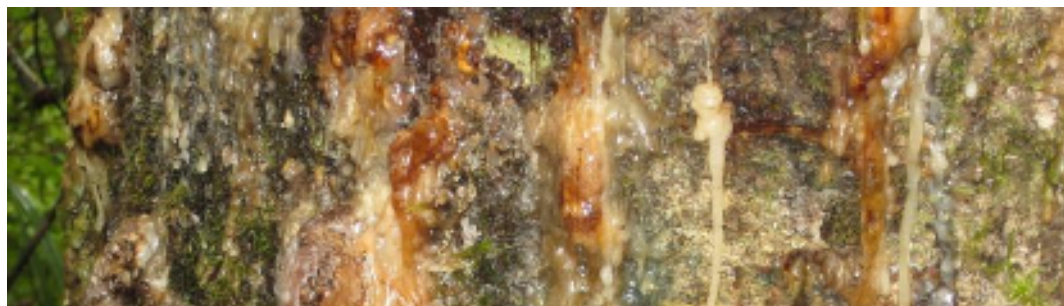
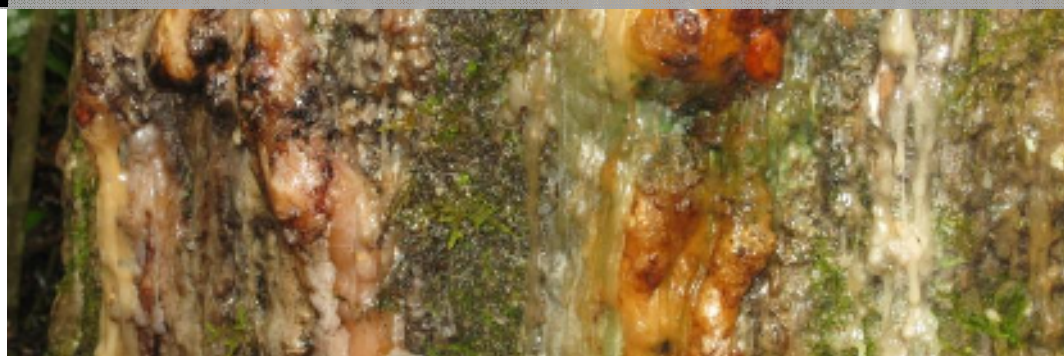




KIA TOITU HE KAURI



CULTURAL INDICATORS FOR KAURI NGAHERE |

Tui Shortland, Repo Consultancy Ltd

Table of Contents

Kupu Whakataki	6
1 Executive Summary	7
2 Introduction	9
3 Background	9
4 What are Cultural Indicators	10
5 Methodology	11
5.1 Literature Review	11
5.2 Kaumatua Interviews	12
5.3 Peer Review	12
5.4 Kauri Dieback Tangata Whenua Roopu Workshop	12
6 Overarching Values	13
6.1 Whakapapa	13
6.2 Ngahere	14
7 Species Specific Cultural Indicators	16
7.1 Minor vegetation	18
7.1.1 Kahakaha / Kowharawhara / Mauri / Kokaha	18
7.1.2 Piripiri	18
7.1.3 Akatea / Aka / Tokai	18
7.1.4 Kohia	19
7.1.5 Rata	19
7.1.6 Mingimingi	20
7.1.7 Hangehange	21
7.1.8 Maire	21
7.1.9 Neinei /emiemi	22

7.2	Trees.....	22
7.2.1	Hinau / pokaka	23
7.2.2	Horoeka.....	23
7.2.3	Kahikatea.....	24
7.2.4	Karamu / karamuramu / kakarangu.....	24
7.2.5	Kauri	25
7.2.6	Kiekie.....	26
7.2.7	Kohekohe	27
7.2.8	Kotukutuku.....	27
7.2.9	Mahoe / hinahina / inihina	28
7.2.10	Mairehau.....	28
7.2.11	Mamaku	29
7.2.11	Manono / kanono / papauma / raurekau	30
7.2.12	Matai	30
7.2.13	Matipo.....	31
7.2.14	Ponga.....	31
7.2.15	Porokaiwhiri / kaiwhiria	32
7.2.16	Pukatea	32
7.2.17	Puriri.....	33
7.2.18	Rewarewa.....	33
7.2.19	Rimu	34
7.2.20	Tanekaha / toatoa.....	34
7.2.21	Tarata	34
7.2.22	Tawa.....	35
7.2.23	Toatoa	36

7.2.24	Totara	36
7.2.25	Whau / whauwhau /houhou/ parapara / puahou	37
7.3	Reptiles & Insects.....	37
7.3.1	Huhu.....	37
7.3.2	Kekereru / kekerengu / hotete / awheto.....	38
7.3.3	Kihikihi.....	38
7.3.4	Kihikihikai	40
7.4	Birds	40
7.4.1	Kakariki.....	40
7.4.2	Kiwi.....	41
7.4.3	Tui.....	41
7.4.4	Kaka.....	42
7.4.5	Kukupu / kereru / kuku	42
8	Recommendations for a Monitoring Programme.....	44
8.1	Maramataka.....	44
8.2	Wairuatanga.....	48
8.3	Invasive species.....	48
8.4	Access.....	48
8.7	Location / Site Selection.....	48
8.8	Monitors / Team Selection.....	48
8.9	Reporting & Evaluating	48
9	Limitations.....	49
10	Appendices.....	49
10.1	Literature Review	49
10.2	Peer Review.....	57

11	Bibliography	60
	Bibliography	60



Tui Shortland
Managing Director

PO Box 1867, Whangarei | Tel - 021 020 43455
Email - tui@repoconsultancy.maori.nz | Web - www.repoconsultancy.maori.nz

Copyright © Repo Consultancy Ltd

This report was commissioned by the Kauri Dieback Tangata Whenua Roopu and is supported by the Kauri Dieback Partnership. The Kauri Dieback Partnership recognises that any Intellectual Property provided by a tāngata whenua entity for the benefit of the Partnership and its objectives remains the property of the tāngata whenua entity unless expressly stated otherwise in writing by duly authorised offices of that tāngata whenua entity. Any person who wishes to use this Report for any purpose other than that specified herein, the prior written consent of the Tangata Whenua Roopu must be obtained.

No liability is accepted by Repo Consultancy Ltd or the researchers with respect to its use by any other person and/or for the accuracy of information provided by third parties.

Kupu Whakataki

Ka tupu ko te pu,

Ko te weu,

Ko te rito,

Ko te take,

Ko te pukenga,

Ko te wananga,

Ko te whe

Tihei wa mauri ora

Te mea tuatahi nga mihi ki to tatou Matua-nui-ki-te-rangi ko ia te ihi, te wehi, te mana me te tapu ko ia te putaketake o nga mea katoa ahakoa te aha, nana nei nga taonga katoa i tukuna mai kia tatou nga uri o te ao. No reira kanui te aroha, kanui nga mihi ki aia mo ake, ake, ake, tonu atu.

Ka huri nga mihi i tenei wa ki nga mate, ko ratou nga puna roimata kua heke, nga manu korero kua rere, nga totara nunui kua hinga i Te Waonui a Tane me koutou hoki nga tini whanaunga kua hinga ki runga i te arawhanui haere, haere, haere atu ra.

Ka huri nga mihi kia koutou nga putee wananga ko koutou e tautoko ana i tenei kaupapa o nga tohu Maori mo nga ngahere kauri , me ki ko Te Iwi Puihi Tipene (Ngati Te Tarawa), Manuka Henare (Ngati Haua, Ngati Kuri, Te Rarawa), Patu Hohepa (Te Mahurehure), John Klaricich (Ngati Wharara), Nau Epiha (Ngati Rehia), Hori Parata (Ngati Korora, Ngatiwai), Moana Wood (Ngati Rua), Terry Smith (Nga Iwi o Whaingaroa), Hoterene Tipene (Te Orewai, Ngati Hau), Te Warihi Hetaraka (Te Uri o Hikihiki, Te Kapotai), Hemi Hau Hoterene (Ngati Te Tarawa), Fred Allen (Te Atiawa).

Ko te kaupapa o tenei ripoata ki te rapua te matauranga Maori no tena hapu no tena hapu e mohio i nga korero o matou matua tupuna mo tenei taonga o tatou te iwi Maori ko te Kauri. Ko te kaupapa o te ripoata nei kia whakapiki , whakamarama ake i o matou rangatiratanga, wairuatanga, manaakitanga, whanaungatanga, me te kaitiakitanga e pa ana ki nga ngahere kauri.

1 Executive Summary

This report has been commissioned by the Tāngata Whenua Roopū of the Joint Agency Response team to investigate the cultural health indicators that may be applied to inform the management of the disease *Phytophthora taxon Agathis*, commonly known as Kauri Dieback or PTA. The Tāngata Whenua Roopū wishes to focus on assessing kauri health and building resilience to the disease. By confirming and utilising cultural indicators the kauri response should be informed by the enduring relationships and practices between tāngata whenua and kauri. In this case, cultural indicators are a mātauranga Māori approach to assessing the health of the environment in so far as this knowledge base can be applied to the health of kauri forests and kauri stands.

Extensive interviews with kaumātua, kuia and other experts in ngahere kauri were held to develop the values to guide the indicators and recommendations for a monitoring programme. Values that have informed the report focus on intellectual property, whakapapa, ngahere, whāngaia te mauri/hau o te kauri, species capability indicators, and whanaungatanga.

The draft report was peer reviewed by Julianne Chetham and kaumātua and was then work-shopped with the Tāngata Whenua Roopū.

To choose which species and indicators were to be included was a four step process. The first step was the inclusion of species which have been found living on kauri (approximately 60 species). The second step was the inclusion of species which have been identified living near kauri (approximately another 30 species). The third step was to include species from the ngahere known to be vulnerable to environmental change such as pepeketua (frogs). Fourthly, the examination of the 100 or so species for knowledge of their cultural value and their value as a cultural health indicator was carried out. Where limited information was found on the species they were excluded from the report.

There were many references to the use of species for ceremonial purposes including for tohi or ceremonies. It was decided that the detail of such information would be excluded from the cultural indicator programme in order to protect the wairua of such matters but a reference would be made using a general statement such as, “this species was used for ceremonial purposes”.

Although outside of the scope of this work recommendations for a monitoring programme have been made. A focus on the māramataka and how the species change during the months and seasons has been drawn together. It is recommended that a wānanga is held to further refine a monitoring programme.

The research found numerous information gaps that must be recognised relating to this report. The short time frame for the report also impacted upon the level of research that could be carried out including accessing kaumātua from across the kauri catchment. It is also recognised that whānau and hapū have differing tikanga in regards to the cultural value and use of indigenous species and that any monitoring programme created should allow for and encourage such differences. It must also be recognised that the body of traditional knowledge that once existed amongst tāngata whenua has been severely degraded, much like the biodiversity within this country. However this report and subsequent monitoring programme is an opportunity for tāngata whenua to reinvigorate such knowledge.

Cultural indicators have not previously been applied to PTA as a new to science disease and research found that indicators of health were better applied to the ngahere as a whole rather than to kauri as a distinct species, with cultural indicators intertwined with the health of the forest as an entity. Indicators of health were more often connected to the lifecycle of species and when one would normally expect to see certain types of activity in a health forest (e.g. fruiting of trees etc.). Kauri is a cornerstone species in the ecosystem with many species dependent on healthy kauri in order to flourish themselves and research did not reveal any particular weighting of indicators nor produce a 'highlights' list of factors which, if present, would indicate healthy kauri.

Mātauranga Māori as it relates to cultural indicators and the response as a whole could benefit from further targeted work in this area. For example, using this project as a template to test for degree of presence or absence of a certain indicator in kauri forests or stands that are healthy or that have PTA. In this way over time, a suite of indicators may arise that provide a pre-cursor to warn either of the presence of or susceptibility to PTA. Conversely, this suite of indicators may highlight optimum ecosystem conditions that increase the chances of survival from or prevention of PTA in kauri.

It is recommended that as further information comes to light regarding relevant indigenous species and their cultural value and uses, this report be updated by way of further editions as this is intended to be a living document.

2 Introduction

In 2008, the fungi like disease, Phytophthora Agathis (PTA), commonly known as Kauri Dieback, was isolated and identified. The disease causes 100% mortality in kauri of all ages and symptoms include; bleeding lesions at the base of the tree, defoliation, yellowing, fanning, dead branches and 'stag heads'. PTA appears to be a soil and water borne disease and is confirmed to be present in the Waitakere Ranges Regional Park, Trounson Park and Waipoua Forest and Aotea - Great Barrier Island. Observed symptoms have been identified in Puketi/Omahuta Forest, Russell Forest and at Mangawhai. It is likely that PTA has been present in Aotearoa at least since the early 1970's.

A Joint Agency Response (JAR) team comprised of representatives from the Department of Conservation, the Ministry of Agriculture and Forestry Biosecurity New Zealand, Northland Regional Council, Environment Bay of Plenty, Auckland Regional Council, Environment Waikato and a collective of representatives from Maori entities with kauri forests forming the Tangata Whenua Roopu (TWR).

Over the past twelve months the TWR has confirmed the work required to properly inform decisions of the JAR. The contribution of the TWR to date has been, a Cultural Effects Assessment, a Stakeholder Engagement Model & Relationship Monitoring Framework, a TWR Strategic and Business Plan and input into the Long-Term Management Plan. The completion of this body of work is a priority for the TWR.

3 Background

Since the outset of the TWR, surveillance involving mana i te whenua has also been recommended. A handful of TWR representatives have attended kauri dieback field workshops to up skill on surveillance and monitoring using scientific methodologies. In the opinion of the TWR a focus should be on assessing kauri health and building resilience to disease. By utilising cultural indicators the kauri response will be informed by the enduring relationships and practices between tangata whenua and kauri. The TWR has therefore requested the development of Cultural Indicators for Healthy Kauri Forests (KCI).

This project is consistent with the overall outcome sought as stated in the Partnership Charter:

"To maintain and enhance the mauri and health of kauri to ensure its special place for all New Zealanders now and into the future".

4 What are Cultural Indicators

The concept of utilizing environmental indicators to assess environmental health has been around since the early 1990s, and the use of cultural indicators is now coming to the fore in international research. Cultural Indicators are derived from tangata whenua spiritual and survival patterns that were based on observation and obligation. (Kaumatua, 2011)

As early as 1991, the (then new) Ministry for the Environment sought expert advice on the potential role of Maori in this new era of environmental monitoring. That advice (Ward 1991) concluded that:

“A holistic approach to environmental monitoring cannot ignore social and cultural values. Traditional monitoring carried out by Maori people was an essential part of survival in New Zealand. They developed an in-depth understanding of the environment upon which they depended. Their traditional view of the environment reflects an integrated approach that needs to be incorporated into a national or regional monitoring system by involving Maori people in planning and decision making at the regional level. The Resource Management Act 1991 clearly expects consultation to occur between the tangata whenua and local authorities. Maori people with traditional knowledge of the environment and an understanding of traditional environmental indicators need to be empowered to contribute to a bicultural monitoring system. Assurance of funding for any work undertaken and the provision of training programmes may be prerequisites for Maori input into this monitoring process”.

The work by Dr Gail Tipa of Ngai Tahu is most likely the formative work in Aotearoa where cultural indicators are used to assess ecological parameters – in that case river and stream health. The Cultural Health Index (CHI) model has since been implemented or adapted by other iwi/hapu around the country. Since 1999 there has been a wave of projects related to Cultural Indicators the majority of which have been produced by Harmsworth (Landcare Research) and Kennedy (Waikato University). Pauling and Kaupapa Taiao (Te Runanga o Ngai Tahu) also produced a significant state of the environment index utilised over a vast area of Te Wai Pounamu (the South Island). In 2010 Repo Consultancy Ltd worked (for Te Runanga o Ngati Hine) with Patuharakeke, Ngati Rehia and Nga Hapu o Ahipara to develop and test a methodology for a Coastal Cultural Health Index. This project was supported by the Ministry for the Environment.

During the Literature Review stage for the development of this report no known publications on cultural health indicators specifically designed for kauri forests were identified.

5 Methodology

There have been several steps in the development of this report. A literature review was carried out to assess the current level of information available regarding kauri ngahere health indicators. Extensive interviews with kaumatua, kuia and other experts in kauri ngahere were held to develop the values to guide the indicators and recommendations for a monitoring programme. The draft was then peer reviewed (include summary of) by Julianne Chetham and kaumatua and was then work-shopped with the Tangata Whenua Roopu. The outcome is a Maturanga Maori approach to assessing and monitoring kauri ngahere.

5.1 Literature Review

To gather existing publications or findings on Cultural Indicators within Aotearoa and those used internationally by indigenous peoples a desktop search was undertaken using internet search engines. Known websites for Cultural Indicators and similar work were also targeted. Publications on Cultural Indicators prepared since the mid 1990's were then examined and informal discussions were held with iwi and hapu resource management practitioners, within the Kauri catchment, as to their opinions of the various Cultural Indicators and their use. Their observations also informed this review.

All sources were analysed and key themes recorded. Common themes included:

- the scarcity of information and examples, including no specific indicators for kauri
- differing purposes for developing cultural indicators
- differing methodologies
- the need for scientific validation and the quantification of results

The Literature Review¹ concluded that there are numerous reasons to develop cultural indicators and that each require different types of indicators and systems for monitoring. In this case assessing the health of kauri forests is the purpose for gathering information. This will be a new set of Cultural Indicators based in general on the best practise example of Hauraki Maori Trust Board in 1999. The monitoring recommendations will need to set out the indicator type, and consider other matters including timing and reporting.

¹ refer to Appendix 1 for full Literature Review

5.2 Kaumatua Interviews

The next step to identifying indicators for Kauri is to identify the cultural values related to kauri forests. Extensive interviews were held with kaumatua, kuia and other individuals identified as having expertise in cultural knowledge of kauri forests, including carving, subsistence, rongoa, Maori anthropology, whakapapa, commerce, gum digging, etc.

The kaumatua interviews assisted in the setting out of the kaupapa for identifying cultural indicators and they also informed recommendations for the monitoring programme. The information gathered has laid the foundation for this report.

5.3 Peer Review

This report was peer reviewed by Juliane Chetham. The peer review concluded that

1. this KCI report is possibly the first work of its kind
2. the information gathered on cultural indicators specific to ngahere is significant and highly valuable
3. it is important to view the KCI report as the first step and recognise the need to undertake further work to develop a framework for utilising the indicators to measure kauri health.

The full peer review can be found in section 10.2.

5.4 Kauri Dieback Tangata Whenua Roopu Workshop

The draft of this report was presented to the Tangata Whenua Roopu Workshop on June 21st. The report was supported in principle and several recommendations were made by the Roopu. The first recommendation was that the Executive Summary be distributed to the Roopu for comment before completion of the final report. The second recommendation was that the Cultural Indicators Report be presented to the Wananga Kaumatua on Kauri Dieback in August and that the development of a monitoring and restoration programme be considered there.

6 Overarching Values

6.1 Whakapapa

Matauranga Maori is a knowledge tradition that grew out of ancient Polynesia. It is created by Maori according to a world view. The Maori World View, the paradigm out of which all Maori culture was created is entitled 'Te Ao Marama'. This 'Te Ao Marama' world view arises out of cosmological whakapapa or genealogies which are metaphorical of the creation of the world and the psyche of the human being. It represents, among other things, the philosophical framework within which Maori history, both in the mythological Hawaiki period and in the Aotearoa period, was played out. As the Hawaiki period proceeded, so the world view developed and evolved but within the constant presence of Ranginui (the sky) and Papatuanuku (the earth). These figures represent the foundations of Matauranga Maori. According to Royal (T, 1999) whakapapa is an analytical tool employed by Maori to understand the nature of phenomena; its origin; connections and relationships to other phenomena; describing trends in phenomena; locating phenomena and extrapolating and predicting future phenomena.

In the case of kauri ngahere there are several accounts that we can draw from. They include the role of kauri in the separation of Rangi and Papa and the whakapapa of species from The Lore of the Whare Wananga and also from Ngatiwai.

Dr Patu Hohepa gave an account of the separation of Rangi and Papa and the personification of the kauri of Tane.

...Discussions amongst the children recounted the light observed from under the armpit of Ranginui when he moved. The children of that time and many generations discussed the light seen briefly by Ranginui's movement. Several Tane were given life, and in the time of Tane Te Waiora, he decided with his brother Rangi Hapaingia that they would separate Ranginui and Papatuanuku. Tane Te Waiora fearing that his father may become aware of his intent told his brother Rangi Hapaingia 'too work out and disregard the protest of our parents, but beware because if our father decides he will turn to stone, then we will be trapped and then the other children who don't agree, will kill us'.

When Ranginui knew that Tane Te Waiora was trying to separate him from Papatuanuku, he started an incantation. Tane Te Waiora called on his other brothers to provide a counter incantation, but Tane Te Waiora found that even when he was on his back, and tried to push with his feet, it didn't work trying to pry Ranginui and Papatuanuku apart, and he couldn't shift them. So he asked his other brother Rangi Hapaingia, 'you will have to help me with this, bend your back, put your hands and legs down, I will go under you and put my shoulders on the ground and I will push with my feet against your chest. And if we can get them apart so that the link between them is gone, then they will be separated.'

While they were doing this, the other children were tasked with going around continuing their incantation and unsettling and disturbing the parents. Pillars grew from both, and Rangi Hapaingia as he was pushed by Tane Te Waiora, who by this time was turned upside down with his head and arms imbedded and with his feet in the air, hooked onto the body of Rangi Hapaingia, this continued for some time and then the separation occurred. Tane Te Waiora told Rangi Hapaingia to keep moving up, until Rangi Hapaingia floated free in the sky.

Above the tikitiki of Ranginui, there was Io, who lived above in the empty space above Ranginui. Tane personified as kauri. Head and arms in the ground, his feet up in the air still holding the separation with his brother Paia or Te Ika nui O Te Rangi. Kauri provides the link between heaven and earth.² preventing the world collapsing and the light being extinguished.

This account contributes to the knowledge of the value of the kauri to Maori in one of the most important events in the history of tangata whenua. The following accounts from The Lore of the Whare Wananga³ and Ngatiwai are of whakapapa that sprang from this event. According to Smith, The Lore of the Whare Wananga,

And so Rangi-nui dwelt with Papa-tua-nuku as his wife; and then he set (hikaia = whakato, to set, plant) plants to cover the nakedness of Papa; for her armpits, her head, and the body; and after that the smaller trees to clothe them both, for the body of the earth was naked. Subsequently he placed the upstanding trees of the forest, and now Papa felt a great warmth, which was all-embracing. After this were placed the insects of all kinds, the aitanga-pekepeketa (the ancestors of the tuatara, great lizard), appropriate to the recesses of the smaller vegetation, the clumps of smaller trees, and the wao-tu-rangi, the great forests (whose heads reach the skies). Then the crabs, the toitoi (the larger species of univalves), the pipi (the bivalves) the ngakihi, the mussel, the haliotis, and similar things, which have shells, were assigned their places to animate the earth and the waters thereof.

Another similar version is the Ngatiwai whakapapa namely 'te unaunahi I whakapiripiri ki te ikanui a Maui' – 'the four fish scales of Maui', symbolized in the four fish scales in Ngatiwai carvings. This whakapapa recites that the four groups of species created were, firstly the minerals, second came the flora, then fauna and then came tangata whenua and all are tied together with te aho tapu, the sacred binding thread.

The above references to whakapapa have informed the grouping of the Kauri Ngahere Cultural Indicators which shall be:

1. minor flora,
2. trees,
3. insects, and
4. birds

6.2 Ngahere

A first step in defining a monitoring programme to ensure kauri health is to consider the requirement to widen the scope of the health assessment to the other species which are known to coexist with kauri. The Maori common word for forest is "ngahere" which means the binding of diverse species living together. One cannot thrive without the other. One account given by Hetaraka is that the ngahere is the example of how we as humans should be living

² Key Informant – Pat Hohepa, Nau Epiha (2011)

³ (Smith, 1913)

and treating each other. The individual species within the ngahere rely upon one another to thrive, each is as important as the other no matter how tall, small, or large. Indicators for kauri health must therefore be derived from other species within the forest in addition to the kauri.

The identification of indicators for kauri ngahere health which relate to the cultural values is a process of further research into the species of value and their relationship to Maori and their own species capabilities. Indicators have been grouped to reflect the whakapapa of the species within kauri ngahere.

The species selection process was:

1. inclusion of species which have been found living on kauri (approximately 60 species)
2. inclusion of species which have been identified living around kauri (approximately 30 species)
3. delimitation of species not referred to by interviewees and publications or websites researched⁴

Step 1 – inclusion of species which have been found living on kauri

Additional to interview findings a paper whereby seven trees in Waipoua were examined in widely scattered localities. Besides climbing the trees, much, observation was done from the ground. As many as 36 species were found on one tree. Altogether a total of 53 species belonging to 37 genera were numbered. Of these, 21 species were true epiphytes, two were climbers, eight or nine were forest trees and the rest were small plants usually found on the ground.⁵

Step 2 - inclusion of species which have been identified living around kauri ⁶

Again interviews and research of websites and publications was carried out to identify species which coexist with kauri.

Step 3 - delimitation of species not referred to by interviewees and publications or websites researched of cultural values

⁴ this is not to say that other species do not hold cultural use but within the time frame of this study

⁵ New Zealand Journal of Forestry, The Kauri as a Host Tree, J Harrison-Smith, 1938, Vol 4(3) p173-177

⁶ sensitive species considered as environmental indicators or known to have existed such as frogs and bats were considered but no info was found on them

7 Species Specific Cultural Indicators

Step 3 was about examining the species for their cultural use, such as references in whakatauki or proverbs, use as tohu, as medicines, carving, waka, food or to assist daily life, etc.⁷

The overarching purpose for developing cultural indicators for kauri health was summed up by Dr Manuka Henare as, “whangaia te mauri/hau o te kauri”. According to Marsden, imminent within all creation is ‘mauri’ – the life-force which generates, regenerates and upholds creation. It is the bonding element that knits all the diverse elements within the Universal ‘Procession’ giving creation its unity in diversity. It is the bonding element that holds the fabric of the universe together. A synonym for Mauri in certain contexts is ‘hau’ (breath). ‘Hau ora’ – ‘the Breath of Life’ is the agent or source by and from which mauri is mediated to objects both animate and inanimate. Mauri-ora and Hau-ora as applied to animate objects are synonymous. Mauri without the qualifying adjective ‘Ora’ (life) is applied to inanimate objects; whilst hau is applied only to animate life. Dr. Manuka Henare also advises on taking a species capabilities approach when assessing wellbeing. This is based on the kauri being entitled to a whole of life experience. For example, that a kauri can have the expectation to

1. kaumatuatanga - live for 2000 years,
2. tinana oranga - to have bodily health and integrity,
3. tawhirimatea - to access clean air to breathe,
4. tamanuitera to access light to grow,
5. tangaroa – to access moisture to grow
6. Papatuanuku – to access soil to grow
7. whanaungatanga - to reproduce,⁸

These are only limited examples of what the species may to reach their full capacity. In the following sections we examine the potential cultural indicators described above for each species.

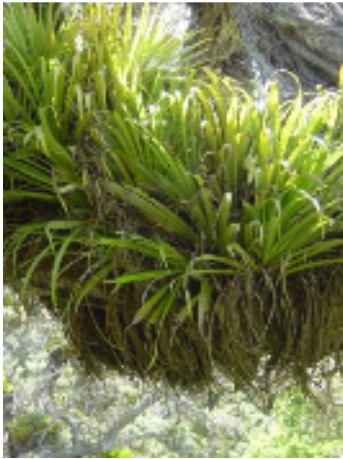
A reference to how each species interacts to the kauri is also made.

⁷ During research on this project there were many references to the use of species for ceremonial purposes including tohi. It was decided that the information would be excluded from the cultural indicator programme in order to protect the wairua of such matters but a reference has been made that the species has “spiritual/ceremonial use”. Also, if rongoa concoctions using single species with a lot of other species that were not identified in Steps 1 or 2 they were not used in this report.

⁸ During the assessment of species and ngahere health a method of whanaungatanga could be utilised drawing on the conservation consideration for harakeke or the health of the marae which are based on assessing the presence of the babies, children, teenagers, pakeke, and kaumatua. A healthy marae for example has the presence of all of these ages. Therefore a healthy species could be assessed by the presence of the species throughout the life cycle of the species.

7.1 Minor vegetation

7.1.1 Kahakaha / Kowharawhara / Mauri / Kokaha



picture: T Shortland, Repo Consultancy Ltd

RELATIONSHIP TO KAURI

The second species to colonise a kauri (Harrison-Smith, 1938)

Sits at the fork of the host tree

CUSTOMARY USE

Renown in song and legend (Kaumatua, 2011)

They are an excellent place to hide (Kaumatua, 2011)

Used both for spiritual and healing purposes (Kaumatua, 2011)

White silky part used as an adornment, also used for babies who have sores

under their arms or in the upper part of the thigh (M, 2003)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

7.1.2 Piripiri



<http://www.hiddenforest.co.nz/plants/tru>

RELATIONSHIP TO KAURI

Occurs in dense patches on the upper side of the larger branches of the kauri (Harrison-Smith, 1938)

CUSTOMARY USE

Aromatic fern used to scent oil for applying to hair or receptacle to be worn (M, 2003)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

7.1.3 Akatea / Aka / Tokai



RELATIONSHIP TO KAURI

Found frequently climbing up kauri and on the ground, seems particularly adapted to kauri country and is not found nearly so frequently in the other parts of the forest (Harrison-Smith, 1938)

CUSTOMARY USE

Used for binding wounds or for trussing a body (Kaumatua, 2011)

For severe wounds it is not merely an antiseptic but also stops bleeding and lessens pain. To apply cut a short length of vine, point one end, apply near wound and blow into the wound (M, 2003)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

7.1.4 Kohia



<http://www.openspace.org.nz/Site/Resourc 1>

RELATIONSHIP TO KAURI

Attaches by tendrils (Harrison-Smith, 1938)

CUSTOMARY USE

Edible small fruit from autumn to summer very fragrant and filled with oil (Kaumatua, 2011)

Used as flavouring in jellies made with seaweed, but most importantly the seeds and fruit pulp provided a valuable cosmetic and medicinal oil (M, 2003)

Propogated due to their value (Kaumatua, 2011)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

7.1.5 Rata



<http://www.piha.co.nz/?p=462 1>

RELATIONSHIP TO KAURI

Found climbing down kauri (Kaumatua, 2011)

CUSTOMARY USE

The legend of Rata (Kaumatua, 2011)

“well done, shallow root” is a saying used to deride a person who is easily discouraged and gives in readily; just like the rata he has no hold on the ground on which he stands (M, 2003)

The sight of the crimson flowers of the rata is a sign that summer has arrived and it is time to harvest the kumara (Kaumatua, 2011)

The proverb “He kurapae na Mahina” – the cast away feathers (treasure) of Mahina” (M, 2003)

Legend tells us that the crimson of the rata blossoms came from the blood of Tawhaki, who was cast out of the heavens to fall on this world. His grandson was Rata, the man who offended the wood fairies by not paying proper homage to Tane when he sought a tree for a canoe from the forest (Kaumatua, 2011)

Bark used as a poultice for ringworm and venereal disease and other sores, abscesses etc; Bathe in crushed bark for swollen feet and rheumatism and broken bones; Bark very good for cuts and wounds – abrasions and minor cuts stop immediately; Sap used for

astringent and antiseptic properties; Honey collected for sore throats; Bark also good for diarrhea and dysentery; Young leaves are chewed and applied in hollow in tooth – sap of the vine is an antiseptic (M, 2003)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

7.1.6 Mingimingi



<http://web.auckland.ac.nz/uoa/science/ab 1>

RELATIONSHIP TO KAURI

Found on all the trees examined except smallest (Harrison-Smith, 1938)

CUSTOMARY USE

This shrub named *juniperina* for the resemblance of its leaves to that of the European juniper, also shares some medicinal uses for example the leaves are used to treat rheumatism and kidney disorders. The book also refers to its use as a sinker, to make fire and the berries are pleasant to eat (M, 2003)

boiled leaves for asthma (Kaumatua, 2011)

sweet berries popular with children (Kaumatua, 2011)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

7.1.7 Hangehange



<http://www.forestflora.co.nz/Plant%20pro 1>

RELATIONSHIP TO KAURI

Not uncommon to find but small
(Harrison-Smith, 1938)

CUSTOMARY VALUE

"The leaves and bark have proved very useful for medicinal purposes and in cooking. Its leaves impart a much desired flavour and colour when added to food in cooking, whether the food be fish, roots or tubers, or berry kernels...Its wood was sometimes used to dye flax or kiekie fibre black. In recent times the shoots and berries have been used with mordants to create purple, blue and grey dye colours. The scent of flowers is very strong and honey made from the nectar is light amber in colour, and tastes as it smells" (M, 2003)

Also sap from leaves used for skin infections on children (Kaumatua, 2011)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

7.1.8 Maire



<http://ketenewplymouth.peoplesnetworknz. 1>

RELATIONSHIP TO KAURI

Found growing near kauri

CUSTOMARY USE

"while every tree in the forest has provided the Maori with useful and indispensable material to be pressed into service when required and is thus treated with respect, some are more highly placed because of the aristocratic lineage bestowed upon them. Such a tree is the maire which is claimed to be the off-spring of Te Puwhakahara and Hine-pipi. It belongs to a select group claiming direct descent from Tane te waotu, originator of the forest, and it is a tree that cannot be felled without proper ceremonies being carried out. "E kore au e ngawhere, he maire tu wao, ma te toki e tua", that is, "I cannot be broken easily, I am a maire of the forest, only to be felled by the axe of the woodman," A remark sometimes applied to an obstinate person or one who holds tenaciously to old ideas. More complimentary is this saying: "E! ko te matakahi maire!" – "See, there is a warrior!" (One who can cleave the ranks of the enemy). Maire seems to retain its force even when chopped up for firewood. It was popular fuel in the

old days because it smoke a little and gave off a good light. Yet there was a belief that should any seeds be kept in the same house where maire was being burnt, they afterwards would not sprout when planted, a sign no doubt of its sacredness. “ (M, 2003)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

7.1.9 Neinei /emiemi



<http://www.landcareresearch.co.nz/resear 1>

RELATIONSHIP TO KAURI

Found growing near kauri

CUSTOMARY USE

Used for making cloaks (Kaumatua, 2011)

Used for making flutes, the stems were hollowed out and the bark removed (M, 2003)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired

4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

7.2 Trees

In the forest, Maori saw a hierarchy of trees similar to that in human society, and they spoke of the grandest of them as rakau rangatira, “chiefly trees”. Because their wood was the most valuable, and because they towered above their fellows, they were the lords of the forest, not to be cut down without ceremony. The totara, kauri, kahikatea and rimu were among the chiefly ones. A man who was told he was becoming grey might reply that moss grows only on chiefly trees. Often a tree represented a person, as when a childless man was said to be he tangata mamore, “a branchless man” (Museum, 2005)

7.2.1 Hinau / pokaka



<http://www.bushmansfriend.co.nz/xurl/Pag 1>

RELATIONSHIP TO KAURI

Few small found growing on and around kauri

CUSTOMARY USE

“A type of bread was made from the dark flour-like meal between the rind and the kernel of hinau fruit. A little water was mixed with the hinau meal to make a dough for cakes or loaves of about six inches in diameter and about two inches thick. These were wrapped in rangiora leaves or mouku fern for the particular flavours they imparted, then cooked in the hangi. The colour was not unlike that of brown bread, but darker, and the loaves would keep for a considerable time in storage. Hinau bread was highly prized and often used for barter or in the formal exchange of gifts between villages. There is a

celebrated proverb that goes “If you awaken me from my sleep, let it be for hinau bread”. (M, 2003)

Bark is powerful astringent and bath can cure severest skin disease (Kaumatua, 2011)

The pulp of the berries of which are made into a consistency like that of boiled arrowroot, and is taken by those who are recovering from a lengthy illness. The pulp is said to be a most nourishing kind of food. Its very oily and easy to digest. (M, 2003)

Has ceremonial uses

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

7.2.2 Horoeka



[T Shortland, Repo Consultancy Ltd 1](#)

RELATIONSHIP TO KAURI

Found growing near kauri

CUSTOMARY USE

Used for making spears for pigeon hunting and brushes for painting (M, 2003)

Berries are ripe when few others are – good for birds (Kaumatua, 2011)

“The Maori regarded the horoeka tree and the kiwi bird as special: the horoeka for its marvelous change in foliage and unusual fruit maturing, the kiwi for its giant egg in comparison to the size of its

body and the fact that it lived in a burrow.” (M, 2003)

“The inner bark which is like a net encircling the tree, is stripped off and chewed for the gum-like fluid it contains. This is eaten to gently open the bowels after the effects of diarrhea have passed” (M, 2003)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

7.2.3 Kahikatea



<http://www.wairereboulders.co.nz/plants/> 1

RELATIONSHIP TO KAURI

Rare but can be found growing around kauri

CUSTOMARY USE

Wood for weapons and canoes, torches from its bark, gum resin as a masticatory and soot for tattooing (M, 2003)

One of the trees that Mahuika cast the element of fire into (Kaumatua, 2011)

Berry stimulating and diuretic (Kaumatua, 2011)

Infusion of the wood is good tonic (M, 2003)

Ceremonial uses (M, 2003)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

7.2.4 Karamu / karamuramu / kakarangu



T Shortland, Repo Consultancy Ltd 2

RELATIONSHIP TO KAURI

Frequent occurrence, looked very healthy, shiny leaves, with fruit (Harrison-Smith, 1938)

CUSTOMARY USE

One of the highly used medicinal plants (Kaumatua, 2011)

Ceremonial uses (Kaumatua, 2011)

Edible fruit (Kaumatua, 2011)

Vapour bath for rheumatism; leaves and branches for cuts, ulcers, wounds, eczema, broken limbs; taken internally for bowel, urinary and menstruation flow difficulties, for colds, kidney,

bladder and stomach complaints (M, 2003)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

CUSTOMARY USE

Hori Parata gave an account of the kauri tree and the whale(quote from Hori's thesis),

(For example) The Legend of the Kauri and the Sperm Whale: In times long past a sperm whale came ashore and spoke to the kauri. "Kauri! Come with me to the sea, which is fresh and cool." "No!" said the kauri. "You may like the sea but I prefer to stand here with my feet in the soil." "All right said the whale. Then let us agree to exchange our skins." So that is why the bark of the kauri is thin and full of resinous oil. Because of their huge size, both are regarded as rangatira of their respective realms. Moreover, their bark and skin show similarities of texture, while kauri gum is like the ambergris found in the intestines of the sperm whale.

During the expedition of Hineamaru and her parents Torongare and Hauhaua they stopped in the hills at Whakatere and were given a feed from the top of the kauri (Kaumatua, 2011)

Kauri is second only to the totara in terms of value by Maori within the research area.

"soot doesn't burn hot but burns black so can understand how may have been used as pigment or paint." (Kaumatua, 2011)

Te Iwi Puihi confirmed that a certain type of canopy is required for the soil type

Kai I te toto o te kauri, kaha ki te kai I nga kauri - gum, by using a pocket knife but was outlawed. kauri gum – got own and kept it (Kaumatua, 2011)

hardened gum on the ground used for starting fire, others stated that they never burn anything you eat so did not use gum a fire starter. (Kaumatua, 2011)

waka –only one per year over last 100 years has been felled; are only designated after reaching higher than the tuahu of a whare; would dig down around roots on southern side and cut every second until the tree lay down;

7.2.5 Kauri



Sourced from Hoterene Tipene 1

karakia, plant trees where the head falls; (Kaumatua, 2011)

carvings – any timber is used for carving, totara the most important but in more recent years kauri has been used for waka as there are still large specimens to use. The picture below shows Ngatokimatawhaorua given by Te Kapotai. (Kaumatua, 2011)

timber – no te atua nga kauri, so they belong to the people so should not sell unless planted by you (Kaumatua, 2011)

During interviews kaumatua stated that the very high value of the kauri was due to colonisation and their commercial value.

Gumfields between Waimahae and Pitiwai clear felled between 1900-1918. By the time Te Tiriti was signed all bush in the Bay of Islands was gone apart from at Waikare so they came inland. (Kaumatua, 2011)

hori and len korero around impacts and employed as people to deforest.

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

7.2.6 Kiekie



T Shortland, Repo Consultancy Ltd 3

RELATIONSHIP TO KAURI

Found growing on and near kauri

CUSTOMARY USE

Kiekie and harakeke are brothers

Great material for absorbing dye and used for weaving for baskets, hats, tukutuku and lashing (Kaumatua, 2011)

Used as insulation in wharehui (Kaumatua, 2011)

The male kiekie produces several beige-brown stamen that are enclosed by whitish, succulent and fleshy bracts (modified leaves) called tāwhara. These are very sweet-tasting and are a highly desirable food but hard to beat the rats to (Kaumatua, 2011)

The female plant develops three or four fruit (called ureure), with green remnant flower parts (carpels) on the surface. These fruits are also surrounded by fleshy bracts, though not quite as luscious as those of the male plant. The green segments swell and become pinky brown as the fruit ripens in late autumn (May). The rough surface can be peeled away to reveal the sweetish pulp on the inside. It is customary to protect the bracts and fruit from rats by tying leaves over the flower spikes. (Kaumatua, 2011)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

CUSTOMARY USE

“In the second month of the old Maori winter season, that is roughly June, the white sprigs of kohekohe flowers appear on the limbs of the tree, at just the same time that its scarlet coloured seeds emerge from the capsules of last season. A time for the tui to wax fat on them, which gives rise to the saying comparing a fat person with a tui – “He koko (tui) kai kohe” – “A kohekohe-eating tui”. To ridicule a coward, another well known expression may be used – “Te waka pukatea, te waka kohekohe” – “The canoe (made of) the pukatea, the canoe (made of) kohekohe”. Both are of soft woods and will become waterlogged in a short time. A coward will not fight for long, nor endure hardship for any length of time.” (M, 2003)

For boils, gonorrhea, bleeding wounds, skin disorders, rashes and inflammations; internally as tonic, stops the secretion of milk for women who have lost their children, to reduce fever, asthma, treatment of bowel, urinary and menstruation problems, sore throats, for female haemorrhage, bleeding piles, general blood disorders, and skin eruptions, for karaka poisoning (M, 2003)

“Strong tasting sea birds were cooked with leaves from the kohekohe...such leaves disguised the strong taste and imparted the strong flavour of garlic. The leaves themselves were ‘opening food’; that is, they had the same aperients value as our onions, garlic, spinach etc.” (M, 2003)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

7.2.7 Kohekohe



<http://www.piha.co.nz/?p=460> 1

RELATIONSHIP TO KAURI

Found living near kauri

7.2.8 Kotukutuku



<http://www.teara.govt.nz/en/shrubs-and-s> 1

RELATIONSHIP TO KAURI

Found growing near kauri

CUSTOMARY USE

“It is one of New Zealand’s only indigenous deciduous tree, deriving its name meaning to let go, referring to its habit of shedding its reddish bark readily in winter, as well as its leaves.”
(M, 2003)

It must not be used for firewood as not only does it burn poorly but food cooked with it may cause temporary paralysis of the legs, gout and skin disorders. (M, 2003)

Promotes lochial discharge, juice is astringent, light blue pollen used by youth of both sexes to ornament their faces, also used for rheumatic pains and skin diseases (M, 2003)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

7.2.9 Mahoe / hinahina / inihina



<http://www.bushmansfriend.co.nz/melicytu> 1

RELATIONSHIP TO KAURI

Not frequent but has been found living on and near kauri

CUSTOMARY USE

The mahoe is one of the trees which Mahuika cast the fire element into (Kaumatua, 2011)

“To carry fire when travelling from place to place, smouldering sticks of mahoe were placed in a stone container.” In post-contact times charcoal of mahoe wood was used in the preparation of certain kinds of gunpowder. (M, 2003)

Externally used for large open wounds, for use in tattooing; internally for diarrhea, or to facilitate blood flow during menstruation, or in the case of abortion, induces saliva (to banish a desire for water) (M, 2003)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

7.2.10 Mairehau



<http://www.bushmansfriend.co.nz/xurl/Pag> 2

RELATIONSHIP TO KAURI

Quite plentiful on larger trees, never more than two and a half feet high, appeared at home (Harrison-Smith, 1938)

CUSTOMARY USE

“Anointing the body with oil was once considered of utmost importance for both health and ornament. It was at one time the chief remedy of the Maori for cooling feverish skin disease, for treating swellings of the joints and generally to allay pain...To scent these oils, aromatic flowers, leaves, gums, mosses, grasses and ferns were added according to requirements. One plant used was the mairehau...All the plant parts are highly aromatic: the white flowers yield a perfume, and the leaves and terminal branchlets are dotted with red glands which produce a clear greenish-yellow oil once used to scent titoki oil, shark oil and pigeon fat” (M, 2003)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired

4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

7.2.11 Mamaku



T Shortland, Repo Consultancy Ltd 4

RELATIONSHIP TO KAURI

Found growing near kauri

CUSTOMARY USE

The tallest of the ferns (Kaumatua, 2011)

“As the fronds of the tree fern drop away, young leaves take their place.”
After decay comes growth: when a chief dies, there will be others to take his place (Kaumatua, 2011)

Poultice used for swellings of the foot and sore eyes (M, 2003)

Edible pith applied raw for sores and chafing (M, 2003)

Scrape young shoots and use to draw out boils (Kaumatua, 2011)

Gum smeared onto cuts to stop bleeding or chewed for diarrhea (M, 2003)

Liquid from young shoots has loosening effect for constipation and bringing down afterbirth (M, 2003)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – spores, seedlings, mature plants, flowering, etc

7.2.11 Manono / kanono / papauma / raurekau



T Shortland, Repo Consultancy Ltd 5

RELATIONSHIP TO KAURI

Frequent occurrence, looked very healthy, shiny leaves, fruit (Harrison-Smith, 1938)

CUSTOMARY USE

"A bright yellow dye comes from manono bark...Manono dye is notable for its fastness and for the variety of colours obtainable by using various mordants. When the old time Maori had finished shaping and smoothing down a whalebone patu, he could choose to colour it by placing scrapings of manono bark around the patu; then he would bind it around with flax and place it in a hangi. The dye from the bark stained the whalebone a rusty-looking yellow." (M, 2003)

Other uses of manono bark are medicinal – itching, cuts, bruises, reduces swellings and sprains, soothes aches and pains (Kaumatua, 2011)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

7.2.12 Matai



<http://www.taranakiplants.net.nz/natives 1>

RELATIONSHIP TO KAURI

Found growing near kauri

CUSTOMARY USE

Astringent, used surgically for fractures, dislocations, sprains, bruises, or any external ailment, antiseptic; internally for swelling of neck, severe pain in the stomach (M, 2003)

Ceremonial uses (M, 2003)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

7.2.13 Matipo



T Shortland, Repo Consultancy Ltd 6

RELATIONSHIP TO KAURI

Found growing near kauri

CUSTOMARY USE

The nightmare tree – people are tied to this tree when need to be punished. Paheka plant this around their houses but shouldn't as causes nightmares. (Kaumatua, 2011)

Balances blood cells – when you look at the leaf of the plant it looks like veins (Kaumatua, 2011)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired

5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

7.2.14 Ponga



T Shortland, Repo Consultancy Ltd 7

RELATIONSHIP TO KAURI

Found growing near kauri

CUSTOMARY USE

“The woody fibre of the ponga is poisonous and was used to terrible effect in war to ensure the death of those who were wounded by ponga tipped spears.” (M, 2003)

Used to blaze a trail by turning up the leaves and can glow during the night too (Kaumatua, 2011)

Pith used as poultice for running sores, or eruptions on the skin and prevents infection and has a beneficial feeling when placed on tired eyes (Kaumatua, 2011)

Gum is a vermifuge (expels intestinal worms) (M, 2003)

Pikopiko (young shoots) eaten daily (Kaumatua, 2011)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – spores, seedlings, mature plants, flowering, etc

7.2.15 Porokaiwhiri / kaiwhiria



<http://www.forestflora.co.nz/Plant%20pro 2>

RELATIONSHIP TO KAURI

Found growing near kauri

CUSTOMARY USE

Musical instruments were made out of the wood as has excellent resonant qualities (M, 2003)

“Porokaiwhiri wood was preferred for its excellent resonant qualities, being fashioned into pahu drums; into purerehua which were childrens toys; titi, the batons used in stick games.” (M, 2003)

Also used as vapour bath for rheumatism (M, 2003)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

7.2.16 Pukatea



T Shortland, Repo Consultancy Ltd 8

RELATIONSHIP TO KAURI

Found growing near kauri

CUSTOMARY USE

“An old proverb goes “totara chips float, those of pukatea become water logged” – a message with a double meaning to the effect that while youth goes out and about, the aged stay home.” (M, 2003)

Bark used for scrofulous sores, neuralgia, cutaneous diseases, tuberculosis and chronic ulcers, analgesic; internally – for venereal disease, stomach problems, and toothache (M, 2003)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

7.2.17 Puriri



T Shortland, Repo Consultancy Ltd 9

RELATIONSHIP TO KAURI

Found growing near kauri

CUSTOMARY USE

Revered for its thickness and could not be penetrated by colonial assault (Kaumatua, 2011)

"It also got the nickname "iron tree: (by the European settlers) because of its ability to blunt any axe." (M, 2003)

External ulcers, especially under the ears and to treat sore throats (Kaumatua, 2011)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

7.2.18 Rewarewa



T Shortland, Repo Consultancy Ltd 10

RELATIONSHIP TO KAURI

Found growing near kauri

CUSTOMARY USE

"It is told by the old and wise that the seed pod of the rewarewa is the model for the Maori canoe, even to the figurehead and projecting stern of the war canoe. There is parable of a son going in search across the waters to seek his long-disappeared father. The lad modeled his canoe on a rewarewa pod that he had first placed experimentally in the water to test its seaworthiness." (M, 2003)

Charcoal also used to stain carvings, rotten rewarewa emits a phosphoric light and was used to light some houses (M, 2003)

"Near Whangarei it was located after torrents of rain had exposed patches of the wood in creek beds. The phosphorescence lasts only until the wood dried out." (M, 2003)

To stop the flow of blood from a wound, honey – for sore throats, inhaled for a bad cough (Kaumatua, 2011)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired

4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

Rimu bark infused treats running ulcers and burns, scalds etc, gum is astringent, (M, 2003)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

CUSTOMARY USE

Pigment for dying (Kaumatua, 2011)

Dysentery, diarrhea, haemorrhage, used for menstruation and birth. (M, 2003)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

7.2.19 Rimu



T Shortland, Repo Consultancy Ltd 11

RELATIONSHIP TO KAURI

Found growing near kauri

CUSTOMARY USE

“When the tree was more plentiful, its bark was stripped off to use on cooking fires. It gives off little or no smoke.” (M, 2003)

The small berries of the rimu occur on female trees and can be eaten (Kaumatua, 2011)

7.2.20 Tanekaha / toatoa



<http://www.taranakiplants.net.nz/natives 2>

RELATIONSHIP TO KAURI

Found growing near kauri

7.2.21 Tarata



http://www.nzplantpics.com/sfeature_gall 1

RELATIONSHIP TO KAURI

Found growing near kauri

CUSTOMARY USE

Perfume used for scenting oil
(Kaumatua, 2011)

The honey is light, and fine (Kaumatua, 2011)

Tarata gum was used as a glue of sorts for lashing etc (M, 2003)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

7.2.22 Tawa



<http://www.nzpcn.org.nz/page.asp?conserv 1>

RELATIONSHIP TO KAURI

Found living near kauri

CUSTOMARY USE

“In bygone days what the karaka nut was to the coastal dwelling Maori, the tawa kernel was to hill – dwelling people; that is, the essential food supplement, the forest sourced equivalent of the kumara or the taro...Dried tawa kernels were sometimes roasted before the fire or set in hot ashes, where they had a tendency to explode, rather like popcorn or chestnuts. This has led to a series of expressions comparing noisy children and others with the crack of the tawa kernel as it bursts. One that is

derogative of a noisy, talkative person is; “Like the crackling tawa fires on the shore, and the ever-moving shoal of tarakihi at sea, is the speed of his mouth when talking.” (M, 2003)

Wood used to spear pigeons, used also for pains in the stomach and colds and coughs (M, 2003)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

7.2.23 Toatoa



RELATIONSHIP TO KAURI

Found living near kauri

CUSTOMARY USE

Cure for scrofula and for boils, abscesses and septic infections and rheumatism and as a substitute for tea (M, 2003)

It comes up in the summer and dies down in the winter (Kaumatua, 2011)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired

5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc
- 7.

7.2.24 Totara



T Shortland, Repo Consultancy Ltd 12

RELATIONSHIP TO KAURI

Commonly found living around kauri

CUSTOMARY USE

“Like the flax plant, the harakeke, the totara tree was put to multiple uses by the Maori in the old days: the wood for housing, canoes, musical instruments and toys; the bark for torches and containers for water, preserved birds, rats etc; and the raw berries for food

being sweet to the taste, but with a flavour of turpentine.” (M, 2003)

Rakau rangatira (Kaumatua, 2011)

Totara are the easiest to split for planks, they stay tika when split e.g. good for sills, their sap when fresh is poisonous to bora, and it grows straighter for longer; (Kaumatua, 2011)

Bark used as splints, smoke is good for piles, venereal sores or lesions, liquid from inner bark boiled good for reducing fever, (M, 2003)

“kua hinga he totara” said when a great person has passed (Kaumatua, 2011)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

7.2.25 Whau / whauwhau /houhou/ parapara / puahou



T Shortland, Repo Consultancy Ltd 13

RELATIONSHIP TO KAURI

Found growing near kauri

CUSTOMARY USE

Heralds the coming of summer by blossoming (M, 2003)

Sticky sap used to fill lashing holes of waka, honey made from spring nectar has top class light amber colour but a bitter oily after taste. (M, 2003)

Used as a lotion on the eyes of those who are suffering from loss or partial loss of sight, useful in the treatment of scrofula (tuberculosis of the neck) and kidney and bladder problems. (M, 2003)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired
5. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

7.3 Reptiles & Insects

7.3.1 Huhu



<http://www.teara.govt.nz/en/beetles/1/3/1>

RELATIONSHIP TO KAURI

Can be found amongst dead wood around kauri

CUSTOMARY USE

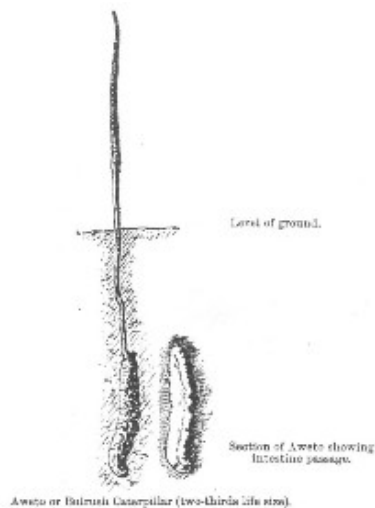
The larvae of the huhu beetle found in fallen logs or rotten wood of rimu, matai and kahikatea, one of the most delectable wild foods. the active grub is also known as *tungarakau*, or *tungahaere*; as the pre-pupa in its cell it is called *tataka*, and when the beetle emerges, but is still white, it is termed *pepe*, but after assuming its brown colour and flies as a beetle it is known as *tungarere*. *Huhu* is now loosely applied to the adult beetle. (D, 1952)

Often eaten (Kaumatua, 2011)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

7.3.2 Kekereru / kekerengu / hotete / awheto



http://www.nzetc.org/tm/scholarly/tei-Ba_1

RELATIONSHIP TO KAURI

Found near roots of the rata

CUSTOMARY USE

“The Kauri bug (called by the Maoris the Kekereru), with its power of emitting a terrible and unbearable smell when alarmed, has been so often and so fully dealt with by writers, that I shall content myself with simply making a sketch of the insect, leaving its smell to the imagination of my readers, and will proceed to describe the most curious of the New Zealand native insects I have

seen, call the bulrush caterpillar. This caterpillar becomes changed into a white vegetable substance while still retaining its caterpillar shape. It is from three to three and a half inches in length, and when about to assume the chrysalis form buries itself in the ground, and it is supposed that in doing so, some of the minute seeds of a fungus become inserted between the scales of its neck; these the insect, being in a sickly condition, is unable to rid itself of, and they vegetate and spread through the whole of the body, completely filling and changing it entirely into a vegetable substance, though retaining exactly the caterpillar form, even to the legs, head, mandibles, and claws. From the nape of the neck shoots one single stem, which grows to a height of eight or ten inches, its apex resembling very closely the club-headed bulrush in miniature. This insect plant is generally found growing at the root of the rata tree. It has no leaves, and if the stem by chance becomes broken off, another arises in its place, though two stems are never found growing simultaneously from one caterpillar. When fresh, the vegetable substance of which it is composed is soft, and has strong nutty flavour, and the natives are

fond of eating it; they also use it burnt and ground to powder as colouring matter for tattooing purposes. In every instance the caterpillar is found perfect in shape and size, without any sign of contraction or decomposition, and it is therefore presumed that the vegetating process takes place during the insect’s life.” (P, 1993)

Dried and powder used for tattoo pigment (Kaumatua, 2011)

Powder used for asthma (M, 2003)

Edible also tastes nutty (M, 2003)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

7.3.3 Kihikihi



T Shortland, Repo Consultancy Ltd 14

RELATIONSHIP TO KAURI

Found on and near kauri

CUSTOMARY USE

Cicada, tree-locust; kīhikīhi is derived from kīhi = to make a murmuring, indistinct sound, to make a sibilant sound. As even the European can recognise, by their distinctive songs, groups of cicada species, and sometimes individual species, it is reasonable to say that the Maori was more expert; so I suggest that *kīhikīhi* is referable to such species of clamorous song in which there is a dominating sibilance; in further support of this we have the proverbs: *Mehemea ka tae ki te waru, ka piri taua iwi, te kīhikīhi, ki to ratou tupuna ki a Tane—He kīhikīhi tara ki te waru*—When the eighth month (December) arrives that tribe, the cicadas, cling to their ancestor Tane (trees)—The cicada that stridulates in the eighth month; hence another

proverb in reference to a noisy party, *Me kīhi kei te waru*—Like cicadas in the eighth month; also the Maori compared the comparably noisy English language to *kīhikīhi* (*He reo kīhikīhi*—The cicada language), and called the European *pakeha* *he kīhikīhi*; furthermore,

Fable of the Ant and the Cicada.

The *pokorua* (ant) said to the *kīhikīhi* (cicada), “Let us be diligent and collect food during the summer, that we may retain life when the winter arrives.” “Not so,” remarked the cicada; “rather let us ascend the trees and bask in the sun on the warm bark.” Even so, the ant laboured at collecting and storing food for the winter. The cicada said, “This is true pleasure, to bask in the warm sun and enjoy life. How foolish is the ant, who toils below!” But when winter came, and the warmth went out of the sun, behold, the cicada perished of cold and hunger, while the ant, how snug is he in his warm home underground, with abundance of food!

As the cicada clung to his tree, rejoicing in the warmth of summer, he sang,—

He pai aha koia taku pai
He noho noa
Piri ake ki te peka o te rakau
E inaina noa ake
Ki te ra e whiti nei
Me te whakatangi kau i aku paihau.

The following is said to be the song sung by the industrious ant:—

Hohoro mai e te hoa
Kauaka e whakaroa ara ra
Ka turua ta te popokorua
Rawe noa tangata ki whakahauhau—c
Ki te keri i te rua mo te ua o te rangi
Mo te makariri wero iho i te po nei—e
Me te kohi mai ano i te kakano—e
Hai ora mo tamaroto, kia ora ai—e.

(Zealand, 1908)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

7.3.4 Kihikihikai



RELATIONSHIP TO KAURI

Found on or near kauri

CULTURAL USE

The smaller species, which was mashed into a paste, and used as an article of diet; the song is a muted version of the kihikihi (Technology, 2011)

SPECIES INDICATORS

7. kaumatuatanga – length of life
8. tinana oranga - bodily health & integrity
9. tawhirimatea – air needed & acquired
10. tamanuitera – light needed & acquired
11. Tangaroa – moisture need & acquired

12. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

7.4 Birds

Maori of the past thought about manu, (birds) a great deal, they were an endless source of imagery and ideas. Maori associate manu with the world of the spirits. With their power of flight, manu have a freedom and unpredictability of movement, similar to that possessed by supernatural beings, and their homes above us are close to the sky — which is tapu, sacred, high and unreachable. Sometimes the dead were asked to return as manu and communicate with the living. In an old waiata a chief is urged, Kia korero koe i te ngutu o te manu, Kia hoki ana mai to wairua ki te ao na i! Speak with the bill of a bird, Let your soul come back to us in this world! Their singing at dawn was a sign of the triumph of light over darkness, and it was associated with oratory. Departed chiefs might be praised as taku manu whakaoho i te ata, “my bird that woke the dawn”. (M O. , 2003)

7.4.1 Kakariki



<http://www.astronomynz.org.nz/index.php? 1>

RELATIONSHIP TO KAURI

Found living on or near kauri

CUSTOMARY USE

Once numerous are now scarcely found on the mainland (M O. , 2003)

“Kakariki fly fast, with rapid wing-beats and much loud chatter, and when feeding together they babble and squawk. Large, excited flocks would form at abundant food sources, and the noise made was proverbial...one example of comparison is at times the fogleman of a waka (the person who chanted the time for the paddlers) was sometimes known as the kakariki. Another is “He kakariki kai ata” – a kakariki who feeds at dawn – this is of a greedy fellow who begins to eat directly after awakening instead of going to his

work since it was not custom to eat early in the morning. (M O. , 2003)

SPECIES INDICATORS

7. kaumatuatanga – length of life
8. tinana oranga - bodily health & integrity
9. tawhirimatea – air needed & acquired
10. tamanuitera – light needed & acquired
11. Tangaroa – moisture need & acquired
12. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

7.4.2 Kiwi



<http://www.wellingtonzoo.com/net/explore 1>

RELATIONSHIP TO KAURI

Found living near kauri

CUSTOMARY USE

Kiwi feather cloaks are rare and treasured (Kaumatua, 2011)

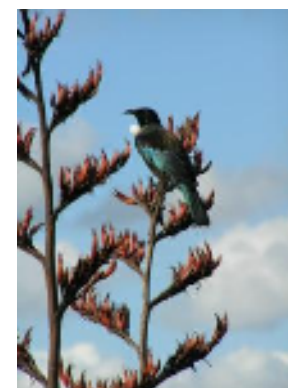
Te rahui kiwi a Moeahu (Kaumatua, 2011)

Tukua atu au kia rere me he matakokiri anewa I te rangi, Te rokohina taku tapuwae nei, To te tapuwae o wai? ko te tapuwae o kiwi, o weka – said to spenden ones pace - The male parent leaving the egg at night has been likened in lamenting songs referring to loneliness within the home (M O. , 2003)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

7.4.3 Tui



T Shortland, Repo Consultancy Ltd 15

RELATIONSHIP TO KAURI

Lives around or on kauri

CUSTOMARY USE

Greatly valued (Kaumatua, 2011)

Reserved for persons of rank (Kaumatua, 2011)

He koko whakamoe, ka mate te tangata – when benumbed like tui, people die (M R. , 2003)

Feathers much admired and used for cloaks (Kaumatua, 2011)

Kept and trained to speak (Kaumatua, 2011)

Admired for their skill in flight (Kaumatua, 2011)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

7.4.4 Kaka



<http://www.elkeith.com/photography/galle1>

RELATIONSHIP TO KAURI

Found living on or near kauri

CUSTOMARY USE

Another popular game bird but shrewd and wary so hard to catch (M O. , 2003)

Considered to be noisy and highly assertive – he kaka wahanui – said about silly talkative people. (M O. , 2003)

When a man remained silent in his own village but behaved self-importantly elsewhere, it might be said that: he kuku ki te kainga, he kaka ki te haere. this saying was also applicable to a man so mean that he ignored his social duty to call an invitation to strangers as they approached his home – but who then, when himself a traveler, would sound his trumpet to make sure of receiving an invitation, and afterwards complain loudly about the quality of the food he had received. (M O. , 2003)

Seen as good-mannered as unlike the kukupa that gobbles up berries the kaka holds its food in one foot and eats politely (M O. , 2003)

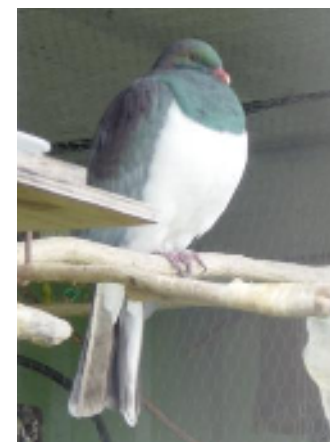
Red feathers prized adornments
(Kaumatua, 2011)

SPECIES INDICATORS

1. kaumatuatanga – length of life
2. tinana oranga - bodily health & integrity

3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired
6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

7.4.5 Kukupa / kereru / kuku



T Shortland, Repo Consultancy Ltd 16

RELATIONSHIP TO KAURI

Found on and near kauri

CULTURAL USE

Maui turned himself into a kukupa
(Kaumatua, 2011)

When coos in the night a bad omen, so too if one comes across any kukupa eggs (M O. , 2003)

Prized game bird – ritualistic process to catch, first caught given to eldest female (Kaumatua, 2011)

SPECIES INDICATORS

1. kaumatuatanga – length of life

2. tinana oranga - bodily health & integrity
3. tawhirimatea – air needed & acquired
4. tamanuitera – light needed & acquired
5. Tangaroa – moisture need & acquired

6. whanaungatanga – seeds, seedlings, mature plants, flowering, etc

8 Recommendations for a Monitoring Programme

Although outside of the scope of this project some insights and suggests for a monitoring programme for assessing cultural health of ngahere kauri have come to light and are share in this section.

8.1 Maramataka

The maramataka is considered to be the most effective tool to monitor cultural health due to the numerous indicators and their range and rates of change. It is recommended that initially monthly assessments are made over the first year and then moved back to seasonal assessments. This is to avoid further impacts on the ngahere by the added presence of people. As discussed with kaumatua - enhanced human presence has caused ill health including emissions from cars, hunting and gathering still not free access to everyone to roam all over the bush.

The table below shows some potential indicators of the species described above, during the months of the year⁹.

	MAKARIRI			KOANGA			RAUMATI			NGAHURU		
SPECIES	TE RUHERE O PIPIRI	WHA AO MAHURU	RIMA O WHIRINGA NUKU	ORO O KOPU	WHITU O NA KI HA	WARU TAMA HAHOA	IWA O MANAWA WHAREHA	NGAHURU	TIKOTIKO IERE	POUTUTE RANGI	TE MAATAHI OTE TAU	TE MAARUA ROA ¹⁰
Kahakaha								Seeds				
Piripiri		Spores spread	Spores spread	Spores spread	Spores spread	Spores spread						
Aka	nectar	Nectar								nectar	nectar	nectar
Rata							nectar	nectar	nectar	nectar	nectar	
mingimingi		flowers	flowers	Flowers	flowers	flowers	Flowers					

⁹ The names of the month are from Ngati Hine, Tipene but it is acknowledged that there are variations amongst iwi.

¹⁰ sourced from Hoterene Tipene

hangehange								seeds	Seeds	Seeds	seeds	
maire				flowers	Flowers Fruit	Flowers Fruit	Fruit	Fruit	Fruit			
Neinei										seeds	seeds	seeds
Hinau	Fruit	Fruit							Fruit	Fruit	Fruit	fruit
Horoeaka									seeds	Seeds	Seeds	seeds
Kahikatea										Fruit and seeds	Fruit and seeds	Fruit and seeds
Karamu								Fruit and seeds	Fruit and seeds	Fruit and seeds	Fruit and seeds	Fruit and seeds
Kauri									seeds	Seeds	seeds	
kiekie										Seeds	Seeds	Seeds
Kohekohe	Nectar Seeds	Nectar Seeds	Nectar Seeds									Nectar seeds
Kohia	fruit	fruit	Fruit		flowers	flowers	flowers					
kotukutuku			nectar	nectar	nectar	Nectar seeds	Fruit seeds flowers	Fruit seeds	Fruit seeds	Fruit seeds		
Mahoe								seeds	Fruit seeds	Fruit seeds	Fruit seeds	
Mairehau												
Mamaku				Seeds	Seeds	Seeds						

Manono									Fruit and seeds	Fruit and seeds	Fruit and seeds	Fruit and seeds
matai												
Matipo												
Miro	Fruit and seeds	Seeds	Seeds							Fruit and seeds	Fruit and seeds	Fruit and seeds
Ponga				Seeds	Seeds	Seeds						
Porokaiwhiri			seeds	Seeds	seeds	Fruit and seeds	Fruit and seeds	Fruit and seeds	Fruit and seeds	Fruit and seeds	Fruit and seeds	
Puka								Seeds	Seeds	Seeds	seeds	
Pukatea												
Puriri	Fruit, seeds and nectar	Fruit, seeds and nectar	Fruit, seeds and nectar	Fruit, seeds and nectar	Fruit, seeds and nectar	Fruit, seeds and nectar	Fruit, seeds and nectar	Fruit, seeds and nectar	Fruit, seeds and nectar	Fruit, seeds and nectar	Fruit, seeds and nectar	Fruit, seeds and nectar
rewarewa				nectar	nectar	nectar	nectar					Kiekie-tawhara & ureure
Rimu										Fruit and seeds	Fruit and seeds	Fruit and seeds
Tanekaha												
tarata										Fruit and seeds	Fruit and seeds	Fruit and seeds

Tawa										Fruit and seeds	Fruit and seeds	
Toatoa							Bushy	Bushy	Bushy			
Totara								Seeds	Seeds	Fruit and seeds	Fruit and seeds	
Towai												
Whau				nectar		seeds	Blossoms seeds	seeds	Fruit and seeds	Fruit and seeds	Fruit and seeds	Fruit and seeds
huhu												
Kihikihi												
Kihikihikai												
Awheto												
Kakariki								Feeding in canopy				
brown kiwi												
Tui	Fat										Fat	fat
Kaka							fat					
Kukupā				Eating flowers & young leaves of kowhai,	Eating flowers & young leaves of kowhai,	Eating flowers & young leaves of kowhai,	Eating flowers & young leaves of kowhai, puha etc			Feeding on tawa	Feeding on tawa	

				puha etc	puha etc	puha etc						
--	--	--	--	-------------	-------------	-------------	--	--	--	--	--	--

8.2 Wairuatanga

That a monitoring programme adhere to the disciplines of wairuatanga including karakia and that a duty of care in behavior at the start be adhered to. Monitors must prepare by going in with the right attitude to enter into the realm of the tupuna, right mind, karakia. These things must be assessed before monitors begin the monitoring process. (Kaumatua, 2011)

8.3 Invasive species

The presence and impact of pest species, both animal and weed, should be considered in a monitoring programme.

8.4 Access

Access to areas was considered a major impact by kaumatua on kauri. The impacts of car emissions and increased foot traffic¹¹ and other human impacts have drastically impacted on the natural order of kauri ngahere species. Other additional impacts include access eg. to trampers, tracks in the vicinity etc, development nearby, proximity to agriculture, exotic forestry maybe, level of modification??

8.7 Location / Site Selection

Often the density and spread of the monitoring is dependent on the purpose of the research and the financing available for the project.

8.8 Monitors / Team Selection

In all cases the hapu/iwi must carry out the monitoring and at times monitored in collaboration with external researchers.

8.9 Reporting & Evaluating

There were different types of reporting mechanisms produced for the use of cultural indicators. Often images were taken and tables produced with a numeric rating system to conclude health of the resource or ecosystem. Whilst room for comments by monitors were made available for qualitative results, the focus on quantitative data was derived from the need for cultural indicators to be given weight alongside western scientific frameworks.

In this case it is recommended that monitors are provided with a booklet including the cultural value and use of all species with an area that they can input notes regarding their site assessments

¹¹ outlined in detail in the Kauri Dieback Tangata Whenua Roopu CEA

9 Limitations

It must be noted explicitly that this project has been carried out with a limited timeframe and budget and that there are many whanau, hapu and iwi within the kauri distribution area that could not be consulted with during the development of this report. It is also noted that the matauranga regarding this kaupapa has been restricted by colonisation and there is a lack of practice and publications covering this kaupapa.

However, the hope is that this publication assists in the revitalization of matauranga Maori and tikanga pertaining to ngahere kauri.

10 Appendices

10.1 Literature Review

Purpose

This literature review has been undertaken to inform the preparation of a guideline for developing Cultural Health Indicators for Kauri Forests in relation to the Joint Agency Response to Kauri Dieback.

The purpose of this review is therefore to scan the available literature, distil the common themes, such as principles and methodologies, of value to an Aotearoa (New Zealand) context and consider “best practice”. These results can then be used to inform a set of guidelines for best practice in preparing the Cultural Indicators.

Background

In 2008, a fungi like disease called Phytophthora Agathis (PTA) commonly known as Kauri Dieback, causing 100% mortality in kauri of all ages, was isolated and identified. Symptoms of PTA are bleeding lesions at the base of the tree, defoliation, yellowing, fanning, dead branches and ‘stag heads’. PTA

appears to be a soil and water borne disease confirmed to be in the Waitakere Ranges Regional Park, Trounson Park and Waipoua Forest and Aotea - Great Barrier Island. Observed symptoms have been identified in Puketi/Omahuta Forest, Russell Forest and Mangawhai. It is likely that PTA has been present in Aotearoa at least since the early 1970's.

A Joint Agency Response team comprised of representatives from the Department of Conservation, the Ministry of Agriculture and Forestry's Biosecurity New Zealand, Northland Regional Council, Environment Bay of Plenty, Auckland Regional Council, Environment Waikato and a collective of representatives from Maori entities with kauri forests forming the Tangata Whenua Roopu (TWR).

Over the past twelve months the TWR has confirmed the work required to properly inform decisions of the JAR. The contribution of the TWR to date has been, a Cultural Effects Assessment, a Stakeholder Engagement Model & Relationship Monitoring Framework, a TWR Strategic and Business Plan and input into the Long-Term Management Plan. The completion of this body of work is a priority for the TWR.

Since the outset of the TWR, surveillance involving mana i te whenua has also been recommended. A handful of TWR representatives have attended kauri dieback field workshops to up skill on surveillance and monitoring using scientific methodologies. In the opinion of the TWR a focus should be on assessing kauri health and building resilience to disease if required. By utilising cultural indicators the kauri response will be informed by very long term relationships and practises between tangata whenua and kauri. The TWR has therefore requested the production of Cultural Indicators for Healthy Kauri Forests (KCI).

This project is consistent with the overall outcome sought as stated in the Partnership Charter:

"To maintain and enhance the mauri and health of kauri to ensure its special place for all New Zealanders now and into the future".

The concept of utilizing environmental indicators to assess environmental health has been around since the early 1990s, and the use of cultural indicators is now coming to the fore in international research.

As early as 1991, the (then new) Ministry for the Environment (MfE) sought expert advice on the potential role of Maori in this new era of environmental monitoring. That advice (Ward 1991) concluded that:

“An holistic approach to environmental monitoring cannot ignore social and cultural values. Traditional monitoring carried out by Maori people was an essential part of survival in New Zealand. They developed an in-depth understanding of the environment upon which they depended. Their traditional view of the environment reflects an integrated approach that needs to be incorporated into a national or regional monitoring system by involving Maori people in planning and decision making at the regional level. The Resource Management Act 1991 clearly expects consultation to occur between the takata whenua and local authorities. Maori people with traditional knowledge of the environment and an understanding of traditional environmental indicators need to be empowered to contribute to a bicultural monitoring system. Assurance of funding for any work undertaken and the provision of training programmes may be prerequisites for Maori input into this monitoring process”.

The work by Dr Gail Tipa of Ngai Tahu is most likely the formative work in Aotearoa where cultural indicators are used to assess ecological parameters – in that case river and stream health. The Cultural Health Index (CHI) model has since been implemented or adapted by other iwi/hapu around the country. Since 1999 there has been a wave of projects related to Cultural Indicators the majority of which have been produced by Harmsworth (Landcare Research) and Kennedy (Waikato University). Pauling and Kaupapa Taiao (Te Runanga o Ngai Tahu) also produced a significant state of the environment index utilised over a vast area of Te Wai Pounamu (the South Island). In 2010 Repo Consultancy Ltd worked (for Te Runanga o Ngati Hine) with Patuharakeke, Ngati Rehia and Nga Hapu o Ahipara to develop and test a methodology for a Coastal Cultural Health Index. This project was supported by MfE. Literature related to KCI that are readily available on-line have been reviewed and summarised in this report. There is currently no known publication on cultural health indicators specifically designed for forests.

Methodology

To gather existing publications or findings on Cultural Indicators within Aotearoa and those used internationally by indigenous peoples a desktop search was undertaken using internet search engines. Known sites for Cultural Indicators and similar work were also targeted.

Known sources of existing Cultural Indicators prepared in recent years were examined. Informal discussions were held with iwi and hapu resource management practitioners, within the Kauri catchment, as to their opinions of the various Cultural Indicators and their use. Their observations have also informed this review.

All sources were analysed and key themes recorded. A list of key issues/questions was prepared to allow comparison of key points and issues. All sources were compiled into the Literature Sources list (Section 8). A summary of findings was prepared (Section 4, 5 & 6) and general conclusions formed and documented (section 5).

Common Themes

4.1 The scarcity of information and examples

In comparison to scientific monitoring models there is little Cultural Indicator information available either internationally or nationally and no existing literature on kauri forests specifically. Ecosystems monitored included wetlands, freshwater streams, coastal environments including fisheries and state of the environment inventories.

4.2 The purpose

The purpose for producing cultural indicators has varied. Some examples are:

- to complement other Maori and scientific research
- assistance in the production of Cultural Impact/Effects Assessments
- hapu/iwi long term monitoring programmes
- hapu/iwi state of the environment reporting
- measuring progress towards desired goals
- assistance in the prioritisation of remediation
- detection of resource changes, and
- health assessments

However, almost nothing exists on how cultural indicators may actually feed into national environmental monitoring, reporting, planning or policy design. The KCI provides an opportunity for central and local government to support and assess the success of the use of cultural indicators.

4.3 Methodology

Unlike Environmental Performance Indicators there is no prescribed process for method or content of Cultural Indicators. Therefore, there remains a great deal of divergence in the content, structure and resourcing of what is produced. Obviously, cultural values differ between iwi groups however there is widespread agreement that common standards and guidelines need to be developed. The Coastal Cultural Health Index was therefore developed as a methodology rather than a prescription.

When the purpose of the cultural indicators is confirmed the methodology to develop the monitoring programme generally follows. Common methodologies employed favour a number of steps. These include, criteria to determine indicator type, location, timing, who will be the monitors and reporters and what the costs will be.

Indicator Type – there were many different types of indicators considered. Here is a list of some:

- kai availability
- state, pressure and status of mauri
- kai, taonga and/or species health
- sensory indicators – sound, smell, etc
- access to resources
- celestial phenomena
- weather
- life cycles of plants and animals
- observed behaviour of indigenous species
- tikanga
- state of habitat
- migrations of species
- flowering plants

Location – often the density and spread of the monitoring is dependent on the purpose of the research and the financing available for the project.

Timing – Short term monitoring mostly focussed on taking a one off/snap shot in time to get an assessment of health of particular resources or ecosystems. Medium to long term monitoring also considered trends to assess how events may have impacts on resources or rates of change. Longer term monitoring utilise the maramataka (the Maori calendar) and the life cycle of plants and animals.

Monitors

In all cases the hapu/iwi carried out the monitoring and at times monitored in collaboration with external researchers.

Reporting

The majority of authors were employed by research institutes but there were a few examples produced by iwi or hapu with the financial support of local or central government.

There were different types of reporting mechanisms produced for the use of cultural indicators. Often images were taken and tables produced with a numeric rating system to conclude health of the resource or ecosystem. Whilst room for comments by monitors were made available for qualitative results, the focus on quantitative data was derived from the need for cultural indicators to be given weight alongside western scientific frameworks.

4.5 The need for scientific validation

As indicated above, western science seeks indicators of environmental health that can be measured quantitatively and validated statistically. Kennedy and Jefferies (2009) concluded at the end of the Planning Under a Cooperative Mandate project that:

“In practice, however, there is widespread concern that despite these provisions [in the RMA and LGA], Māori are largely excluded from local government resource management processes and their values subordinated to those of the wider community, particularly western scientific values (p.1)

There was however no literature available that considered whether the cultural indicator information gathered was skewed due to the need to create quantitative data.

Best Practise Examples

As noted in section 4.1 there are no best practise examples to draw from. After several discussions with other iwi and hapu practitioners within the kauri catchment it is considered however that the Hauraki Maori Trust Board example focussing on seasonal calendars, tikanga, observation and inherited knowledge etc was the favoured model to draw from the developing the KDI. Notwithstanding this finding the vast knowledge developed by Tipa, Harmsworth and Kennedy and Pauling will no doubt have influence in the KDI too.

Conclusions

To conclude, there are numerous reasons to develop cultural indicators that require different types of indicators and system for monitoring. In this case assessing the health of kauri forests is the purpose for gathering information. The guideline will need to set out the indicator type, timing and reporting more explicitly. This will be a new guideline based in general on the best practise example of Hauraki Maori Trust Board in 1999. The need for scientific validation will need to be decided upon by the Joint Agency Response to ensure appropriate commitment and support for the KDI is assured.

Literature Sources

Chetham, J., & Shortland, T., (2010) *A Coastal Cultural Health Index for Te Taitokerau*, Whangarei, New Zealand: Te Runanga o Ngati Hine,

Chetham, J., & Shortland, T., Nuttall, P., & Newell, A., (2010). *Maori Cultural Environmental Monitoring Stocktake*. Whangarei, New Zealand: Repo Consultancy Ltd.

Hambly, H., (1997) International Development Research Centre. *Grassroots Indicators for Sustainable Development*

[file:///C:/Documents%20and%20Settings/Administrator/My%20Documents/01%20Contractors/MAF/Kauri%20Dieback/TWR/Cultural%20Indicators/Lit%20Review/IDRC%20Reports%20Archive%20%20Grassroots%20Indicators%20for%20Sustainable%20Development%20\(April%201995\).htm](file:///C:/Documents%20and%20Settings/Administrator/My%20Documents/01%20Contractors/MAF/Kauri%20Dieback/TWR/Cultural%20Indicators/Lit%20Review/IDRC%20Reports%20Archive%20%20Grassroots%20Indicators%20for%20Sustainable%20Development%20(April%201995).htm)

Harmsworth, G., (2002) *Coordinated Monitoring of New Zealand Wetlands, Phase 2, Goal 2: Maori environmental performance indicators for wetland condition and trend*, Landcare Research

Harmsworth, G.R., & Tipa, G., (2006) *Maori Environmental Monitoring in New Zealand: Progress, concepts, and future direction*, Palmerston North, New Zealand: Landcare Research

Hauraki Māori Trust Board, (1999). *Environmental Performance Indicators Technical Paper No.57 Maori Hauraki Customary Indicators Report*. Wellington, New Zealand: Ministry for the Environment

Jollands, N., & Harmsworth, G., (2007) Participation of indigenous groups in sustainable development monitoring: Rationale and examples from New Zealand; In *Ecological Economics* 62

Kaupapa Taiao, (2004). *State of the takiwa: Cultural Monitoring and Reporting on the Health of our Environment*, Te Runanga o Ngai Tahu

Kennedy, N., (2009) *A Kaupapa Māori Outcomes and Indicators Framework, Planning Under Cooperative Mandates*, Wellington, New Zealand:

Kennedy, N., & Jefferies, R., (2007). *The PUCM Kaupapa Maori Environmental Outcomes and Indicators Model*, Hamilton, New Zealand: University of Waikato

Makey, L., (2010). *The World of Kaipara: Information Review and Gap Analysis Phase One*. Integrated Kaipara Harbour Management Group

Tipa, G., (2006). *A Cultural Health Index for Streams and Waterways: A tool for nationwide use*, Wellington, New Zealand: Ministry for the Environment

Ward, J. C., (1991) *Integrated environmental monitoring, Information Paper No. 37.*, Dunedin, New Zealand: Lincoln University

Cultural Indicators for Kauri Ngahere

Peer Review June 2011

Juliane Chetham

1. Introduction

The purpose of this paper is to provide a peer review of the Prepared for the Ministry of Agriculture and Forestry by request of the Kauri Dieback Joint Agency Response Tangata Whenua RoopuTWR representatives have attended kauri dieback field workshops to up skill on surveillance and monitoring using scientific methodologies, the use of cultural indicators to complement these methodologies is desired in order to focus on assessing kauri health and building resilience to disease.

The use of environmental indicators in assessing environmental health has been increasing since the early 1990s, and the use of cultural indicators specifically has recently become an important area of research internationally. A growing number of projects nationally are identifying and utilising cultural indicators in the management of natural resources, particularly in relation to freshwater, however, there is currently no known publication on cultural health indicators specifically designed for forests.

2. Methodology

The methodology employed for the KCI report includes a literature review of relevant publications, followed by an extensive interview process with a number of cultural experts to identify values and indicators for kauri. The accounts provided by the kaumatua around values illustrate that the health of kauri cannot be ascertained by looking at kauri alone, rather a “ngahere”, or kauri ecosystem approach should be taken. This means that indicators for kauri health must be derived from other species within the forest in addition to the kauri.

Principles to guide the development of the indicators, such as wairuatanga, manaakitanga, kaitiakitanga and matauranga were described. Likewise, the KCI report stresses the importance of maramataka and seasonal trends in ngahere health.

A very comprehensive list of indicators was identified. They have been classified in a manner that reflects the strata of most types of kauri forest; the forest floor, understory, sub-canopy, canopy and emergent layers. An additional animal indicator has been included to ensure that the germinators are present.

The consideration of other indicators that may influence the health of Kauri could be of value here, particularly negative “outside influences” for example:

- Adjacent land-use/ or level of modification (eg. Indigenous forest, agriculture, residential use etc)
- Accessibility (proximity to walking tracks etc)
- Presence of pest species (weeds, possums etc)
- Influence of water (what type of water bodies are in the area, identify overland flow paths – particularly as water is a vector).

Overall, the methodology for the identification of indicators is robust and the information collected of significant value.

3. Monitoring Programme

The monitoring programme provides a detailed table setting out potential indicators by month. Processes are explained for applying the values previously identified, such as wairuatanga, described in the report as “duty of care” prior to going into the ngahere and covering aspects of tikanga such as performing karakia. Participating kaumatua have also called for a “species capability” or “species potential” approach to be taken to align with the principle of kaitiakitanga. This requires the following factors to be assessed during monitoring:

- length of life,
- growth,
- life cycle,
- air,
- light,
- freedom,
- soil,
- canopy,
- climate

Other aspects covered in the monitoring programme include site selection, monitoring team selection, training on data collection, and reporting and evaluation.

Given there do not appear to be any existing cultural monitoring programmes for Ngahere (at least not published), the monitoring programme as described in the KCI report is essentially breaking new ground. The various steps in the monitoring programme are sound and proven in earlier work on freshwater and coastal cultural monitoring projects. The difficulty is collating the expanse of information gathered into a useful and effective framework for analysis. Further refinement of exactly how the indicators will be used to measure health will assist the monitoring programme. It may also be useful to describe how (if at all) cultural monitoring will be paired with current western surveillance methods utilised in the Kauri Dieback response.

The purpose of the KCI report appears to focus primarily on the identification of cultural indicators. This has clearly been achieved. However, for the purpose of clarity and to ensure the effective use of these indicators, development of a framework for measuring health is necessary.

This essentially demands a second research project that could include holding a series of wananga with the kaumatua and katiaki monitors to discuss and formulate method for measuring health of kauri. Ideally, such wananga would be held following an initial round of site surveys once a “feel” for the general health of sites and the range of indicators present was obtained. Wananga should provide for the determination of a framework for measuring cultural health that is consistent and able to be duplicated (whilst taking into account the variance in ecology and tikanga across rohe) thereby assuring the health measure is not attributable to an individuals perception alone. This process should allow the fomulation of a robust sampling guidebook to be utilised for ongoing monitoring.

4. Conclusion

The KCI report is possibly the first work of its kind and the information gathered on cultural indicators specific to ngahere is significant and highly valuable. It is important to view the KCI report as the first step and recognise the need to undertake further work to develop a framework for utilising the indicators to measure kauri health.

11 Bibliography

Bibliography

- D, M. (1952). The insect people of the Maori. *Journal of the Polynesian Society* , 1-61.
- Harrison-Smith, J. L. (1938). The Kauri as a Host Tree. *New Zealand Journal of Forestry* , 173-177.
- Kaumtua. (2011). (S. & Wood, Interviewer)
- M, O. (2003). *Birds of Aotearoa: A Natural and Cultural History*. Singapore: Reed Publishing.
- M, R. (2003). *Maori Healing and Herbal*. Paraparaumu: Viking Sevenses.
- Museum, A. (2005). *Te Ao Turoa Education Kit*. Retrieved June 2011, from Auckland Museum: http://www.aucklandmuseum.com/site_resources/library/Education/Teachers_Guide/Teacher_Resources_Library/Maori_Education_Kits/TeAoTuroaBN.pdf
- P, B. (1993). *Kaipara, or, Experiences of a settler in north New Zealand*. Auckland: Southern Reprints.
- Smith, S. P. (1913). *The Lore of the Whare Wananga*. Retrieved June 28, 2011, from Internet Sacred Text Archive: <http://www.sacred-texts.com/pac/lww/index.htm>
- T, R. (1999). *Matauranga Maori: Paradigms and Politics*. Retrieved June 2011, from Te Ahukaramu Charles Royal: <http://www.charles-royal.com/assets/m%C3%A4tauranga%20and%20the%20writing%20of%20m%C3%A4ori%20history.pdf>
- Technology, A. U. (2011). *Maori Dictionary websearch kihikihikai*. Retrieved June 2011, from Maori Dictionary: <http://www.maoridictionary.co.nz/index.cfm?dictionaryKeywords=kai&n=1>
- Zealand, T. R. (1908). Insects and other "Small Deer". *Transactions and Proceedings of the Royal New Zealand 1868-1961* , 238-241.