should receive attention.	Consistency around partner prioritisation of sites will be difficult to achieve across partners, when they have differing organisational drivers and starting points. This meant bringing the partners together to share and discuss decision making outputs was necessary, to create dialogue on their different approaches.
Partners experienced political pressure, and needed to apply for/justify funding for site intervention/management.	A framework which provides transparency in decision making (particularly across sites) would be beneficial. The framework should encourage all sites to be considered at one time, in one place and in a consistent way.
Resourcing issues across partners	Prioritisation is a necessity.
Partners already have prioritisation approaches or frameworks in use.	If the framework does not provide additional information or "guidance", partners may revert to their current processes.
Lack of knowledge on the disease.	We are limited in what we can include in the framework by the current state of science and research.

## 4.2 HOW COULD/SHOULD THE FRAMEWORK BE USED?

The project team also sought input from partners on how the framework may be used more broadly – to understand its place in wider decision making. This related to the processes/systems that could be implemented prior to actually undertaking the site prioritisation and intervention choice exercise, and how the decision making outputs might be used after. This included:

- The process in place for deciding who should/could be part of decision making
- The policy and strategy considerations for partners ahead of prioritising sites and choosing interventions, which should inform site intervention choice
- How the various decisions of partners could be fed back into the programme, to facilitate a better understanding of what partners are doing, and whether or not there is consistency

From these discussions, the project team noted that:

### **A partnership approach had initially been agreed to....**

Partners reinforced the fact that a partnership approach was necessary – with the various agencies and Tāngata Whenua/Mana Whenua working together as partners to prevent further spread of *P.agathidicida*. It is also a key component of the Strategy.

Partners agreed that maintaining effective working relationships and collaboration amongst partners increases the effectiveness of the programme, and allows greater capture of collective expertise, and greater integration of work across the programme. The principle statement within the Partnership Charter for the Kauri Dieback Long-term Management Programme ('the Charter')<sup>4</sup> confirms this:

*"The partnership programme involves several organisations. It is recognised that each partner's obligations to its own stakeholders may influence its level of activity, ability to deliver on its responsibilities and obligations to the partnership. The partners recognise they have a responsibility to ensure their decisions regarding their own level of activity safeguard the integrity of the partnership and overall programme. The partners accept and acknowledge that each member has different accountabilities, reporting requirements and ability to contribute to the long-term management of PTA. These factors will, at all times, be respected and supported by other members."*

### **...but partners currently operate in silos**

Despite the partnership principles, most partners work on their own, with limited interaction and dialogue with other partners. Most partners have developed their own approaches to decision making (both prioritisation and intervention choice), and some

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<sup>4</sup> The Charter is currently under review (it was developed for use until 2014), however, we understand the principles remain in place.

noted the improbability of adopting a different system (e.g. due to differing drivers, or differing directives). In addition, the sharing of information, approaches and decision making was not yet systematised.

### **We need a process which encourages partnership from the start...**

Given partner feedback, the project team noted that the framework could be supported by a suggested “pre-process”, setting out steps prior to actually using the framework to prioritise/select an intervention. Within this process, partners would be encouraged to invite other agencies to be part of the decision making within their area. This would facilitate sharing of knowledge, collaboration – and potentially create opportunities for partners to offer operational support.

### **...that ensures partners consider/reflect on broader policy/strategy considerations...**

As well as encouraging partnership, it became apparent that the process should ensure that broader policy interventions and strategies are considered by partners during decision making. These were the intangible interventions that could be adopted by an agency, which would affect management of all sites. For example:

- Adopting, monitoring and enforcing standard operating procedures for staff and contractors when working in sites where kauri is present
- Adopting, monitoring and enforcing organisational policies, such as stock movement, or clean-source verification for plant and material purchases
- Implementing surveillance programmes
- Wider communication strategies

These policies needed to be considered ahead of/during the prioritisation and intervention choice exercise, and were a vital part of preventing the spread of the disease.

### **...and regularly brings the partners together after decision-making has taken place**

After undertaking decision-making, some partners noted that coming back together to share the results of the prioritisation could be an important step to “closing the loop”, and establishing whether there was consistency around site interventions. This could be as simple as a forum for discussion, or could go so far as to be the “check-point” which could lead to distribution of funding. It would also be a method of demonstrating (and genuinely applying) the partnership principles.

This would also be important in helping the programme build-up more information in relation to what works for particular types of sites.

### 4.3 THE CURRENT APPROACHES BY PARTNERS

In addition to understanding the partners and the context for using the framework, the current (different) approaches to prioritisation and intervention choice by each partner was recorded.

This was important to help set the scene for the framework; it is the starting point for partners, which has implications for how the framework may be used, and how it will suit their needs. A full description of each partner's approach is included as Appendix 4 (The Current Approach by Partners), a summarised description is in Table 3:

Table 3: Summary of the current approaches to prioritisation and intervention choice by partners.

Partner	Prioritisation	Intervention Choice
<b>Tāngata Whenua Roopū<sup>5</sup></b>	In relation to prioritisation – the attempt to prioritise one site over another was philosophically misaligned (and so, is inappropriate). This was particularly the case in light of Tāngata Whenua key drivers: Whakapapa, and the genealogical relationship to kauri and the ngahere; restoration of mauri; recognition of the interwoven co-dependent nature of all things in which humans and economics is not the dominant 'force'; protection of Taonga Tuku Iho; protecting all native forests for future generations and the importance of the elevation of nature above human.	Operationally, select interventions on Maori land (private) based on expertise and the risk profile or site characteristics of the site. However, as a partner, provide support to other partners.
<b>DOC</b>	DOC agreed "fields" for prioritisation based on issues like: site contamination; location of the tracks; whether tracks were in old kauri areas; the ecological rank; recreational and other use; current state of the track; achievability of mitigation; desire from DOC, iwi and communities to keep the track open; cost.  The key fields ultimately defined in the first round were: <ul style="list-style-type: none"> <li>• Contamination;</li> <li>• Old kauri areas;</li> <li>• DOC EMUs Ecological ranking;</li> <li>• Recreational use;</li> <li>• Cost.</li> </ul> DOC assessed priority by identifying "concern factors" within each field at sites – and gave sites a priority ranking	DOC selects interventions based on the risk profile or site characteristics of each site.

<sup>5</sup> This project team were not able to confirm these sentences with Tāngata Whenua Roopū prior to finalising the report.

	based on the number/combinations of factors. Priority ranking went from 1-10. DOC then selected against provisional costing to get to the required level of expenditure.	
<b>Auckland Council</b>	<p>At present, Auckland Council does not have a prioritisation framework/system in place, however, this is currently being developed by Council (with an emphasis on ecological significance).</p> <p>Auckland Council will prioritise the sites which have been identified in a wide-scale (5 year cycle) surveillance programme (refer notes in Appendix 4).</p>	<p>As with other partners, Auckland Council selects interventions based on the risk profile or site characteristics, particularly for areas such as the Waitakere and Hunua Ranges (where catchment areas, or management units, were identified based on water catchments, and interventions selected for those units based on the risk factors/characteristics of the site).</p> <p>The list of possible interventions for an area is usually generated by Biosecurity staff. They have the training in Kauri Dieback and are up to date on knowledge of the research (so are better placed to have an overarching view). The risk factors and intervention listed in the framework would be considered, but in a less formal manner than suggested by the framework.</p> <p>Auckland Council also monitors compliance with the various interventions it implements.</p>
<b>Waikato Regional Council</b>	<p>WRC is mandated to oversee sites which are privately owned. Territorial authorities in the region are mandated to oversee public areas.</p> <p>With regard to prioritising these sites, infected sites are prioritised (there are 5). Management of uninfected sites are anticipated to be integrated into other regional council activities, with the support of the available Tindell funding.</p>	<p>WRC staff (with operational expertise in Kauri Dieback) currently select interventions for each site, based on the risk profile/characteristics of the site. However, WRC has noted that guidance on intervention choice, particularly for private land (based on site characteristics) are sought, including consideration of how these may be enforced on private landowners.</p>
<b>Northland Regional Council</b>	<p>NRC is mandated to assist communities / landowners to help reduce the risk of kauri dieback on land which is privately / iwi owned. Territorial authorities in the region are mandated to oversee public reserves excluding public conservation land. At present, when prioritising, NRC focuses on high risk sites, using a checklist produced by operational.</p>	<p>NRC staff (with operational expertise in Kauri Dieback) currently select interventions for each site, based on the risk profile/characteristics of the site (for example potential for disease to spread further, options to contain the disease etc).</p>

When considering the current approach by partners, the project team identified the following key implications for the decision making framework (these reinforced/ added to the implications noted when discussing the partners' key drivers):

3. Partners had different approaches to prioritisation. There were differing philosophies on the need for prioritisation, or prioritisation of sites was based on different factors (and so, different "rules" were applied to the prioritisation exercise). This indicated the current approach to prioritisation appeared to be inconsistent, and meant that achieving consistency in future may be challenging. This is particularly the case considering there is no clear set of optimal solutions. For example:
  - a. Prioritisation of sites conflicts with Tāngata Whenua/Mana Whenua relationship with, and responsibility to kauri as Taonga Tuku Iho.
  - b. The Department of Conservation and Auckland Council both place most emphasis on ecological significance, while balancing/maintaining recreational access to public sites.
  - c. Northland Regional Council and Waikato Regional Council (both regional councils) are mandated to oversee private land only, while the territorial authorities have mandate over public land. Essentially, these Councils are asked to undertake a prioritisation exercise for private land<sup>6</sup>. In addition, Waikato Regional Council is directed to prioritise infected sites.
4. Interventions are selected based on various characteristics/risks associated with a site (and the interaction between these) – the choice is made by those with operational expertise. Intervention selection becomes a weighing up of all particular idiosyncrasies of the site (and the region), involving consideration of the site's context and how the risks may be interlinked/ exacerbated, before a decision is ultimately made, based on best judgment.

It became apparent that attempting to identify "themes" in the types of sites, or the types of site characteristics – linked to a choice of interventions, was not possible (at least at this stage in the programme). This indicated that the "guidance" that could be provided in the framework on intervention selection would likely be limited. This is due to the lack of understanding on what interventions work well on particular types of sites, and linking/connecting decision making on interventions to sites. This is discussed further in Section 5, in relation to the content of the framework.

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<sup>6</sup> Within the IQANZ Review of the programme (2013), helping to manage *P.agathidicida* on private land was noted as one of the greatest challenges in the next phase. It noted that support, incentives and regulation was required.

## 5 FRAMEWORK CONTENT – WHAT WENT IN?

### 5.1 INPUTS CONSIDERED PRIOR TO DEVELOPMENT

Prior to framework development, the project team looked for any information which could inform development of the framework, or be included as information within the framework. This came from:

1. An international literature review.
2. Discussions the project sponsors on the current research available about the disease – which may impact how sites could be prioritised or interventions selected.

We discuss these briefly below.

#### International literature review

The project team reviewed some literature on management plans for other plant pathogens. Any salient points, relevant to either prioritisation techniques or interventions (generally where the pathogen was a soil-dispersed *Phytophthora* species) was recorded.

The purpose of this exercise was to understand how other countries are managing spread of *Phytophthora*, in order to identify any decision making frameworks/tools which could inform New Zealand's approach. The full summary is included within the Literature Review (attached as Appendix A, which includes the reading list), however, the document and specific points of interest are set out in Table 4 below.

Table 4: A summary of the relevant points taken from literature review.

Document	The takeaway point...
<b>Victoria P. <i>cinnamomi</i> management strategy<sup>7</sup></b>	<b>Prioritisation:</b> was based on significance (with ecosystem significance being the primary "field" of consideration). Use of a "significance" test is a running theme. Here, it was about risk to an ecosystem/ biodiversity, but other social and economic considerations were at play. It noted that practicality of control could also be a factor – and cost was a consideration here.  It recommended data modelling to better understand risk. The need to get professional appraisal on whether sites are infected or not was noted. This could be a consideration within our framework. <sup>8</sup>

<sup>7</sup> Department of Sustainability and Environment (2008). Victoria's Public Land *Phytophthora cinnamomi* Management Strategy. Department of Sustainability and Environment, Melbourne.

<sup>8</sup> The Kauri Dieback Programme Planning and Intelligence work stream are currently developing criteria to help define an area 'free from PTA'. Once the criteria have been finalised they will be tested in selected areas. Areas deemed free of the disease are likely to inform the actual decision making on the ground in terms of prioritisation and selecting the most appropriate intervention.

Document	The takeaway point...
	<p><b>Intervention:</b> Using an assessment on priority (based on significance etc.), "Zones" were identified, and particular plans implemented within the Zones. In these zones, categories of interventions were identified (i.e. interventions connected to that type of Zone).</p> <p>Potentially the Zones could have different "purposes" – e.g. zones with infestation are about "response", while zones without are about "preparedness". Also, it noted that a program of regular assessment and soil testing should be developed for these important sites<sup>9</sup>.</p>
<p><b>Threat abatement plan for disease in natural ecosystems caused by <i>Phytophthora cinnamomi</i></b><sup>10</sup></p>	<p>This provided a useful approach to using risk assessment as a means of prioritisation, where "risk" is a combination of:</p> <ul style="list-style-type: none"> <li>• source of risk</li> <li>• the likelihood of occurrence</li> <li>• the magnitude of the consequences.</li> </ul> <p>It noted concerns about how to assess each of these factors- and the need to bring in qualitative/judgment based assessments. At these times, expert opinion should be obtained so subjectivity has credibility<sup>11</sup>.</p>
<p><b>Chapter 11: Risks and Priorities, Biodiversity values and threatening processes of the Gngara groundwater system</b></p>	<ul style="list-style-type: none"> <li>• The use of frameworks/tools to determine what conservation actions to invest in was encouraged – so that the benefits, constraints and uncertainties and trade-offs are explicitly stated.</li> <li>• Could be either quantitative or qualitative (e.g. mathematical optimisation tools, or multi-criteria decision analysis). Allows assessment of the worth of diverse conservation outcomes at both macro and micro scales – in order to distinguish among and integrate various goals held by stakeholders. However, it is important to specify constraints and uncertainty by being clear about what we don't know.</li> <li>• In the example provided, risk assessment was a product of likelihood and consequence (with standard semi-quantitative descriptors of likelihood and consequence). It was noted that: <ul style="list-style-type: none"> <li>○ Likelihood was defined as the likelihood an area was infested with <i>Phytophthora</i> dieback – when usually risk assessments assess the likelihood of a hazard affecting biodiversity assets in future. However, no reliable spatial information relating to the future likelihood of <i>Phytophthora</i> infection currently exists.</li> <li>○ Consequence related to the loss of biodiversity in this context.</li> </ul> </li> </ul>

<sup>9</sup> The Kauri Dieback Programme will be investigating the definition of a 'management unit' this financial year and what criteria should be used to define it. The final 'prioritisation and optimisation' framework that will be developed is likely to add value to future discussions around the definition of a 'management unit'.

<sup>10</sup> Background: Threat abatement plan for disease in natural ecosystems caused by *Phytophthora cinnamomi*, Commonwealth of Australia, 2014

<sup>11</sup> Note: A semi-quantitative model e.g. Bayesian modelling or similar may be considered as a potential research topic in the future by the Kauri Dieback Programme P&I work stream.

Document	The takeaway point...
	<ul style="list-style-type: none"> <li>o Risk was then calculated for each 100m grid cell.</li> </ul> <p>This is particularly relevant to our situation. Where risk of spread is unlikely to be considered, so much as risk of infection.</p>
<b>Chalara Management Plan (UK) and Socio-economic Framework</b>	Although risk of spread was modelled, other factors or “fields” to consider in a risk assessment to establish priorities may be relevance, like societal benefit etc.

## Current Research

Since the Kauri Dieback Programme's inception in 2008, scientific research has focused on answering the following key questions regarding the disease and the pathogen that causes it:

- What is it?
- Where is it?
- How does it spread?
- How can we control it?

Unfortunately there are still gaps in our knowledge in answering these key questions. Although research is being conducted on many fronts, currently there is 'uncertainty' around the spatial extent of the organism, how the organism behaves, vectors, critical mass, the risk of spread of an area across different landscapes and the effectiveness of current mitigation measures etc. As a result, intelligence which informs the risk profile of a site is limited in areas which have not been well studied.

This means there is limited scientific inputs and definitive “guidance” that can be included within the framework at this point in the programme, as there is no scientific basis for this<sup>12</sup>. This creates a challenging environment for partners to operate under in trying to prevent the spread of the disease and poses a risk to any operational aspect of the KDP, including development and use of this prioritisation/intervention framework.

At present, the KDP is reliant on the views of key personnel in lieu of science-based facts, which adds to the differing approaches. Feedback was obtained from key personnel during development of the framework (within and between workshops), discussed in the sections below.

<sup>12</sup> The exception to this would be best practice guidelines or standard operating procedures agreed/ratified by the Kauri Dieback Programme.

## 5.2 INPUTS INTO PRIORITISATION: RISK AND SIGNIFICANCE

When commencing development of the decision making framework, the project team were reliant on KDP partner knowledge, input and insight. All content contained within the framework came from partner feedback or documentation. For the prioritisation part of the framework, the project team sought content on 2 aspects:

- Risk: Information/input was sought on what factors to look for/consider when assessing whether a site is at risk of being infected, or of spreading the infection. Where a site had increased risk, it may then be given priority in terms of the level/degree of intervention.
- Significance: Information/input was sought on what characteristics of the site might warrant special attention (from a human-centric perspective). These were the factors which would make the site "significant" and increase the priority of the site.

During Phases 3 and 4 of the project, workshops were held with programme partners where the prioritisation part of the framework was developed. In addition, between workshops, partners offered written feedback on notes and input into the content of the risk and significance assessment within the framework.

All inputs into the framework were from partners.

## 5.3 INPUTS INTO INTERVENTION CHOICE

The same approach to obtaining content/information for aspects of the intervention selection. Information on interventions came from partners and included:

- Benefits of the intervention
- Risks associated with the intervention
- Barriers to implementation
- Effectiveness (from a subjective, partner understanding)
- Any relevant context
- Where possible, approximate initial capital cost of the intervention, and ongoing operational costs of maintenance

As with prioritisation, during the Phase 3 and 4 workshops, partners provided information on the interventions. In addition, between workshops, partners offered written feedback on notes and input into the content of the intervention choice parts of the framework. All inputs into the framework were from partners.

## Note on “guidance”

The project team note that while developing the framework, the approach/ understanding on the degree of “guidance” that should be provided in the framework evolved. Initially, the project team aimed to offer guidance on what interventions partners could select for their prioritised sites, using the following process:

1. “Profiling” the sites (essentially categorising them based on physical characteristics) to help guide later selection of interventions.
2. Setting out possible interventions and linking them to particular profiles of sites (based on physical characteristics).
3. Undertaking prioritising through a risk and significance assessment.
4. After identifying what interventions were possible on a site, and establishing priority, partners could then choose an intervention, influenced by the priority of the site. Intervention choice would then come at the end, informed by the profiling, risk assessment and prioritisation.

In this approach to guidance, we sought to identify themes/patterns in the types of sites where an intervention would be applied. These themes (based on the physical characteristics of the site) could then be used to guide selection of interventions, helping partners which wanted direction on what interventions could apply to their sites. This essentially meant partners would go through a process of profiling the sites to establish which intervention could be selected, in order to clarify the possibilities at each site. Prioritisation would answer why/when an intervention would be used.

However, during development of the framework, partners emphasised that they choose interventions by considering all idiosyncratic characteristics of a site, the region it is in, and the link with other risk factors. They select interventions based on what will suit the site – relying on various types of information. For this reason, taking the approach above (where the framework provides direction), was not possible. Instead “guidance” instead took the form of advice/information, provided to inform decision making.

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“Guidance” in the framework will be in the form of advice or information, offered to partners to inform their prioritisation processes/help them when selecting an intervention.

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## 5.4 LEVEL OF DETAIL

In addition, the level of detail for the framework was considered, and whether to include analysis of each risk and significance factor (for example, the effect each risk has on a site, and what increased/decreased the risk of that factor). Linked to this was

whether (and if so, how) to offer guidance on assessing risk (for example, offering guidance on what low, medium, high risk “looked like”). Although this was considered by the project team, given the project brief of being “non-prescriptive”, the level of detail on factors (to be included as an input into the framework) was limited to a list of what they were. It was considered that adding further information on assessing those factors would be too much detail.

This approach was endorsed by partners, who indicated that defining/directing what increased/decreased risk (when considering many different factors) was not possible. Instead it is something for partners to do, weighing up all factors, and relying on their expertise.

## 6 THE FINAL FRAMEWORK

### 6.1 WHAT IS IT MADE UP OF?

Turning to the decision making framework itself, the project team have set up the framework as an Excel spreadsheet. This is easily able to be forwarded (by email) to partners, easily accessed and easily adapted. It contains 10 colour-coded tabs in the spreadsheet – with each tab setting out one part of the framework. These tabs are:

- **Using the Framework:** A process flow-chart, explaining how the framework could be used is the 1<sup>st</sup> tab.
- **Set-up and context:** A “pre-process”, to be considered before going through the prioritisation/intervention choice exercise – aimed at encouraging collaboration across partners, and full consideration of the policy and strategy interventions that should be in place, which will affect all sites.
- **Site Profile Framework:** A tab for recording all framework outputs, including the list of sites, the major risk profile characteristics, and interventions.
- **Risk Assessment Framework:** A list of risk factors, all linked to the movement of soil which are to be considered across sites.
- **Significance Framework:** A list of significance factors, which may impact the resourcing that partners apply to a site, which should be considered across sites.
- **Prioritisation Framework:** A tab which combines the risk and significance assessment frameworks (and allows weighting to be applied by partners).
- **KDP Decision – Making Inputs:** A tab available for partners which connects them to any work from the KDP which may be helpful, including links to current Kauri Dieback Standard Operating Procedures (Best Practice Guidelines); science documents, templates and contact details for further KDP support.
- **Site Intervention Choice:** A tab setting out the list of current site interventions and the benefits, risks etc. associated with the intervention.
- **Policy Intervention Choice:** A tab setting out the list of current policy/strategy interventions that partners should have in place, or at least consider ahead of prioritising/selecting interventions, as these affect all sites.
- **Post-Framework Questions:** A post-prioritisation/intervention choice series of questions – aimed at confirming partner priorities, and encouraging partners to re-connect of their priorities.

Each tab within the framework has been printed and is included as Appendix 5.

## 6.2 HOW DOES IT WORK? EACH TAB EXPLAINED

An overview of the framework is largely explained by the process flow-chart, set out below and use of the framework (working through what partners should do for each tab) is explained.

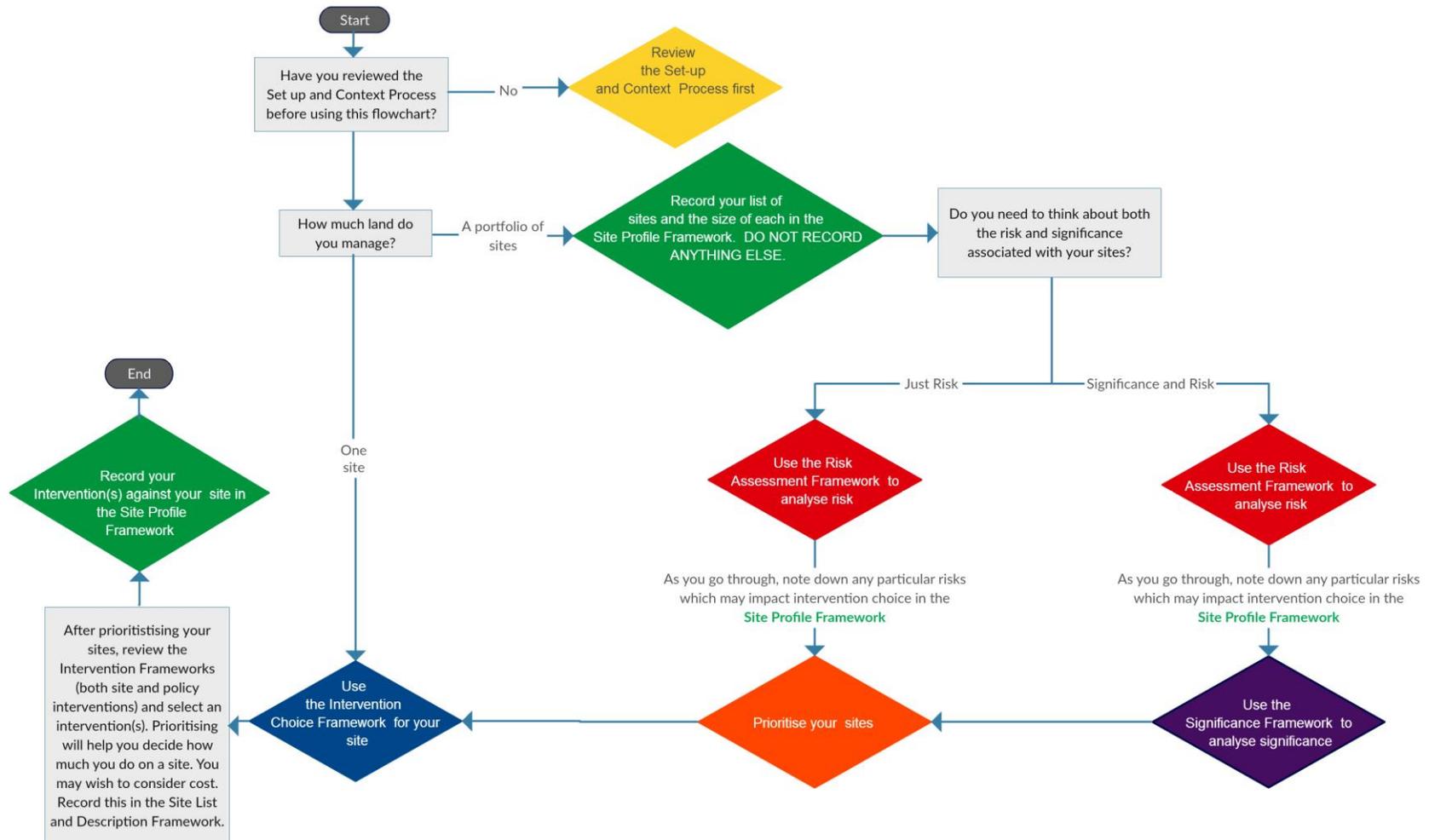


Table 5: Description of each tab within the framework.

Tab	What partners are asked to do...	Why?
<b>Using the Framework:</b>	The partners are asked to review the process for using the framework, demonstrated through the process flow-chart above. This sets out the various parts to the framework and how they work together.	This sets the scene for using the framework and shows partners the various tabs and process for using the framework. It also shows how it can be adapted to suit their needs. It will also help future staff of KDP partners to familiarise with the different parts of prioritisation/intervention choice decision making
<b>Set-up and context:</b>	Partners are asked to review the suggested “pre-process”, to be considered <u>before</u> going through the prioritisation/intervention choice exercise	This is aimed at encouraging collaboration across partners (which partners reinforced during framework development), and ensuring partners recognise the need to consider policy and strategy interventions (which should be in place) and which will affect all sites.
<b>Site list   Descriptor Framework:</b>	Within this tab, partners record their list of sites, as well as all framework outputs, including the major risk profile characteristics, and interventions.	This provides that partners with one place to collect and record any relevant outputs as they go through the framework in one place. This is the main tab used to summarise results and lists the site priority and the intervention choice made for that site.
<b>Risk Assessment Framework:</b>	<p>The first step in establishing priorities is to work through the list of risk factors, all linked to the movement of soil, for each site on the list. Here, there are 3 questions, and the factors/triggers/indicators which contribute to increasing or decreasing are listed, as reminders to partners when answering the questions.</p> <p>Partners are asked to assign a risk score from 0 – 3 for each question (0 being no risk and 3 being high risk). Partners are not directed on what constitutes low, medium or high – and can select a risk rating based on their judgement and the other factors under each question. This assessment will take place for each site and a “risk score” assigned. In the risk framework, partners can change/include weightings by adjusting the formula in the final score column.</p>	<p>This ensures partners consider all factors across all sites and provides transparency in decision making. It will also facilitate consistency within a region, as the same considerations will be given to all sites.</p> <p>It may help to justify/explain later prioritisation, as a process has been followed to identify priorities.</p>
<b>Significance Framework:</b>	<p>If partners need to prioritise based on the significance of a site (in addition to risk), the next step in establishing priorities is to work through the list of significance factors, all linked to a particular type of significance. Here, there are 4 types of significance, and the factors/triggers/indicators which contribute to increasing significance are listed for each, as reminders to partners when answering assigning a rating.</p> <p>Partners are asked to assign a significance score from 0 – 3 for each topic (0 being no significance and 3 being high significance). Partners are not directed on what constitutes low, medium or high – and can select a rating based on their judgment</p>	<p>This ensures partners consider all types of significance across all sites and provides transparency in decision making. It will also facilitate consistency within a region, as the same considerations will be given to all sites.</p> <p>It may help to justify/explain later prioritisation, as a process has been followed to identify priorities.</p>

	(and the factors under each topic). This assessment will take place for each site and a "significance score" assigned. In the significance framework, partners can change/include weightings by adjusting the formula in the final score column.	
<b>Prioritisation Framework:</b>	After undertaking risk and significance assessment, this tab which combines the risk and significance assessment frameworks, and gives an overall priority score. Within this tab, a weighting can be applied by partners if necessary, to weight risk or significance more highly. Here partners can order their list of sites by priority (using the sort function in Excel).	This allows priority to be assigned based on both risk and significance.
<b>KDP Decision – Making Inputs:</b>	Once priorities are assigned, but before selecting interventions, partners can check-in on any existing templates/approaches created as part of the programme. This includes (for example) the KDP Operational work stream's approach to intervention choice, as well as links to templates and contact details for KDP support.	This is the repository of links to current information which could be useful/helpful to partners. This tab was inserted for partners to be able to easily access the work of the KDP, which will feed into partners' operations.
<b>Site Intervention Choice:</b>	After prioritising, partners can consider the information within this tab, which sets out the list of current potential site interventions, and the relevant information on each (e.g. benefits, risks etc. associated with the intervention). Having gone through the risk assessment, any particular characteristics of the site which could be relevant to intervention choice should have been noted in the Site list   Descriptor tab, and an intervention (or interventions) can be selected, depending on where on the list of priorities the site sits.	This tab is meant to guide partners on intervention choice by providing the relevant information which could help with/inform intervention selection. Although it is not prescriptive, it provides partners with important information on each intervention.
<b>Policy Intervention Choice:</b>	When reviewing the pre-process, partners are asked to first consider the policy interventions that should be in place, which will apply to the partner as an organisation and affect all sites. This tab sets out the list of current policy/strategy interventions that should be considered ahead of prioritising/selecting interventions.	As above, the project team sought to reinforce the fact that broader policies should be in place for all partners and that these should be monitored and enforced. The team recognised that these were not tangible site interventions, but still had the ability to contribute to preventing the spread of the disease by shaping how staff/contractors/ acted on sites, and how other risk related to other decisions (like where to purchase nursery plants from) could be mitigated.
<b>Post-Framework Questions:</b>	Lastly, a series of questions are posed, post-prioritisation/intervention choice. These are for consideration by partners, and do not need to be recorded or followed – it is more a reminder.	Lastly, in response to partner feedback on aspects of decision making that should follow the exercise, this list of questions was set out to help partners confirm they have the correct priorities, and encourage partners to re-connect with other partners and the KDP about the results of their prioritisation and intervention choice exercise.

## 6.3 BENEFITS OF THIS FRAMEWORK

### Benefits achieved during development of the framework

During development, partners were brought together to discuss: their different approaches; what factors were part of their decision making; how factors were considered together and weighted and their respective points of view.

This was beneficial to the programme, as it allowed knowledge sharing and transfer amongst partners, and reinforced partner collaboration. The project provided a valuable platform for opening up dialogue and discussion – particularly important for the management of the disease, where partners are reliant on the experiences and insights of partners.

### Benefits from the framework

Despite the challenges created by the current approach to prioritisation of partners, and the level of guidance available, the framework itself offers the following benefits:

1. It captures the current information available on decision making areas, and provides a national view and platform for sharing best practise/ information. This includes:
  - a. The risk factors to be considered when assessing risk (connected to how they increase the risk of soil movement).
  - b. The list of significance factors to consider when assessing which sites may require more resourcing than others.
  - c. Information on each of the site interventions, which could be relevant to the selection of interventions.
  - d. Information/advice made available by the KDP programme.

It essentially serves as a repository of current information, amalgamating the various approaches of partners to risk assessment, significance assessment and intervention choice.

2. It provides a base or starting point, which can be updated/adapted – and expanded in future. It is meant to be a dynamic document, which will change as further research and science is available on risks and the effectiveness of interventions.
3. It provides partners with a template which can be adapted, adjusted and tailored according to their needs, and sets all sites out in one place – and in requires partners to consider the same factors for all sites. This brings about transparency for

partners in decision making – and may help to justify/explain why some sites are prioritised over others.

4. It includes reference to aspects of decision making that are not (strictly speaking) part of prioritisation and intervention choice, but which are associated and inform the process. This includes the pre-process, which if implemented, should lead to greater collaboration and information/expertise sharing and input on decision making

#### 6.4 WHAT DO PARTNERS THINK? LEVEL OF BUY-IN

After workshop 2, we circulated an updated version of the framework for review by the partners. We also provided them with an opportunity to provide feedback via a Survey Monkey survey.

Partner feedback was limited to that set out below in Table 6. We set out how feedback was provided and a summary of what general feedback.

Table 6: Final partner feedback.

	Type	General comments
1	Email and comments on framework	<ul style="list-style-type: none"> <li>• Positive feedback – could see the value in the process and the level of detail.</li> <li>• Would like to see more emphasis on ecological significance.</li> <li>• Would like to see more emphasis on the broader policy interventions.</li> </ul>
2	Email and comments on notes	<ul style="list-style-type: none"> <li>• Would like guidance on what constitutes a “site”.</li> <li>• Concerned about how many factors/ considerations there are in the framework – believes just the main ‘big ticket’ risks should be considered when prioritising.</li> <li>• Believes the KDP could endorse some interventions as best practise, and that it can still provide national guidance for what is a national biosecurity response - it would show that there is a methodology behind how the KDP is currently responding.</li> <li>• Concerned that the framework still allows subjective partner assessment which would undermine a national biosecurity response.</li> <li>• Endorses an approach which sees the partners come back together to compare the results of the prioritisation exercise.</li> </ul>
3	Email	<ul style="list-style-type: none"> <li>• Generally positive feedback on the approach and level of detail – particularly the site-specific features of an area.</li> <li>• Agrees with the “none, low, medium, high” approach to risk and significance.</li> </ul>
4	Email, comments on framework and Survey Monkey	<ul style="list-style-type: none"> <li>• Would like to see more emphasis on ecological significance.</li> <li>• Shona provided more detail for this assessment, and encouraged us to include an assessment of representativeness after prioritising.</li> </ul>

5	Telephone	<ul style="list-style-type: none"> <li>Reminded the KDP that the Regional Councils only have mandate on private land.</li> <li>WRC has clear directives about prioritisation already.</li> <li>Would like to see best practise guidelines on what interventions to use.</li> </ul>
6	Email	<ul style="list-style-type: none"> <li>Concerned about the use of 30m when discussing actions close to kauri, instead of the distance being 3 times the diameter of the kauri drip line.</li> <li>Wanted more of an explanation on how risk is assessed.</li> <li>Concerned about the KDP decision making inputs – considers this needs careful review.</li> </ul>
7	Survey Monkey	<ul style="list-style-type: none"> <li>Considers the approach to prioritising and selecting interventions is appropriate.</li> <li>Correct amount of detail/guidance.</li> <li>Maybe able to adapt the framework when prioritising and selecting an intervention.</li> <li>Does not consider the pre-process is helpful.</li> </ul>
8	Survey Monkey	<ul style="list-style-type: none"> <li>Considers it is good to have a universal protocol and have all information before decisions are made.</li> <li>May be able to be adapted.</li> <li>Does not think the framework will be helpful to NRC when prioritising and selecting an intervention.</li> </ul>
9	Survey Monkey	<ul style="list-style-type: none"> <li>Does not think the approach to prioritising is appropriate (refer Tāngata Whenua Roopū philosophy on this).</li> <li>May be able to adapt the framework.</li> <li>May be helpful when prioritising and selecting an intervention.</li> <li>Does not consider the pre-process is helpful.</li> </ul>

Assessing the buy-in of partners is difficult given the limited feedback. However, from the comments received the feedback has been variable. Some partners have confirmed the approach is suitable, containing the right level of detail and range of factors. Other partners have indicated that additional direction/guidance was sought from the framework.

Partner buy-in may be better assessed after the framework is implemented, and the results of the exercise compared and contrasted with other partners. This will help in assessing whether a national response is being taken.

## 7 LOOKING TO THE FUTURE - RECOMMENDATIONS

### 7.1 RECOMMENDATIONS

Given the context and content of the framework, and the partner feedback received during development of the framework, the project team makes the following recommendations:

1. Adopt and circulate the framework for testing. The framework should provide partners with a reference point for consideration when undertaking prioritisation and intervention choice.

Partners can adapt the framework, or borrow from it, as they see fit. This may involve partners deciding how to apply rankings within the framework (i.e. decide what “low, medium, high” means for risk and significance), for their sites. These criteria/rules would be applied within the framework by the partner, across each of their sites.

2. Allow the framework to be tested by partners, by applying the framework to their sites. The project team can gather early in 2016 to discuss:
  - a. Use of the framework (what worked well, what did not work well).
  - b. Potential improvements.
  - c. Compare and contrast how partners are prioritising sites and selecting interventions.

An example timeline might look like:

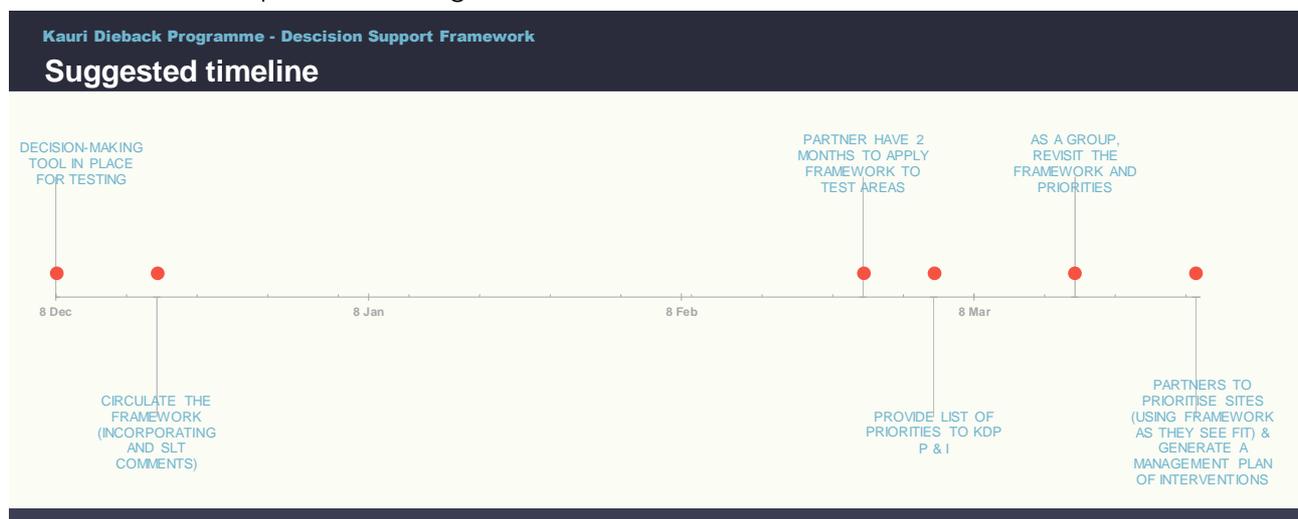


Figure 3: An example timeline for testing, reviewing and adjusting the prioritisation framework.

Any further changes to the framework can be incorporated (and the framework circulated).

3. Schedule regular, ongoing partner communication, follow-up and input meetings (e.g. check-in forums). At these, partners can share how prioritisation is working, and what is happening with site interventions/operations more generally. Include any partners who could be important to have here (for example the territorial authorities).

This would include any assessment of whether changes have been made to the way partners are undertaking prioritisation/intervention choice.

4. Regular re-consideration of the framework, to add to/change any risk or significance factors, or (when research becomes available), amend the interventions framework to include information on effectiveness or application.

For example, it is understood that Auckland Council is currently undertaking work on ecological significance (to better understand this). The results of this work could be included in the framework.

5. Continue to build on the framework, adding in any further work/materials/resources which become available through the kauri dieback programme, for example:
  - a. Best Practise Guidelines – agreed and ratified by partners.
  - b. The results of the regulatory assessment.
  - c. Guidance on a management unit/catchment area.
  - d. Capture/share information.