



Cultural monitoring tools: A mana whenua narrative

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EXECUTIVE SUMMARY

The following report reflects the narrative captured whilst developing and trialing a cultural monitoring survey tool for the Ngā Rākau Taketake theme: Control Protect, Cure; Cultural monitoring tools. The development of the tool process and the feedback from the field trials with 6 hapū within the 3 case study regions is summarised here. This report documents the development process which was conducted in 2021 to 2023.

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Ngā mihi atu ki a koutou katoa.

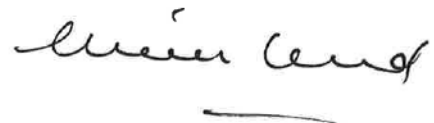
This report has been reviewed by the Te Whakahononga Tangata kokiri and kaitiaki mana whenua of the Ngā Rākau Taketake project.

This report has been reviewed and signed off by:

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Date:

12 March 2024

12 March 2024

INTRODUCTION

Ngā Rākau Taketake – RA3B Control Protect Cure: Cultural monitoring tools.

As part of the Ngā Rākau Taketake research program stream Research Area 3B – Theme 5 Control, Protect, Cure, the aims were a cultural monitoring tool. Firstly, a review was done on all cultural monitoring tools that have been created and information that had been published on, in New Zealand (Hetet et al., 2021). Informed by the review, and existing mātauranga based monitoring tools including Kauri Cultural Health Indicators (Chetham & Shortland, 2013) from the Tāngata Whenua Rōpu - Kauri Dieback Programme. A cultural monitoring tool was then developed based on these models. A team of mana whenua, Māori researchers and Te Whakahononga Māori Co-lead rōpu, from the Ngā Rākau Taketake project discussed how these models could be adapted and customized to create a tool that could respond to kauri die back (*Phytophthora agathidicida*) and myrtle rust (*Austropuccinia psidii*) in the biosecurity monitoring space. On creation of the tool and initial trials it was then transferred into the digital format of which is Survey123. In Survey123 the data will provide mapping visualisation of the cultural metrics to build cultural socio - ecological data on the Biodiversity Management Units (BMU) for each mana whenua that is participating in the Ngā Rākau Taketake research projects. This report is a mana whenua narrative from those who participated in the creation of this tool and their responses to the tool in the first stage of trials as a paper field sheet template, and then the digital tablet. This was an addition tool in the suite of tools including the biological survey, kauri die back and myrtle rust surveys, which were developed under the other research streams of the larger Ngā Rākau Taketake program. We report here on the cultural monitoring tool and its development.



Kaimahi trialling the framework from the two case study groups: Tauranga moana and Te Tai Tokerau 2022



METHODOLOGY

Based on the overall Te Whakahononga consolidation process, mana whenua who had opted to participate in the Ngā Rākau Taketake program were invited to select relevant research streams of interest. They were then written into the development plan for these research streams. For this research stream hapu kaimahi from Te Uri o Hau, Patuharakeke, Ngāti Rua, Ngāti Rehia (Te Tai Tokerau), Ngāti Te Wai (Tauranga Moana) and Rangitane (Manawatu) signaled their interest in participating in the development of a cultural monitoring tool to sit alongside the science-based tools on kauri die back and myrtle rust that were developed within the wider Ngā Rākau Taketake project.

As a baseline format we used the Ngāti Rangī Ngahere monitoring tool (Reihana et al., 2023), to create the foundation of the tool. A revised edition of this field ngahere form into a more generic te reo (removing the Ngāti Rangī specific spelling and terms) was drafted up for this monitoring tool. A literature review was conducted by Kahu environmental (Hetet et al., 2021) and the relevant aspects from this review were incorporated in the foundational tool document. This can be seen in Appendix 1 of the tool. This tool was then submitted to the projects Māori kahui (governing board) for feedback and edits. A draft field sheet was then taken out to rōpū (group) kaimahi for feedback, editing and trialing.

Rōpū who had volunteered to participate in the development of the tool were then invited to day wananga in their respective regional areas to test and discuss the relevance of our initial draft tool. These regional areas were Te Tai Tokerau, Tauranga moana and Manawatu, any rōpū who were within each of these regions were invited to these trial wananga and gave their feedback on this tool.

At each wananga, a base camp was established where all kaimahi (rangers, workers) would gather for eating and project briefing. The hau kainga (local tribal hosts) would do an informal mihi whakatau (less formal welcome), and ice breaker for all the manuhiri (visitors) kaimahi to introduce themselves and bond (or get to know) the other kaimahi from different areas. Following this whakatau, a karakia (prayer or incantation) was done and a meal ensued to whakanoa (remove the tapu - scaredness of the visitors) of the manuhiri kaimahi from other areas.

After this process a brief on the kaupapa (principles) of the hui was discussed and an outline of the program for the day was shared.

Each kaimahi was issued with the field sheet on a clipboard. Before entering the ngahere. Another karakia to ask favor over us for the proposed work ahead within the forest realm was conducted. Based on the local kamahi knowledge, we then tramped into their local ngahere and stopped at identified points within each location to discuss the understanding and context to which each question was promoting responses and garnering assessments. The kaimahi after a period of discussion on the questions then answered the field sheet questions and ranked their thoughts on the health of the ngahere. Additional information and observations were also recorded that they thought was relevant for the feedback sessions. On completion of the ngahere tramp the kaimahi returned to our base camp area where further discussion and feedback was collected.

Each kaimahi was then provided with a survey form so that feedback could be collected in a written form for later analysis and review.

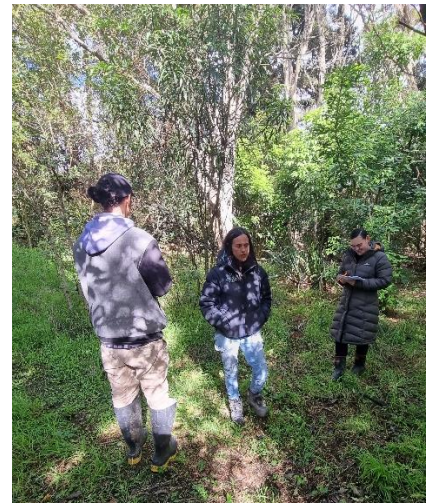
Survey forms asked about the essential relevance of information and the ease of use of this as a tool.

On completion of the feedback survey a poroporoaki (farewell acknowledgement) was then held and all kaimahi returned home.

On completion of the paper trials a digital model was created.

Digital trials were then done, these were based on the active kaimahi who had been given tablets to trial and who had actively been recording data with the suite of surveys that had now been developed and distributed to rōpū.

Digital trials were held at each rōpū, and I would go to their offices to discuss any issues around the trials, technology glitches and the digital tablets. These were one on one trials based on those rōpū who had been using the tablets.



Kaimahi training of Rangitane in Makirikiri reserve and Mangatoro reserve

TOOL DEVELOPMENT OUTLINE

To measure the state of health of the ngāhere, attributes were identified as governing areas of health of the ngāhere. These areas were zonation's known as cultural themes, which captured the core wellbeing of the ngāhere as identified by Ngāti Rangī and extended on here by the participating mana whenua kaimahi. A mātauranga design process was undertaken, this is shown in Figure 1.

The cultural themes identified in this model were Ngāhere – nature of the forest, Rongoā (medicinal), Manu (birds), Wai (the two states of wai in this tool, were allocated as 1) mauri of wai in the ngāhere and 2) mauri of the puna, awa within the ngāhere) and Tāngata, the metrics then measured the observed interactions between these cultural indicators. These indicators had cultural descriptions to measure the state of health from wellness to unwellness (Nui to Aue) or the presence or absence of a measure. A table with these indicators, metrics and ranking measures can be found in Appendix 1.

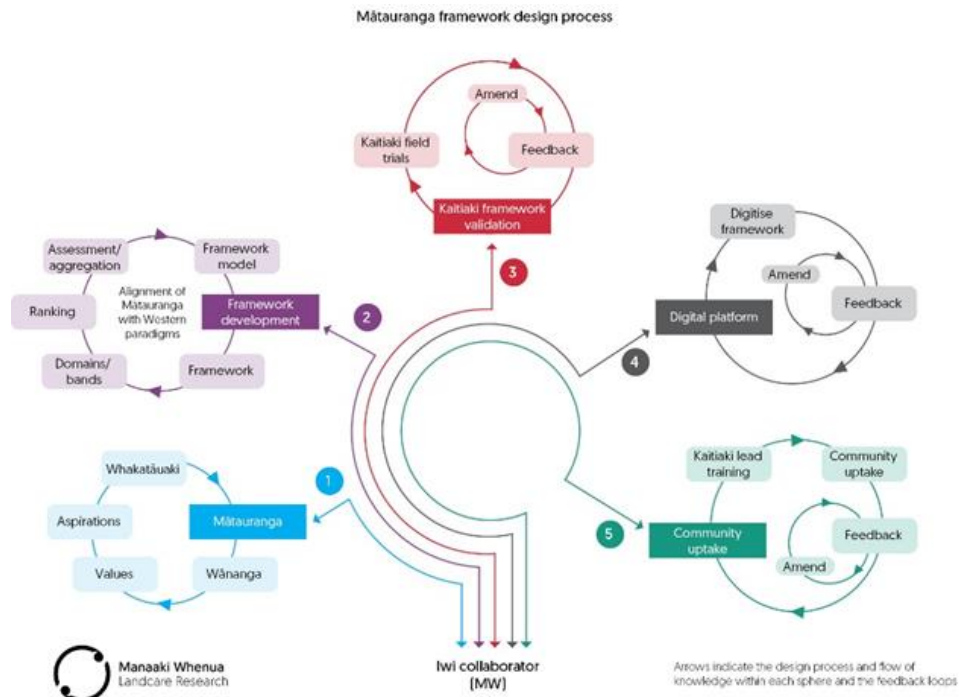


Figure 1: Mātauranga tool design process: (Ens et al., 2021)

With the consolidating of all the monitoring tools (kauri die back, myrtle rust specific and other ecological surveying of aspects) in the wider project, this was an addition to the Survey123 platform tablets.

ADDITIONS AND MODIFICATIONS FROM ORIGINAL NGĀTI RANGI TOOL.

An initial observational page opens the tool to connect kaimahi to the place and open their awareness of the area they are working within. So visual observations of tohu of the Rangi, whenua, wai and tangata. Observational indicators of the physical realms prompt the kaimahi to record the overall natural indicators that are present on arrival such as wind, sun, species, humans and the connections or behavior they are seeing at that point in time. This can capture and correlate information such as floral blooms, algal blooms etc. at times of the year which give other natural world cues to the state of the environment.

One key addition of this framework model is the two wai mauri measures on the forest itself and the water bodies. Each capturing the different vitality of the mauri of each aspect within the ngahere. For the mauri vitality within the forest itself we measured it by mauri ora, mauri kaha, mauri oho and mauri noho (Q 17 & 18). For the water bodies presence and absence of taonga species were the limiting factor (Q19) to which the habitat and its state could determine the viability of their survival within this site or location (Q20, 21,). These were measured by nui, pai, ahau pai, and iti. Then kaimahi are asked to observe the nature of mauri within these locations through a full sensory observation again measured by mauri ora, to mauri noho. Described by the state of their senses whether they were invigorated, strong, awakened, or inactive.

Next the connection of kaimahi to the awa is considered and measured again by a metric of mauri ora to mauri noho. This metric considered access as part of their connection to respective sites, to enact a regular connection to place (Q22). Then how through their connection they perceived their oranga which is measured from nui to iti (Q23).

Another area of difference to capture mātauranga specifically on kauri die back or myrtle rust was the area introduced within the general forest area called Mauiuitanga – these metrics measured observation of disease and changes in the trees or habitats, which indicate disease including invasive mammals and browsing evidence (Q 6-10). These were measured by ‘nui’ to ‘aue’. Descriptive metrics on the decline of trees from kauri die back are detailed in (Q7) where the various stages of dying have been observed from Te Uri o Hau in their kaitiakitanga of the kauri. These descriptors are most beneficial to the other rōpū who have not had the experiences yet such as Ngāti Te Wai, who now have Kauri die back in their ngahere.

MANA WHENUA REFLECTIONS

Paper template

Feedback from the trial sessions by kaimahi from the two regional sessions was very positive, overall, we received 55% positive feedback in the surveyed forms, where the most frequent response was the tool covered a comprehensive cultural observation of the health of the forest from a Te Ao Māori point of view. There was 12% negative feedback and 9% recommending improvements.

We did an NViVO 12 analysis on the feedback using word frequency with an exact word match, which showed that a logical progression through the tool indicated that participants thought the tool gave a deeper exploration of their ngahere.

The subset of text, which was most frequent in the feedback, provided a word cluster of aspects, good, life, covered and questions, Figure 2.

These cluster group were words that featured frequently in the feedback and highlight the positive reaction received from the trial groups.

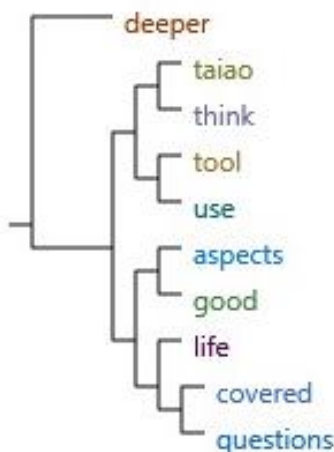


Figure 2: Exact word match frequency analysis tree



Figure 3: Generalized word association, word cloud.

A second analysis on the generalization of words associations within the text revealed Change as the key word used, Figure 3.

Overall, a clear positive response to the tool, what it was required to achieve and how the kaimahi felt about it as a field sheet tool.

Digital format responses:

From the digital tool feedback, 67% of the kaimahi surveyed had a positive response, a marked increase on the positive response from the field sheet tool. Similarly, 13% of users found it hard to use, which was consistent with the field sheet survey of the tool. While 19% remained neutral these included people who hadn't really used the app for various reasons. Kaimahi who did the digital survey, ($n=17$), of the respondents, 70% who identified as male and 30% identified as female participants.

Word cloud analysis

For how hard the tool was to use, its positive and negative feedback the following word clouds describe the overall frequency the kaimahi used these words in their feedback. For question 3, How easy was the tool to use? Kaimahi had a ranking system from 1 hard, 2 a little bit hard, 3 – neutral, 4 quite easy and 5 very easy figure 4. In figure 5, we see the frequency of words used in the positive feedback from kaimahi and the negative feedback (figure 6).



Figure 4: Word cloud on how the tool ranked from hard to easy Question 3 from survey.



Figure 5: Positive feedback results

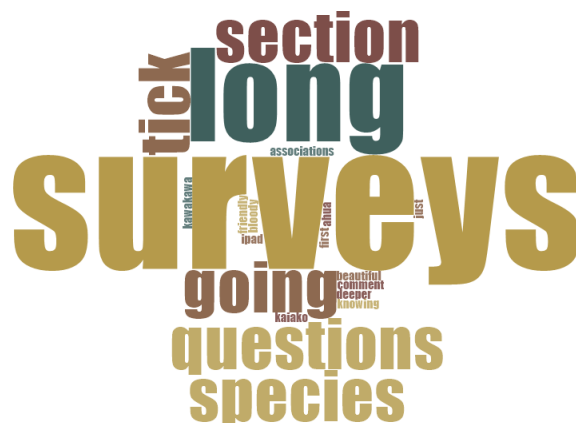


Figure 6: Negative feedback results

Overall, the survey was considered much easier to use in a digital format. General comments on the content also support that kaimahi, thought the survey was comprehensive in recording Māori ecological data on the wellness of the ngahere. Feedback indicates that the questions are comprehensive, and coverage is thorough.

Valuable insights from the feedback were:

- 1) The suite of surveys may be too much, clarifying the difference between the different kinds would support kaimahi to not feel overwhelmed by the overall tool.
- 2) Back resourcing kaimahi e.g., id guides for rākau, shrubs, ground cover, weeds birds etc specific to areas.
- 3) Maramataka add on, to track seasonal patterns.
- 4) Info quick guide on tool, e.g.: must reload new link for updated version etc, data held on tablet, must be manually submitted when in range etc.
- 5) Understanding the natural changes, death of a rākau as opposed to the incursion changes of the rākau, manu, ngāngara and ngahere etc.
- 6) Taking time and slowing down to reconnect with the Ngahere to reclaim the connections that our tupuna had.

CONSIDERATIONS

As a starting point the developed mātauranga based tools for forest health monitoring, gave the participating hapū groups a solid foundation. This tool is customisable and can easily incorporate each hapū nuance and dialectical variations. This is not by any means a final product and future iterations can be expected.

While forest monitoring in general is an evolving at a rapid pace, to do it from a Te Ao Māori world view is also a new and emergent process. Therefore, there is much work that will need to be done on these in the future, dependent on what each hapū are requiring from this tool.

With the aggregation and score metrics these also will need further robust testing, in order to quantify if this tool is collecting the data required.

We also need to get further feedback on the specific kauri die back and myrtle rust measures. However, as this tool is paired with Neoclassical tools specific to myrtle rust and kauri die back, is this a pressing need for this tool to replicate these measures?

If there is something culturally specific around these pathogens that is not being picked up in the other tools, then this tool provides the space to capture it in here.

Technical challenges, for example the manual data entry on the device once kaimahi have returned from the field, is cumbersome and can be a leaking bottle neck where data and information could get be lost. Future iterations could benefit from software or design changes which can incorporate in-situ data processing, which is held on the device, then could automatically upload once within internet range.

Back resourcing and information guides may also be an offline web page or resource that can be accessed by kaimahi, to support their field knowledge and build their knowledge capacity, as well as being a reference base for them.

An additional kauri die back metric was designed by Te Uri o Hau, this was very valuable in capturing the observed decline over time of kauri, infected by kauri die back, there would be value in similar metrics for myrtle rust from whanau observation, these have not been identified yet.

CONCLUSION

In conclusion this tool was developed to respond to the urgent need of mana whenua to have a Te Ao Māori based tool to capture their world view and data, to formulate and articulate their response to kauri die back and myrtle rust. This, as with mātauranga will be a living tool, which is in its early inception and still has some way to still go, however it is a good foundation. Overall, the hapū organisations we trialed this with repeatedly claimed that it was comprehensive, captured a good overall view of forest health and gave measurable metrics with which to share with external parties. In this context we have achieved the outcome to provide a tool with which to measure forest health from a Te Ao Māori world view. It was also quite positively received and used in the paper format.

The digital format trials echoed the same general comments from the paper trial. The ease of its use as a tool. Some technical difficulties were identified from the trials, including general installation and use of updated versions, manual submission on return to places with coverage and requiring a GPS to accurately locate positions. A small e.g., a 1-pager 'how to guide' would be valuable to kaimahi as they familiarize themselves with the tablet and tool.

Other resources which would be valuable are id guides for tree's, birds, insect, fungi etc. to support kaimahi connection and literacy within their local ngahere places.

Fundamentally, the data collection and training of this collection will be very valuable to hapu who can start to get seasonal information and general knowledge on their forest sites and general observations of myrtle rust and kauri die back.

The sharing of knowledge between hapu cannot be underestimated as hapu without the disease are now being affected by them, this has been the most valuable knowledge and lessons on this project.

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APPENDIX

Table 1. Key cultural themes, their associated indicators and ordinal scores and descriptions used to assess forest health by Ngā Rākau Taketake kaimahi experts from the Northland region and central of the North Island, New Zealand. Blue highlighted areas are specifically designed questions from within this study.

Cultural themes	Cultural indicators	Ordinal scores Māori	Ordinal scores English	Ordinal score descriptions
Ngahere (Ahua o te Ngahere: the nature of the forest)	1 - Is the Ngahere floor flourishing?	4 Nui	Abundant	(Look around, what can you see?) The Ngahere floor is covered in dense leaf litter and debris, ferns, fungi and moss are abundant, the small shrubs and seedlings are diverse and abundant.
		3 Pai	Good	The Ngahere floor is covered in dense leaf litter and debris, ferns, fungi and moss are present but less abundant, small shrubs and seedlings are not as dense nor diverse.
		2 Ahua Pai	Ok	The Ngahere floor is covered with leaf litter and debris, fungi and moss are scarce, small shrubs and seedlings are spread out and scarce.
		1 Iti	Small or not significant	The Ngahere floor is limited with leaf litter and debris, no sign of fungi or moss, any small shrubs and seedlings are dominated by 2 - 4 species.
		0 Aue	Not great	The Ngahere floor is severely limited with leaf litter and debris, no sign of ferns or juvenile trees. It is dry and feels impoverished.
	2 - Are there canopy layers present and thriving?	4 Nui	Abundant	Are the tree's foliage flourishing and thick, are there rākau supporting other plants? The Ngahere canopy layers are clearly visible, taonga species (manu) are presently thriving and abundant.
		3 Pai	Good	The Ngahere canopy layers are somewhat present and taonga species are present.
		2 Ahua Pai	Ok	The Ngahere canopy layers are few and limited with, taonga species are present but limited in numbers.
		1 Iti	Small or not significant	The Ngahere canopy layers are thin and letting light and wind through, taonga species are hardly present.
		0 Aue	Not great	The Ngahere canopy layer is severely limited with no food for taonga species.

	<p>3 – Do rākau have access to light to grow?</p> <p>If yes... What species of tree is it/are they? List them.</p>	<p>1 Ae</p> <p>0 Kahore</p>	<p>Yes</p> <p>No</p>	
	<p>4 - Are there significant trees present?</p> <p>List them. Why are they significant?</p>	<p>1 Ae</p> <p>0 Kahore</p>	<p>Yes</p> <p>No</p>	
	<p>5 – What kind of diversity can you see?</p>	<p>4 Nui</p> <p>3 Pai</p> <p>2 Ahua Pai</p> <p>1 Iti</p> <p>0 Aue</p>	<p>Abundant</p> <p>Good</p> <p>Ok</p> <p>Small or not significant</p> <p>Not great</p>	<p>There is a visible abundant variety of flora, 50 or more trees and plants, many layers in the Ngahere from floor to canopy.</p> <p>There is a visible variety of flora, 35 -50 or more trees and plants.</p> <p>There is a variety of flora, 15 -35 or more trees and plants.</p> <p>There is very little diversity, less than 15 plants.</p> <p>There are severely limited diversity less than 5 plants.</p>
Mauuitanga	<p>6 – Are any trees displaying symptoms of disease?</p>	<p>0 Ae</p> <p>1 Kahore</p>	<p>Yes</p> <p>No</p>	
	<p>7 – What extent of hake (sores or pus-like lesions on the rākau) are visible?</p>	<p>4 Pai ana</p> <p>3 Pai</p> <p>2 Hanaga pai</p> <p>1 Kore pai</p>	<p>Health is in a very good state</p> <p>Health is in a good state</p> <p>Health is building.</p> <p>Health is declining.</p>	<p>Changes relating to the disease such as early signs of kauri die back or myrtle rust in the immediate area or surrounding trees.</p> <p>Healthy rākau, no signs of canopy thinning, no signs of bleeding, hake or pus-like sores or lesions.</p> <p>Canopy/overall tree I green in color, no signs of hake/sores/lesion possibly early indications of unwellness in tree.</p> <p>Canopy has green coloring, but somewhat thin, showing signs of hake forming, starting to bleed and showing early signs of pus-like sores/lesions on trunk.</p> <p>Canopy is very thinned out, color is brown to yellow, brittle and becoming lifeless, tree is visibly bleeding, has hake and pus-like sores/lesions on trunk.</p>

		0 Aue	Health is latent.	Rākau is kumite, canopy is nonexistent, clear coloring to the trunk, brittle and lifeless. NOTE: need to distinguish between natural death and disease.
	8 – What changes can you observe in the trees?	4 Nui 3 Pai 2 Ahua Pai 1 Iti 0 Aue	Abundant Good Ok Small or not significant Not great	Other changes over time you have been monitoring such as signs of changes in litter composition, insects, animals, birds, flowers the presence and absence of these. The trees remain very strong and diverse with very minimal impact from habitat disruption and are presently thriving and abundant. The trees are strong and less diverse with some indications of habitat disruption and limited key species are present. The trees are limited and have visible disease, foliage is showing signs of infection and key species are minimal. The trees are limited and have significant disease, foliage is showing signs of infection and key species are less. The trees are limited and have significant disease is visible, foliage is infected and key species are absent.
	9 – Is there evidence of animal browsing?	1 Ae 0 Kahore	Yes No	
	10 – Do taonga have a suitable habitat to thrive at this site?	4 Nui 3 Pai 2 Ahua Pai 1 Iti 0 Aue	Abundant Good Ok Small or not significant Not great	The habitat capacity is very strong and diverse with very minimal impact from pest species, taonga species are presently thriving an abundant. The habitat capacity is strong but less diverse with some impact from pest species, very few taonga species are present. The habitat capacity is limited with moderate to heavy impacts by pest species, taonga species are presently thriving an abundant The habitat capacity is limited with significant impact from pest species, taonga species numbers less e.g. than 3 of manu. The habitat capacity is severely limited with significant impacts from pests and exotics, no taonga species are present.
Rongoā (medicinal)	11 – Is this a known site for rōngoa? List	1 Ae 0 Kahore	Yes No	

plants)	12 – Are there weeds present?	0 Ae 1 Kahore	Yes No	
	13 – Does their presence change the feel/smell/look of the place?	0 Ae 1 Kahore	Yes No	
Manu (birds)	14 – Are taonga species present?	1 Ae 0 Kahore	Yes No	
	15 – Are insects present or can you see any evidence of them in this place? eg. browsing, nests etc.	1 Ae 0 Kahore	Yes No	
	16 – What manu and/or insects do you hear? List			
	17 – Is the voice of the ngahere strong and full of life?	4 Nui 3 Pai 2 Ahua Pai 1 Iti 0 Aue	Abundant Good Ok Small or not significant Not great	The forest is flourishing with diversity and taonga species (manu) are abundant and thriving. The forest is intact with minimal impact, taonga species are present. The forest has limited diversity with obvious impact from pest species, taonga are present but not thriving nor abundant. The forest has limited diversity with significant impact from pest species, taonga species are scarce. The forest is severely limited with significant impact from pest species, no taonga species are present.
Wai (Water) (its presence within the forest to maintain the wellness of the	18 – How would you consider the mauri of the site?	3 Mauri ora	Healthy life essence	Using your observational senses how does the water (i.e. dampness) of the forest feel or smell, it's presence or absence in the forest. The mauri is flourishing and key taonga species are abundant (manu (birds)/rākau (trees) etc.)
		2 Mauri kaha	Ascending life essence	The mauri is expanding and key taonga species are present.

forest)		1 Mauri oho	Awakening life essence	The mauri is improving and key taonga species are scarce.
		0 Mauri noho	Revealing or uncovering life essence	The mauri is inactive and no key taonga species are present.
	19 – What is the rongo of the wai in the ngahere?	3 Mauri ora	Healthy life essence	Using your observational senses how does the water (i.e. dampness) of the forest feel or smell, its presence of absence in the forest? The mauri (life force) of the wai (water) is flourishing the forest smells and feels damp and key taonga species are abundant.
		2 Mauri kaha	Ascending life essence	The mauri of wai is expanding, the forest smells and key taonga species are present.
		1 Mauri oho	Awakening life essence	The mauri of wai is improving, the forest has no damp smell and key taonga species are scarce.
0 Mauri noho		Revealing or uncovering life essence	The mauri of wai is inactive, the forest feels and smells dry and key taonga species are absent.	
For water bodies e.g. away/rivers, lakes puna/streams within the ngahere				
20 – Is it safe to eat taonga species from this site?	1 Ae	Yes		
	0 Kahore	No		
21 – Do taonga species have a suitable habitat?	4 Nui	Abundant	Using your observational sense for awa, rivers lakes or puna/streams, how is the health of the water body I this forest, it feels, smell, or its presence? Is the habitat capacity very strong, is there minimal impact from invasive pest species and land use change?	
	3 Pai	Good	Is the habitat capacity strong, is there some impact from invasive pest species and land use changes?	
	2 Ahua Pai	Ok	Is the habitat capacity limited, is there significant impact from invasive pest species and land use changes?	
	1 Iti	Small or not significant	Is the habitat capacity severely limited, is there significant impact from invasive pest species and land use changes?	
22 – Are the senses awakened at this site?				Are your senses awakened by the awa and how does it contribute to the forest feel, smell or presence?
	4 Mauri ora	Healthy life essence	Your senses fell, smells, sounds, sight and taste are invigorated.	

		3 Mauri kaha 2 Mauri oho 1 Mauri noho	Ascending life essence Awakening life essence Revealing or uncovering life essence	Your senses fell, smells, sounds, sight and taste are strong. Your senses fell, smells, sounds, sight and taste are awakened. Your senses fell, smells, sounds, sight and taste are inactive.
	23 – Do kaimahi feel connected to the awa?	4 Mauri ora 3 Mauri kaha 2 Mauri oho 1 Mauri noho	Healthy life essence Ascending life essence Awakening life essence Revealing or uncovering life essence	Do kaimahi have easy access to use the awa on a regular basis? The connection between kaimahi and the awa is invigorated. The connection between kaimahi and the awa is strong. The connection between kaimahi and the awa is awakened. The connection between kaimahi and the awa is inactive.
	24 – Can whanau exercise oranga?	4 Nui 3 Pai 2 Ahua Pai 1 Iti	Abundant Good Ok Small or not significant	Can whanau use this site to exercise their physical, spiritual and mental requirements for their oranga? Abundant opportunities to exercise physical, spiritual, and mental oranga requirements e.g. gathering rongoā, special places for karakia, wahi tapu etc. Sufficient opportunities to exercise physical, spiritual and mental oranga requirements e.g. gathering rongoā, special places for karakia, wahi tapu etc. Some opportunities to utilise this space to support physical, spiritual and mental oranga requirements, and area struggles to support their needs. Sparse opportunities and places to utilise this space for physical, spiritual and mental oranga requirements, does not support any needs.
	25 – Could whanau participate effectively in Whānaungatanga / tikanga?	4 Nui 3 Pai 2 Ahua Pai	Abundant Good Ok	Do whanau have the ability to share, wananga, hui around this site? Do whanau have open access to this site to hold hui and noho, for sharing maturing and present? Do whanau frequently access this site to hold hui and NoHo, for sharing maturing and present? Do whanau sometimes have access to this site to hold hui and NoHo, for sharing maturing and present?

		1 Iti	Small or not significant	Is whanau access to this site obstructed and hui and NoHo, for sharing maturing and present are not shared about this site?
Tangata (People) (their cultural interactions and non-cultural impact on the forest)	26 – Can whanau participate effectively in manaakitanga?	4 Nui	Abundant	The ability for whānau to support the well-being of both them and wider whānau is enhanced or diminished through the active use of the site for harvesting (kai (food) e.g. hunting, rongoā or weaving/decorative) purposes and can be shared daily and/or at functions like hui and tangihanga (cultural funeral practices). Activities can also incorporate kaitiakitanga (act of stewardship) (trapping/ restoration projects) and recreational use e.g. bush walks, hunting etc
		3 Pai	Good	Abundant kai/resource available, site is very actively and specifically used.
		2 Ahua Pai	Ok	Sufficient kai/resource available, site is broadly utilised.
		1 Iti	Small or not significant	Some kai/resource available and the site is moderately utilised.
		0 Aue	Not great	Sparse kai/resource available and the site is hardly used.
	27 – Can whanau participate effectively in whanaungatanga ?	4 Nui	Abundant	Whānaungatanga in this instance is the ability to practice taonga tuku iho – intergenerational knowledge transfer, e.g. maramataka (moon/calendar), rāhui (harvesting or use restrictions), and wānanga (learning gatherings), etc.
		3 Pai	Good	Specific mātauranga is shared here often: e.g. Rongoā/weaving/karakia (Incantations)/wānanga etc. mātauranga and tikanga (customs, traditional practices) are shared with whānau at this site, it is regularly used for these practices at this site.
		2 Ahua Pai	Ok	Site known for mātauranga and tikanga sharing with whānau on occasion, whānau likely to come here to practice/share mātauranga.
		1 Iti	Small or not significant	Some mātauranga and tikanga has been shared with whānau at this site, however infrequently but it is known to happen.
0 Aue		Not great	Limited mātauranga and tikanga are shared with whānau at this site, it is uncommon to practice here.	
			Tikanga is not practiced or shared with whānau at this site.	