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Te Mauri o te Kauri me te Ngahere: Indigenous Knowledge, te Taiao (the Environment) and Wellbeing

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ABSTRACT. Ko te kauri he rākau rongonui, he rākau rangatira puta noa i Te Tai Tokerau. The kauri (*Agatha australis*) is a chiefly tree that represents strength and is an iconic symbol for Te Tai Tokerau, Northland, Aotearoa|New Zealand. This research was undertaken with whānau (kin group) participants based in Te Tai Tokerau to explore contemporary mātauranga (knowledge and wisdom pertaining to Māori, the Indigenous people of New Zealand) about the connection between the taiao (natural environment), ngahere (native forest), kauri and the hauora (health and wellbeing) of people. A summary of some of the key messages from participants is presented as four themes: 1) ūkaipō, the ngahere as a place of sustenance and renewal; 2) e kore te kauri e tū mokemoke, a holistic approach to caring for the forest; 3) barriers to caring for the forest and kauri dieback (*Phytophthora agathidicida*); and 4) transmission of mātauranga, the importance of sharing knowledge. Findings highlight opportunities for change and solutions that have the potential to enable the ngahere and health of people to thrive. This study illustrates how mātauranga Māori and Indigenous Māori psychologies can inform biodiversity approaches in Aotearoa|New Zealand, while also facilitating (re)connection with the environment.

Keywords: Indigenous psychologies; biosecurity; forest health; taonga species; mātauranga Māori

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Introduction

The kauri tree (*Agatha australis*) is a well-known rākau rangatira (chiefly tree) associated with strength and prowess due to its commanding size and presence that has become an iconic symbol for Te Tai Tokerau, Northland and the Far North of Aotearoa, New Zealand. According to Māori cosmology, the Māori creation narrative, te ao mārama (the world of light) was created when the primal parents Papatūanuku (Earth Mother/feminine element) and Ranginui (Sky Father/masculine element) were separated, the Atua (god/deity) chosen to separate them was Tāne Mahuta, whose domain is the ngahere (Marsden, 2003; Royal, 2005). Some versions of this creation narrative suggest that kauri is the physical representation of the legs of Tāne Mahuta, holding the sky above and the earth below, allowing light to enter and preventing the world from collapsing (Shortland, 2011). The spread of kauri dieback (*Phytophthora agathidicida*), a soil-borne pathogen that causes kauri to die, became a grave concern for hapū (kinship groups/tribes) and iwi (tribes/nations) based in Te Tai Tokerau since it was recognised as a threat to kauri ecosystems in 2008 (Lambert et al., 2018). Kauri dieback is susceptible to soil-borne spread by humans. Mātauranga Māori (Māori knowledge, wisdom, and practices, education, knowledge, understanding and skill pertaining to Māori, the Indigenous people of New Zealand) and locally informed

Indigenous psychologies or Kaupapa Māori psychology (Levy, 2007), including 'principles of interrelationships, traditional knowledge, language, autonomy and self-determination' (Waitoki et al., 2018, p. 165) offer a unique lens to better understand the role humans can and do play in the wellbeing of taonga (treasured or prized) species and rākau rangatira (chiefly trees) such as kauri.

Māori connection with the whenua (land)

Papatūānuku is the whenua (land), the earth mother, also referred to as the ūkaipō, and provides life and nourishment through the whenua. Ūkaipō is a term referring to tribal homelands and is also the word for the first form of sustenance that babies receive from their mothers (Dell, 2021; Roberts et al., 1995). The word ūkaipō can be understood by breaking down the word into its parts, *ū* meaning breast, *kai*, food and *pō*, the night: the breast milk received by a baby in the night that provides comfort and contentment. Similarly, for tāngata whenua (people of the land), being on the land provides a deep sense of reassurance, vitality, and the feeling of home. Whenua is also the name for the placenta of a baby that is returned to the whenua, just as we are returned to the kōpū (womb) of Papatūānuku in death as a way of maintaining this connection. Whakapapa (genealogical relationships and connections, descent) and identities are interwoven with the landscape that holds memories of tūpuna (ancestors), who maintained an intimate relationship with the whenua. Thus, the land is a vital part of identity and wellbeing, springing from a deeply embedded attachment to Papatūānuku (Mark et al., 2022).

Māori connection with kauri

Atua (gods/deities), also known as environmental representatives who are linked to the land, sea, and stars, are personified in Māori cosmology as aspects of our natural environment. According to some accounts, there are 140 atua (environmental deities), 20 tipua/tupua (various non-human beings), and 40 kaitiaki (animal guardians) (Heke, 2017). Tāne Mahuta, the atua and guardian of the forest, co-habited with other female atua to create all the various forms of rākau (trees) and living organisms in the ngahere. Rākau adorned and protected the body of Papatūānuku after the separation from Ranginui. The depth of the connection between Māori and the environment is well known (Mark et al., 2022); however, there is limited documented literature about the connection between Māori and kauri.

In traditional times, tūpuna rarely cut down rākau rangatira, such as kauri, unless they were used for a significant purpose such as building whare (traditional houses), whakairo (carving) or tārai waka (building canoes/vessels) (Irwin et al., 2017). Tikanga (correct procedures and protocols) guided ceremonies, including karakia (prayers) and rituals acknowledging various atua and the status of the kauri in both physical and spiritual realms (Turei & John, 1993). Kauri trees live for hundreds to thousands of years, providing a home to many other rākau, birds, and life forms, therefore cutting down mature kauri had a tremendous impact on the

immediate surroundings, reverberating outwards to the ngahere and the wider ecosystem. Similarly, kauri timber is not widely used for physical ailments in traditional plant medicine, possibly due to its status as a rākau rangatira. According to rongoā Māori (healing) expert Joanne Hakaraia-Olson Olson (Ngāti Raukawa, personal communication, May 20, 2021), tohunga (specialists in traditional healing) worked with kauri in the wairua (spiritual) realm. Kāpia (kauri gum or resin) has two living botanical purposes in the ngahere: to cure wounds and to protect the rākau from fungus, insects, and microbes, assuring the long-term existence of kauri (Randerson, 2022). Kāpia had great value to Māori; for generations, it was used as chewing gum and as an insecticide to keep bugs away from kūmara (sweet potato) plots. Kāpia itself resembles a golden glow and was used as a fire starter as it burnt easily. In traditional times it was wrapped in kōrari (flax) and burned as a light source for mahinga kai (gathering food), such as eeling at night. Burnt kāpia soot was mixed with hinu (animal fat) to make dark pigment for the art of tāmoko (traditional tattooing) (Randerson, 2022; Walrond, 2007).

Kauri are tūpuna (ancestors), Ātua and kaitiaki (guardians) to many iwi in Te Tai Tokerau. Te Roroa iwi are mana whenua (customary authority over land) of Waipoua Forest, home to the largest remaining intact kauri forests in Aotearoa, New Zealand and the three largest kauri trees, including Tāne Māhuta, estimated to be over 2,000 years old, standing at 51 metres high with an estimated girth of 14-17 metres. A report assessing the impact of kauri dieback outlined the depth of connection held through successive generations of tūpuna, affirmed by the whakataukī (significant saying, proverb, aphorism), ko ahau te kauri ko te kauri ko ahau – I am the kauri, and the kauri is me (Ngakuru et al., 2010). Other similar variations of this whakataukī are heard in other regions referring to aspects of the taiao that are pillars of strength and wellbeing, inseparable from the people who are descendants of those places. Kōrero tuku iho (knowledge passed down through generations, oral narratives) and pūrākau (traditional narratives) about the kin relationship between Tāne Mahuta and Tangaroa (God of the sea and fish) highlight the interconnectedness of the two domains, the ngahere and the moana (ocean/sea). This distinguishing characteristic is visible in the landscape of Te Tai Tokerau, where the ocean and the forest are interlinked. In some tribal traditions, kauri and tohorā (whale), giants of the land and sea, are kin, tuakana-teina (senior and junior siblings) who look after each other (Te Hiku Media, 2018). According to pūrākau, kauri and the tohorā exchanged skins, the scale-like texture of the bark on the kauri was gifted by the tohorā, and the kauri gifted the tohorā their skin and blubber for protection from outside sources; these characteristics may be observed in the whale's ambergris, which remarkably resembles kauri gum. Kaumātua Hori Parata, an expert in traditional mātauranga about whale stranding, indicates that the increase in tohorā or parāoa (whales) strandings are a sign that tohorā are unwell in the ocean just as kauri are suffering from kauri dieback disease on the land (Epiha, 2017). Both the tohorā and kauri are impacted by human exploitation of the landscape, ocean, and environment.

Deforestation: Kauri milling and gum digging in Te Tai Tokerau

In the 1820s, kauri milling began in Aotearoa; kauri timber was used extensively in the shipbuilding industry (sailing ships) and for residential houses. It was also shipped internationally to Sydney, Australia, and San Francisco, California (Orwin, 2007). Milling was prolific during the 1800s and peaked in 1910. By then, only small patches of kauri forests remained. When kauri started to deplete, the kauri gum industry boomed, particularly in the Far North from 1870–1920. Workers, predominantly from the Dalmatian Coast (former Yugoslavia now known as Croatia), came to Aotearoa to work in the gum fields forming close relationships alongside local Māori in the Far North and were called Tararā, referring to their fast pace of talking (McNeill, 1991; Walrond, 2007). Gum was exported internationally to make varnishes (both oil-based and spirit-based) and linoleum (Orwin, 2007). After 100 years of sustained milling, most of the kauri population in Te Tai Tokerau was destroyed, and over 95% of the original kauri forests are now decimated (Lewis et al., 2019). Milling of state forests slowed and eventually stopped in the year 1985 with the recognition of the significance of the kauri by Māori and Pākehā (New Zealand Europeans) and new laws enacted to increase protection for kauri (Boswijk, 2010).

Impact on landscape and people

Widespread exploitation of the whenua and mass extraction of kauri mirrored rapid confiscation of land from Māori custodians. Te Tiriti o Waitangi/The Treaty of Waitangi, signed in 1840 by the British Crown and many Māori chiefs, reaffirmed Māori tino rangatiranga (absolute sovereignty and authority, self-determination) over their taonga (treasures, prized possessions), including lands, waterways, flora, and fauna, tikanga, mātauranga, and hauora (health and wellbeing). But the crown subsequently breached the provisions of Te Tiriti (Orange, 2015; Walker, 2004). Land had high economic and political value to the Crown, which stole it from Māori through warfare, legislation and dubious land sales to then sell on, grant or lease to settlers from Britain (Walker, 2004). Consequently, Māori land 'ownership' decreased from 90% in 1840 to 4% in Te Ika a Māui, the North Island, by the year 2000 (Orange, 2015). In Te Waipounamu, the South Island, 34.5 million acres, the land was acquired by the crown through fraud and theft (O'Reagan et al., 2006). Te Tai Tokerau iwi and hapū each have their own stories and experiences of colonisation (see Ngāpuhi Speaks, Healy et al., 2012) that are a source of immense emotional and spiritual pain (Ngakuru et al., 2010).

Intensive urban migration occurred from the 1940s–1950s onwards; Māori moved to the cities where there was a demand for a labour workforce, working for low wages in the colonial economy (Walker, 2004). The displacement and forced alienation of tāngata whenua from their ancestral homelands, coupled with the experiences of oppression, forced assimilation, denigration of tikanga and mātauranga and racism, had a profoundly detrimental impact on Māori, leading to impoverishment across all vital components of hauora (Durie, 2012; Moewaka-

Barnes & McCreanor, 2019; Reid & Robson 2007). Negative stereotypes and deficit discourses of Māori persist today, alongside feelings of inadequacy associated with being Māori and 'disconnected' from hau kāinga (homelands), whenua, te reo (Māori language), and tikanga. Despite these perceptions, Māori maintain enduring threads of connection with their whakapapa (Gilchrist, 2017). Māori based in urban and rural areas are now rebuilding their relationship with the whenua and the taiao while also reclaiming mātauranga, pūrākau and distinctive iwi and hapū narratives.

Mauri and hauora and their relationship to the ngahere

Mauri is defined as the vital essence, life force, expression of mana atua (mana, sacredness derived from atua), life principle or the essential quality and vitality of a being or entity (Marsden, 2003; New Zealand Māori Language Commission, 2008; Moorfield, 2011). Mauri is dynamic and present in all living things and can also be instilled into inanimate objects. By extension, the ngahere and rākau are imbued with their own mauri, characterised by their unique qualities, the land and microclimate they grow in, and the condition of the ecosystem (Hakaraia, 2019). If there is an imbalance in the whenua and environment, it will influence the mauri and the rākau and ngahere within it. From a mātauranga Māori perspective, the spread of pathogens or ngāngara, such as kauri dieback, indicate the mauri of the environment is compromised (Awatere et al., 2021; Chetham & Shortland, 2013). Humans have the potential to gain hauora from the mauri of the ngahere, and we can affect it through exploitation, pollution, and disregard for the mana (a spiritually and socially contextualised notion of power, associated with the concept of tapu) and tapu (sacred state, sacredness, sanctity) of the environment. Equally, we can uplift the mauri and hauora of the ngahere through caring actions.

Kaitiakitanga: Protection of the ngahere

Kaitiakitanga (sustainable resource management) safeguards the mana, tapu, and mauri of the taiao. According to whakapapa, te ira tangata (humankind) is progeny to ira atua (atua realm). Thus, the whakapapa relational framework provides a template for ethical interaction and care for the environment as atua are tuākana (senior) to people (Stewart, 2021). In the current forest management for kauri dieback, there has been significant opposition to strategies such as rāhui (temporary ritual prohibition, closed season, a conservation measure) to prevent the spread of kauri dieback, a lack of respect for mātauranga and knowledge holders, as well as a lack of recognition of rangatiratanga and authority for hapū and iwi to make changes at local and regional levels (Lambert et al., 2018, Lambert & Mark-Shadbolt, 2021). These factors have led to missed opportunities for improved biosecurity outcomes. Despite this, many iwi and rōpū (groups) continue to maintain active kaitiaki strategies, implementing innovative solutions from mātauranga Māori and western science (Lewis et al., 2019; Manaaki Landcare, 2020).

Whenua-/land-based healing

Moewaka-Barnes & McCreanor (2019) proposed the concept of Tangata Whenua, Tangata Ora, denoting the health of land and people. This understanding recognises that whenua is an underlying determinant of healing, health, and wellbeing for people and the environment. For Māori, many forms of healing and maintaining hauora are land and taiao-based (Mark et al., 2022). Maramataka, the environmental calendar system, was developed based on observing patterns according to the phases of the moon. Living by the maramataka involves syncing human activities with observable tohu (signs) within the taiao, land, forests, bird life, waterways, the ocean, and celestial spheres. Maramataka can be viewed as a hauora model informing everyday life activities such as harvesting and gathering food, physical activity, and restorative practices with corresponding phases of the moon (Makiha, 2019; Rakena, 2020; Solomon & Peach, 2020). The renaissance of the maramataka in recent times has helped to shape the curriculum for Kura (schools) in Te Tai Tokerau, increasing opportunities for immersion in the taiao as a place of learning and wellbeing (Rakena, 2020; Te Ao Māori News, 2021; Te Hiku Media, 2022). Land-centred activities such as māra kai/mahinga kai (gardening) have obvious practical benefits and intrinsically promote health, bringing communities together, enabling whanaungatanga (building and maintaining relationships), reaffirming identity, and connection to whenua while reaping the benefits of harvesting kai (food) grown from the land (Hond et al., 2019). These systems of hauora demonstrate the value of sustainable, localised mātauranga based on the taiao.

Mātauranga Māori

Whakapapa narratives of tūpuna of Te Tai Tokerau show that they were ‘tenacious, determined, entrepreneurial, competitive, peacemakers, political, navigators, explorers, forward-thinking, tactical, and innovative’ (Webber & O’Connor, 2019, p. 6). The characteristics of the iwi and hapū of Te Tai Tokerau mirror the environments that they come from; their stories are part of the landscape. Thus, retelling their narratives strengthens their identity and connection to the environment.

Mātauranga Māori in the form of pūrākau, kōrero tuku iho, waiata (songs), mōteatea (chants), haka (ritualistic, choreographed synchronising of body movements and chanting performed with vigorous energy) and whakataukī (significant saying, proverb, aphorism) were often derived from the environment and were developed to record history and transmit knowledge. Narratives about atua also provide an Indigenous model to understand human behaviour and phenomena we observe in our environments (Kopua et al., 2020). As Kapa-Kingi puts it, ‘kōrero tuku iho are our tūpuna speaking to us across worlds and generations’ (2022a, paragraph 1). Oratory is an exultant skill for Māori, and oral knowledge forms, alongside the creative arts, use memorable and meaningful stories as a deliberate and sophisticated means of inscribing mātauranga into hearts,

bodies, minds and wairua. According to Mataira, 'Māori song and oration have a propensity to elucidate important life events in a way that transcends experience' (2000, p. 1). Literature supports the wide spectrum of hauora benefits of waiata and kapa haka (Māori performing arts) (Emery et al., 2015; Hollands et al., 2015; Pihama et al., 2014; Sheehan, 2017; Smith, 2017; Wirihana & Smith, 2019; Yates-Smith, 2019;). Mātauranga is passed on using dynamic methods in formal settings and informal contexts through experiential learning (Mahuika, 2020; Royal, 2011; Sadler, 2007). New technologies are embraced as an innovative method of intergenerational storytelling and harnessing the inherent creativity of Māori. This is exemplified in the retelling of ancient pūrākau about the formation of the unique geological landscape of Te Au Warawawara in the tribal area of Te Rarawa using virtual reality (Reihana et al., 2019).

Indigenous, relational forms of teaching and learning based on whanaungatanga, ako (teaching and learning), and tuākana-teina (senior-junior reciprocal relationships) are a feature of successful taiao-based science initiatives and programmes in Te Tai Tokerau (Moewaka-Barnes et al., 2019). Meaningful engagement with hauora activities is evident when Māori values, beliefs, practices and mātauranga are centred in programmes that connect Māori to the environment (Warbrick et al., 2016). A recent survey indicates that Māori are committed to a future that prioritises social cohesiveness, manaakitanga (respect/the process of respecting someone's mana by support, care, generosity, hospitality) and protecting the taiao (environment) (Houkamau et al., 2021), just as our tūpuna did before us. Mātauranga Māori offers solutions that are uniquely developed and refined within the local taiao (Penetito, 2009), with immense potential to create transformation in the way we understand and work with the taiao to address the pressing environmental concerns facing our taonga in Aotearoa, New Zealand.

The current research is part of a broader project, 'He taonga kē te ngahere' – the native forest is an exquisite treasure. It aims to capture the diverse realities and understandings of Māori in relation to te taiao, ngahere and taonga species to illuminate the underlying drivers, enablers, and disablers of engagement with the wellbeing of taonga species, ngahere and te taiao. This research project specifically focused on understanding the value and meaning Māori in Te Tai Tokerau give to te taiao and kauri. In doing so, this project provides an Indigenous Māori psychological perspective on the biodiversity space in Aotearoa.

Methodology

Grounded in Kaupapa Māori principles, this research prioritised mātauranga of whānau, hapū and iwi from Te Tai Tokerau and Te Hiku o Te Ika in Northland and the Far North (Smith, 2012). Principles from Kaupapa Māori research informed the design and approach to the research, including whakawhanaungatanga, building on existing whakapapa relationships and networks and tino rangatiratanga, the importance of a Māori philosophical base to gather kōrero (conversations, discussions, oral information, or knowledge) and interpret meaning through a

Māori worldview. This project was addressed with these two guiding principles due to the nature of the research, the discussion of taonga, and the significance of safeguarding the mātauranga communicated via whanaungatanga connections between whānau participants and the first author (Pikihuia Pomare). According to Braun & Clark (2019), qualitative techniques view information as contextual and call for researcher reflexivity to situate the study. I (Pikihuia) will briefly describe my background here to provide some context for how the knowledge in this work was generated and framed. I am from the Hokianga region in Te Tai Tokerau; my hapū are Ngāti Manawa in Panguru and Te Hikutū in Whirinaki. I lived in Koutu Hokianga until I was six and then moved to Tāmaki Makaurau, Auckland City. Therefore, I can be considered both an insider and an outsider in this research.

Design

An exploratory qualitative design with wānanga was used to collect the detailed, rich data required to address the research questions. Mātauranga gathered in wānanga is not easily gained through reading written texts or widely accessible in published materials online or elsewhere; for this reason, it is important to respect the integrity and sacredness of the mātauranga that is shared in research. Wānanga has been described as an all-encompassing method that has been utilised tūpuna for generations to develop and retain knowledge (Mahuika & Mahuika, 2020; Royal, 2011; Sadler, 2007). Utilising all our consciousness' creative potential, it involves creating knowledge by way of dynamic interactions (Mahuika & Mahuika, 2020; Royal, 2011; Spiller, 2020; Sadler, 2007; Sadler, 2014). Wānanga can be a collective activity including discussions with groups of people, one-on-one kōrero, and interactions with the taiao such as rākau, whenua, moana and waterways. Wānanga can also occur internally, enabling access to higher knowledge through focused attention and contemplation by connecting with perceptive sensory systems, mauri and wairua.

Pūrākau was another methodology used in this project (Lee-Morgan, 2019), where Māori understandings of phenomena and human behaviour are informed and interpreted from this base. Pūrākau refers to both narratives and methodology used, applying an Indigenous understanding to kōrero shared by participants. According to Lee-Morgan (2019), pūrākau are inherently relational and have more significance when shared with other pūrākau; as a result, the variety of narratives creates a rich and nuanced portrayal of diverse realities of participants. Personal or specific narratives can be used to contextualise and make meaning by relating back to creation narratives or iwi and hapū whakapapa narratives.

Method

We sought views from whānau participants who culturally identified as Māori from Te Tai Tokerau. Wānanga were held in Hokianga, Te Hiku o Te Ika and Waipoua Forest with ten whānau participants. Participants included six wāhine (women) and four tāne (men) and ranged in age from 18 years old to 87 years old, rangatahi

(youth) to kaumātua (elderly knowledge holders). All whānau participants were interviewed in Northland and identified with a variety of hapū and iwi across Te Tai Tokerau, signifying shared tribal whakapapa, knowledge traditions, practices, and colonisation histories but also uniqueness between and within takiwā (regions), iwi and hapū. Whānau participants came from a range of occupational statuses (one student, seven in paid employment, one not in paid employment and one retired). All ten whānau participants were rural residents. Most of the participants chose to be named with their kōrero. Other participants' names and specific identity details were anonymised. Ethical approval was obtained from Massey University Human Ethics committee in 2020, and ethical guidelines for Kaupapa Māori research were engaged with throughout the study (Smith, 2012).

Wānanga ranged from 60-120 minutes and included tikanga such as karakia (incantation/prayer), and whakawhangaungatanga. The wānanga were in both te reo Māori and English, allowing participants to switch between both languages and express themselves in whichever language was appropriate to the kaupapa (topic) we discussed. After the wānanga, kai was shared to whakanoa (remove the tapu), acknowledging the mātauranga that was shared during the wānanga and transitioning back into ordinary, everyday kōrero. Wānanga were conducted by Pikihuia at the kāinga (homes) of participants in Te Tai Tokerau and included hīkoi (walking) on whenua and in the ngahere, whakapapa narratives, and pūrākau. Wānanga were audiotaped and transcribed.

We looked at the meanings that whānau participants assigned to the taiao, ngahere, and kauri in Te Tai Tokerau based on a shared understanding of the concepts of pūrākau and whakapapa. The process of analysis and interpretation shared similarities with reflective thematic analysis (Braun & Clark, 2019), however, was based on Māori epistemological and ontological pūrākau, whakapapa and wānanga frameworks (Lee-Morgan, 2019; Sadler, 2007). Transcripts were read and re-read to familiarise myself (Pikihuia) and identify whakaaro (thoughts, ideas) in the kōrero. After I (Pikihuia) became familiar with the kōrero, initial whakaaro pertaining to the taiao, ngahere, Kauri and hauora that were generated within the kōrero and whakaaro were then expanded into broader kaupapa (themes) through a wānanga iteration process. The themes and subthemes were developed by Pikihuia from Mātauranga Māori basis to conceptualise the value and meaning Māori give to the ngahere and kauri. Themes were refined through a process of kōrero with other researchers to confirm validity within a Kaupapa Māori framework. Where te reo Māori words were used by participants in the kōrero or 'data excerpts' below, bracketed definitions in English have been provided.

A storymap was developed based on the findings of this research.[1] The storymap includes stories, interactive maps, photos of participants and the ngahere, videos, artwork, pūoro (Māori music), karakia (chants) and an audio excerpt of an interview with a kaumātua. (To view this storymap, *The Vital Essence & Life Force of the Kauri and the Ngahere*, see Pomare, 2021).

Results

The findings are organised as four key kaupapa or themes 1) ūkaipō, a place of sustenance and renewal; 2) E kore te kauri e tū mokemoke, a holistic approach to caring for the ngahere; 3) barriers to caring for the ngahere and kauri dieback disease; and 4) transmission of mātauranga, the importance of sharing mātauranga.

Ūkaipō: The ngahere as a place of sustenance and renewal

Whānau participants described how the ngahere elicited feelings of joy, playfulness, and freedom. The ngahere was a place to spend time with whānau, strengthening bonds between the generations, from parents to children and grandparents to mokopuna (grandchildren). Kaumātua (elders) talked about the myriad of benefits the ngahere and whenua provide for our hauora.
The ngahere was a place to connect with whānau:

> When we were kids ... dad always knew that these are the special things for us to come to.... When you're kids, you sort of take it for granted, or it's just part of the bush the ngahere here, but it was a special day that we came up to walk to the kauri, and he's made sure that all of us have come up here, all of his tamariki, all of his mokopuna have all come up to mihi (greet) to the kauri. (Kohu Atatu Hakaraia)

By making this a special trip, in time, tamariki (children) recognised the mana and significance of the kauri. Whānau rituals built whanaungatanga within the whānau but also with the ngahere. The ngahere is also recognised as a place that is full of rongoā, or natural remedies for every ailment.

> Nō te whenua. Kei konei ngā rongoā. Ahakoa pēhea, kei te ngahere.... Kei reira tō tātou chemist…. E kōrero nei tātou, haere ki te chemist te tiki a rongoā, kei konei kē, nē. Ko tātou, me tiaki tātou o tātou ngahere. (Hinerangi Puru)
> It comes from the land. That is where the rongoā – the medicines – are. No matter what, no matter the ailment, it is in the forest. That is where our chemist is. We say, go to the chemist to get some rongoā, but it is already right here, isn't it? [...] We must look after our ngahere.

In traditional times, tūpuna had intimate knowledge of all the purposes and roles of each rākau and their correlating medicinal properties that enabled holistic healing of the entire being. Rākau had physical healing properties and worked at rebalancing and correcting the mauri. The ngahere was also a place to return to and rejuvenate, providing a balance to the challenges encountered in daily life.

> We get to come home, we get to go into the bush and do some mahi that's really like, it's soothing, it's hugely massively soothing, you need it, and so there's a balance. It's just, it's just a reset. Realignment. (Taoho Patuawa)

'Doing the mahi,' as mentioned above, refers to hands-on work within the ngahere environment. Being in the ngahere was particularly important for whānau engaged in environmental work at hapū and iwi levels working to bring about systemic change. In addition to the physiological benefits of being in the ngahere, participants described a deeper level of connection to the whenua and ngahere:

> Te ūkaipō and that being the mother sustenance, but also, your home, that sense of the place that you feel that attachment to, that kind of really entrenched connection, that deep connection, and that soothing as well. So that's how, that's how dad would describe this place to us as well as our own ūkaipō. (Meri)

The ūkaipō represents the feeling of contentment and safety felt when one is nourished by their mother. Similarly, returning to the whenua and ngahere was like returning home to a place where there was a felt sense of knowing and familiarity on a wairua level that allowed whānau to feel at ease.

> It's comforting and makes you feel good, just like an Aunty or Nan would. (Rangatahi)

> It's also a way of connecting to your tūpuna there's these are the lands that, they've been on there. They've lived their lives on. (Meri)

The experience of being in the ngahere can be likened to an Indigenous form of meditation and mindfulness but from a distinctively Indigenous Māori worldview and understanding, steeped in wairuatanga and acknowledgement of whakapapa.

> The visceral experience of being in the ngahere: it's very connected to the senses, but it's also that kind of spiritual connection as well…. You could talk about mindfulness. You could talk about … this, that, the other, but I think it goes beyond that for Māori people. It's not as simple as being present in the moment without any judgments. It's not that; it's a connection to your whakapapa and your tūpuna through a place and through a space. (Meri)

The whenua and ngahere were places where many generations of ancestors fostered a close relationship, and therefore being on the whenua and in the ngahere meant that it was easier to connect with tūpuna, providing a feeling of belonging and inspiration for whānau in their lives.

Another whānau participant described a sense of pride and achievement climbing their maunga (mountain), a place of significance and identity, recited in pepeha (tribal saying and affiliation to the environment), but the embodied experience of climbing their maunga and being in the ngahere had even more meaning:

> There’s just a different feeling going into the ngahere; you can definitely feel that when you see kukupā (Native New Zealand pigeons) are still up north here. You can definitely feel the wairua in the ngahere ... so there’s times we’d climbed up Maunga Taniwha, and we felt proud of ourselves to say we are one of a small group of people that have been up here, so we should be proud of that. And we say that to each other when we’re going up, especially like after walking up a steep maunga. Yeah, and then you’ll always remember, remember that time we went up. (Wikatana Popata)

Tamariki that had difficulties within the restrictions and confounds of a classroom often thrived within the taiao. Two kaiako (teachers) described observing tamariki when they are in the ngahere:

> Rangimārie:… haututū i roto i te akomanga, engari ka mauria ki te ngahere, ko tērā tō rātou tino kai.
> Wikatana: Āe, i te wā ka tū mātou ki te kai ka timata rātou te piki i ngā rakau, arā, pai tērā.
> Rangimarie: Ki roto i te akomanga tapawhā. Engari i roto te akomanga o te taiao he maha ngā hua nē. Pērā i a [tamaiti].
> Wikatana: Tino. Tau tōna mauri nē. Ka pai ki a ia te tiki mai he rākau me te āta titiro,
> Rangimarie: Engari i roto i te ao o te kura, kaua e pā i tērā, noho, pōkai o ringa. Oh I te marae rānei me noho, whakarongo, engari i roto i te taiao... he tamaiti tirotiro haere i ngā wā katoa. Ko ia te mea ka kite i ngā momo manu.
>
> Yes, [some kids are] mischievous inside the classroom, but, when we take them to the ngahere, they thrive. When we stop to eat, they climb the trees, it’s good. [It’s difficult] in the classroom with four walls, but, in the learning environment of the taiao, there are many benefits. Like [name of child]: his mauri [energy] really settles. He likes to get a branch of a tree and really study it. But, in school, [it’s like,] ‘don’t touch that, sit down, fold your arms.’ And, at the marae, you must sit and listen. But, in the taiao, they look around all the time; they notice all the different kinds of birds. (Rangimarie Pomare)

When tamariki had the freedom to explore and follow their own interests in the ngahere, their mauri shifted into a more settled state, allowing learning to take place naturally.

E kore te kauri e tū mokemoke: A holistic approach to caring for the ngahere

The health of the ngahere was integral to the health of the kauri, just as the kauri was integral to the health of the ngahere. The ngahere was full of life and diversity, all of which was needed for a ngahere to thrive. Mature kauri trees provide

whakaruruhau or shelter to other rākau, birds, and living organisms. In turn, those living things contribute to the health of the environment the kauri grows in.

> E kore te kauri e tū mokemoke…. So, in other words, the kauri doesn't stand alone. The importance of those kauri associates, the whānau, they help keep the kauri anchored…. the root system has to go out and interweaves with those kauri associates. […] So really important that we don't just focus on the kauri; we focus on the whole thing. So we have a whole forest approach to our thinking. (Snow Taoho Tane)

Whanaungatanga, building, maintaining, and strengthening connections and relationships was an important value to Māori that extended to the relationship with the ngahere and within the ngahere. Whānau, hapū and iwi actively engaged in kauri protection work emphasised the importance of the whole forest rather than the kauri as one rākau that was visibly threatened with the kauri dieback pathogen.

> Some people might look at a tree and be like, that's a tree. But I think we look at our rākau, and we know it means so much more.... You can't look at the health of kauri alone; it needs to be in conjunction with the rest of the forest. Because it is a whānau, they are connected.... [T]rees communicate through the oxygen in their roots. And so they are a really robust, really sophisticated specimen. They know what they're doing. Probably a lot more than we know.... When you think about mauri, everything's connected ... all the bits that make up the forest are connected. And so we may need to be thinking about how we nurture one. We need to be thinking about how we can actually nurture the ngahere as a whole. (Meri)

Every rākau had its own unique mauri. The mauri of the rākau provided information about the state of health and was comprised of and influenced by the mauri of the surrounding environment. By attending to and nurturing the whole ngahere, there was potential to positively impact on all the rākau within that ngahere, including those that were compromised, even with a holistic approach to caring for the ngahere, iwi such as Te Roroa whose tribal lands are the Waipoua Forest focussed on being active in protecting the kauri and managing threats.

> A forest health plan, which basically assesses all of the threats that we have ... you start from sort of the basis of what are the values that we're trying to protect? What are the threats to those values? And what are the management interventions that we can do in order to turn that around? And once you sort of understand what that is, how do we monitor the response to our interventions to show that we're making a difference, to show that we are achieving a state of no decline but an increase in applying all the tools we need to do so? (Taoho Patuawa)

Te Roroa iwi employed kaimahi or workers such as kauri protection ambassadors and kauri Ora teams to educate the public about kauri dieback, sharing pūrākau about kauri. Iwi and hapū were engaged with scientists from around Aotearoa|New Zealand, so their interventions were informed by both western science and their own mātauranga and infection control measures were part of the kauri dieback response. This ensured they addressed a range of threats that threaten the health of the ngahere.

Barriers to caring for the forest and kauri dieback

Whānau identified barriers that interfered with Māori connection to the ngahere, including colonisation, dispossession of whenua and deforestation, access difficulties due to private ownership of whenua, extrication of tāngata whenua from their whenua and physical distance from whenua. Limited investment in resources and inequities in Te Tai Tokerau further exacerbated these factors creating barriers for Māori to access and engage with te taiao.

> Rangimarie: I think that, once a lot of whānau are like not focused on day-to-day survival, then these things will become more important.... But, then, actually, it's a part of the rongoā [cure] too.
> Wikatana: To go into the ngahere?
> Rangimarie: Yeah, or to like just be more conscious of, or to include it in your lifestyle like, yes, even though you may be dealing with really bad stuff in your kāinga [home], like, these are some things that'll be.
> Wikatana: Helpful to your wairua [spirit].
> Rangimarie: Yeah, helpful and, like, good for your kids.
> Wikatana: They probably just don't even know about it either, eh, don't even know that there's a – he mea rongoā ki te ngahere (there is healing in the ngahere).
> Rangimarie: The ngahere's over there, and they're over here, like, they're not….

Some whānau lived in precarious realities due to socioeconomic inequity in Te Tai Tokerau and Te Hiku o Te Ika. Their focus was on day-to-day survival and their immediate physical needs. This meant there was limited capacity to engage with the ngahere in ways that could potentially benefit their hauora and the hauora of their whānau. Another consequence of colonisation was the denigration of mātauranga Māori, including mātauranga about the taiao and ngahere, and the disruption of intergenerational transfer of mātauranga. As this participant indicates, our hauora is inextricably linked to Papatūānuku:

> On a spiritual level, that's possibly an indication that Papatūānuku needs some healing; there's too much exploitation; there is too much individualistic cultures coming in and saying that we can exploit this when we know that actually, the health of our people is very contingent on the health of our whenua, and our ngahere. (Meri)

The presence of disease and pathogens in rākau, such as kauri dieback, reflect an imbalance within te ao wairua (the spiritual world) caused by a shift from a reciprocal and caring relationship between people and Papatūānuku to a relationship that was indifferent or detached. This separation between humans and Papatūānuku then allowed the whenua to be viewed as a commodity where resources were infinitely extracted without consideration of the implications for the ngahere, whenua, the wider taiao that we occupy and draw our sustenance and hauora from.

> I was speaking to one of the cuzzies. She sees the trees as the embodiment of her tūpuna and how the threat of illness or the illness itself [is] like the process of grief – like if it was your baby or whānau being ill. (Meri)

In contrast to being separated, the sense of connectedness with kauri underscored the relationship between whānau who came from Waipoua with rākau that were also ancestors and whānau members to them. When kauri fell ill with kauri dieback, they experienced grief, showing the depth of the connection with rākau rangatira, who were a symbol of identity in relation to their ngahere.

Kauri dieback is one of many incursions that threatened the health of the ngahere.

> I think Māori people, in general, respond really well with these threats. Because, unfortunately, we've been desensitised to always being trauma, and they're always being a threat. But that's when we band together.... In response to that, our whānau have come home, and our whānau are working together to heal that, to heal that space. (Meri)

Kotahitanga, or working together in collaboration, was noted as a key strength for iwi working to protect the health of the ngahere. For Māori, responding well to threats was developed over time due in part to the experience of trauma from colonisation. The strong call to protect their whenua, particularly in the Waipoua Forest, has led to more whānau returning home, contributing their skills for the betterment of their whānau, hapū and iwi.

While iwi have mobilised to respond to a multitude of incursions, other challenges, such as the general public's sense of entitlement to recreation in the ngahere, despite the threat of spreading disease, was a barrier to protection and conservation efforts.

> One of our biggest problems is the state highway right through the middle of the forest. Okay, so that brings with it a significant problem, which is humans, because of human behaviour…. It's that sense of entitlement. (Taoho Patuawa)

The accessibility of the ngahere to the public came with an increased risk of spreading kauri dieback requiring additional resources to ensure the public complied with guidelines and were educated about precautions such as using wash stations for shoes and keeping to designated tracks to minimise the spread of kauri dieback. However, some people prioritised recreation in the ngahere over the protection of the ngahere from further harm, often ignoring rāhui or opposing restrictions to access.

For some iwi in Te Tai Tokerau, the Treaty settlement process offered a platform to acknowledge the importance of recognising iwi and hapū in conservation legislation, governance, and management. Current issues and threats to the ngahere required significant investment and accountability to remedy the issues created by the Crown and Government's disregard of the Treaty and the direct consequences for hapū and iwi who are mana whenua and kaitiaki of those places.

> We can't do it in isolation. We need to have those productive relationships. (Taoho Snow Tane)

Positive conservation initiatives that recognised rangatiratanga and the provisions of the Treaty provided hope for transforming the current structures to better reflect the values and aspirations of iwi and hapū.

Transmission of mātauranga: The importance of sharing mātauranga

Sharing mātauranga provided whānau with wellbeing. Māori used creative forms of mātauranga that could be accessible to whānau in contemporary contexts.

> He pai ngā momo wāhanga o Tāne. Pērā ki a Tāne, ahakoa ko Tāne Mahuta, ka huri ia ki ngā momo Tāne katoa. Tāne te Waiora, Tane Toko i te Rangi, Tāne `Hakapiripiri. Engari koia te mea matua, nē? [Kei a ia ngā momo] Pūmanawa rerekē. (Rangimarie Pomare)
> I like the different forms of Tāne, like Tāne, even though he is Tāne Mahuta, he changes into the various kinds or aspects of Tāne. Tāne te Waiora [Life giving waters of Tāne who provides health and wellbeing], Tane Toko i te Rangi [Tāne who climbed the heavens[, Tāne Hakapiripiri [Tāne who gathers people and offers shelter]. But Tane [Mahuta] is the principal Atua. He has many different attributes and gifts.

According to pūrākau, Tāne Mahuta was personified as the atua of the forest. Tane had many other forms and ways to provide life and wellbeing to people that we can draw on in our human experience. This mātauranga in pūrākau demonstrates how the attributes and various forms of Tāne each have their own expressions within overarching tikanga and are epitomised in everyday practices that create wellbeing.

These intrinsic pūmanawa (inherent qualities) are also within us as people who descend from Tāne and provide inspiration and guidance, depending on the

circumstance, such as gathering people together for a common purpose, overcoming challenges and the pursuit of knowledge. Historically, these forms of locally derived mātauranga about the environment were not valued in 'mainstream' schooling systems, as this participant indicated:

> I don't think they [teachers/education system] really valued, well, they didn't, science in our own environment. Even though I was coming up here [to the kauri] and had this curiosity about it…. It wasn't part of my mainstream education … except that I could of when it was right here. I could have pursued this scientifically or whatever. [Kohu Atatū Hakaraia]

Consequently, many Māori are reclaiming this mātauranga, actively seeking out opportunities to learn kōrero tuku iho and pūrākau that have long been suppressed and ignored in education and in the colonial-settler society. Revitalisation and development of mātauranga and Māori forms of transferring and retaining knowledge were effective for tamariki, rangatahi, and adults who were learning new information or re-remembering intergenerational knowledge. Mātauranga Māori and taiao initiatives like Noho Taiao, Tūhura Papatūānuku, and other similar programmes developed by Te Rarawa helped rangatahi to learn kōrero tuku iho and tribal specific pūrākau to connect back to the taiao, significant places and tūpuna.

> I'm all about the multi-sensory learning. I don't just want to be lectured at or just writing. I just believe through waiata and music, and mum says, that's my gift. […] My gift is waiata, so that's what I try and do when I am at noho taiao. And we had the Geo Camps last year. I used Papa Rereata's whakapapa o te wai. I turned it into a waiata, like a Hawaiian style … the whakapapa of rocks: 'we will rock you' tune to the whakapapa of rocks. (Selena Bercic)

Waiata, with catchy and memorable tunes, enabled rangatahi and Māori generally to engage with mātauranga in a dynamic way, moving away from a didactic form of educating to a captivating technique, aligning with the value of ako. It also recognises the importance of harnessing the skills and talents of the leaders within hapū and communities who can transform information gathered from mātanga and scientists who attend programmes into a form that resonates with rangatahi. Iwi and hapū-based learning strengthened and reinforced identity and belonging.

Discussion

This research sought to gather mātauranga pertaining to kauri, but from a holistic Māori worldview, one rākau species cannot be separated from its immediate environment, the ngahere and taiao. Thus, this research encompassed the broader ecosystem of the kauri with a view to deepening our understandings of the value and meaning of kauri and the ngahere to whānau in Te Tai Tokerau. Even though knowledge about kauri, the ngahere and taiao are interrelated, we concentrated the

analysis on four kaupapa or themes to facilitate communication, 1) ūkaipō, a place of sustenance and renewal; 2) E kore te kauri e tū mokemoke, a holistic approach to caring for the ngahere; 3) barriers to caring for the forest and kauri dieback disease; and 4) transmission of mātauranga.

Whānau participants in this study spoke about the immense value of the ngahere, as a place where they received nourishment. The concept of ūkaipō – the kai and nourishment received through a mother's breast milk, was symbolic of the depth of the relationship between people and the whenua and ngahere. Ūkaipō was a place of safety, contentment, and rejuvenation (Dell, 2021). The same Indigenous philosophy was also reflected in the Awa tupuna Act for Whanganui River, which states that the awa is the source of physical and spiritual sustenance supporting the health and wellbeing of iwi, hapū and other communities of the river (Te Awa Tupuna Act, 2017). Whenua, and everything that springs from it, hold these elements of wellbeing for Māori.

Iwi and hapū led education initiatives for rangatahi such as Kura Taiao, Noho Taiao, Tūhura Papatūānuku, and Te Karanga a Tāne Mahuta, run by Te Rarawa and other iwi in Te Tai Tokerau, created a space for experiential connection with the taiao, centring the importance of the taiao as a place and space for transformation to occur (Moewaka-Barnes et al., 2019; Reihana et al., 2021). The taiao or ngahere environment worked well for tamariki who had difficulties in restrictive classroom settings as it helped them engage all their senses and settle their mauri. Being in the ngahere was also described as an Indigenous Māori form of mindfulness meditation, connected to the senses, but, for Māori, it held a deeper meaning on a wairua level as Meri articulated it 'a connection to your whakapapa and your tūpuna through a place and through a space.' Reinforcing the wairuatanga element of the connection between Māori and the taiao (Apiti et al., 2022; Tassell-Matamua et al., 2021). Similarly, in research by Kingi and colleagues (2017), rangatahi Māori practised a uniquely Māori form of mindfulness by going to places in the taiao as a way of alleviating emotional distress, noting the potency of whakapapa as a way of learning about themselves and their tūrangawaewae. This finding has relevance for health and mental health; being in the ngahere could be encouraged and supported as an Indigenous psychological, therapeutic, and wairua approach for alleviating distress and settling mauri that resonate with Māori. These practices could be used in psychological practice, mental health, therapeutic settings, and as part of the everyday maintenance of health and wellbeing.

While the socioeconomic impact of the dispossession of land is known to a certain extent, the link between the separation of people from the land as the ūkaipō is not often acknowledged. Other research that explored the management of Māori land trusts indicated that Māori had unexpressed anxiety, trauma, and grief caused by permanent disconnection from an intimate relationship with the land that was taken from them (Dell, 2021). This indicates that it is imperative to attend to and heal the psychological and spiritual pain of separation and alienation of Māori from the whenua. The connection back to the whenua, Papatūānuku, is essential to

this work because our identity and whakapapa, past, present and future, are woven into our environment. Whakapapa and pepeha serve as collective identity anchors that firmly establish us in our identity (Kapa Kingi, 2022b). Noho Taiao and other such environmental science initiatives allow rangatahi to live their whakapapa, to know their maunga, awa, and moana named in their pepeha, deepening their connection with these pillars of our shared whakapapa and identity that firmly ground us in who we are. Similar land-based healing programmes in First Nation Indigenous communities have shown a multitude of measurable physical and psychological health benefits (Johnson-Jennings et al., 2020). Moewaka-Barnes & McCreanor (2019) argue for a Tangata Whenua, Tangata Ora framework that actively works towards prioritising manaakitanga and kaitiakitanga of the whenua to enable mutual flourishing humans and part of the taiao.

Whānau participants in this study also reported that kauri were tūpuna, and the kauri dieback illness felt like the same process of grief as though it was a whānau member who was ill. Accordingly, protecting kauri and restoring the health of the ngahere was of great importance to participants in this research. Whānau, hapū, and iwi efforts to restore the health of the Waipoua ngahere have been in response to kauri dieback and other threats that have caused significant devastation to the ngahere. Many whānau returned to ancestral lands to protect the ngahere against these threats, highlighting the value of mahi ngātahi and kotahitanga (working together and unity of purpose). It also demonstrates the ability of Māori to mobilise in the face of threats to taonga, driven by a shared sense of purpose and meaning. Kaimahi, actively working in the ngahere on the ground level, used mātauranga and western science as tools to prevent the spread of kauri dieback (Harcourt et al., 2021). These findings illustrate the importance of iwi and hapū-led responses (Ruru et al., 2017), where Māori have rangatiratanga to set out a forest health plan according to their own goals and aspirations.

The interconnectedness of the ngahere as an interdependent ecosystem was highlighted by participants, encompassing the kauri in a collective understanding and response. While most western scientific approaches have a reductionist focus, Māori philosophy makes sense of phenomena from the inside out, looking from the micro level outwards towards the relationships and wider systems (Durie & Hermansson, 1990). The concept of 'e kore te kauri e tū mokemoke' – the kauri never stands alone, spoke to the importance of looking outwards to the taiao, including humans, living in a symbiotic relationship, where the mauri of all things is connected (Marsden, 2003; Marsden & Henare, 1992). When Māori philosophy and methodology is applied to protecting taonga species, depth and breadth is applied, giving equal value and importance to the micro- (Ngata-Aerengamate, 2020) and macro-facets of the rākau and elements in the taiao. Thus, this research contributes Indigenous knowledge to monitoring biodiversity (Kuru et al., 2021), incorporating and prioritising Māori indicators of health for the kauri and ngahere ecosystem alongside western science perspectives (Lyver et al., 2017).

Pūrākau emphasise the value of environmental preservation, resource management, and conservation for the benefit of both people and the environment (Barclay-Kerr, 2016). Personally relatable pūrākau spark interest, making use of natural oratory skills of Māori that infuse elements of entertainment and humour engaged rangatahi, brought alive with technology such as virtual reality, recounting ancient pūrākau of the ngahere (Reihana et al., 2019). Insights and guidance or hīnātore – glimmers of light and inspiration contained in this mātauranga offer solutions for current challenges and understanding human behaviour (Kopua et al., 2020), to gain a better understanding of the role humans can and do play in the wellbeing of taonga trees like kauri. Narratives can still inspire and direct people now, in the same way that they did in the past (Webber & O'Connor, 2019). As Le Grice et al. (2017) identified, many Māori, even those who may not be deemed as experts in te reo and tikanga Māori, were bearers of mātauranga that can assist us to navigate our modern contexts. This suggests that there is a wider range of mātauranga and lived experiences pertaining to the ngahere and taiao available than may have previously been acknowledged. It also emphasises the significance and relevance of Indigenous knowledge holders and local communities on the ground level, their 'watchfulness' and depth of knowledge about the health of the ngahere (Lambert & Mark-Shadbolt, 2021).

Conclusion

This research illuminates hīnātore, the glimmers of hope and opportunities for change, and the contribution of mātauranga Māori and locally derived Indigenous psychological understandings of these aspirations. Given the devasting impact of the rapid spread of kauri dieback and other current interrelated environmental concerns we are facing, increasing our understandings of the human dimensions of caring for the ngahere is vital. This research indicated that opportunities to restrengthen our connection by being in the taiao produce benefits of whanaungatanga or connectedness, reaffirming whakapapa and identity, thereby revitalising mauri and hauora – of the taiao and of people. While protecting the taiao and the wellbeing of the environment is paramount, it continues to be challenging for many whānau in the current economic climate to experience the benefits of the ngahere. However, the mātauranga described in this research supports the notion that iwi and hapū led initiatives can harness the expertise of the community while simultaneously educating and providing experiences to be on the whenua and in the taiao. Many environmental issues are caused by human activities, which means that finding solutions must also focus on our role and relationship with the taiao. The wellness of Papatūānuku, the kauri, native forest and the wider environment may be improved if we continue to enhance their status by reinstating Indigenous practices, active kaitiakitanga and mātauranga Māori.

Glossary

ako	to teach and to learn
atua	god/gods, deity/deities, supernatural being

haka	ritualistic, choreographed synchronising of body movements, chanting performed with vigorous energy
hapū	kin group, smaller tribe
hauora	breath of life, health, wellbeing
hau kāinga	home, ancestral, and tribal lands
hikoi	walk, hike
hīnātore	glimmers of hope, opportunities for change
hinu	oil, fat
iwi	tribe, nation
kaiako	teacher
kaimahi	workers
kaitiaki	caretakers, custodians
kaitiakitanga	the act of caring for, looking after the natural environment.
kāpia	kauri resin, gum
kapa haka	Māori performing arts.
karakia	incantation, prayer, chant
kaumātua	elder
kaupapa	topic, area of focus, purpose, theme
kauri	Agathis australis: the largest forest tree, found only in the northern North Island, of Aotearoa|New Zealand; it has a large trunk and small, oblong, leathery leaves
korari	flax (Northern dialect)
kōpū	womb, uterus
kōrero	talk, discussion, conversation, information.
kōrero tuku iho	knowledge that is passed down through generations, oral narratives.
kotahitanga	working together, unity of purpose.
kura	schools
kumara	sweet potato
mahi ngātahi	working together
mahinga kai	garden, food harvesting
mana	a spiritually and socially contextualised notion of power
mana whenua	tribal custodians of lands and environs, territorial rights, land jurisdiction
māra kai	garden
maramataka	environmental calendar, traditional lunar calendar
mātauranga Māori	knowledge, wisdom, and practices, education, knowledge, understanding, skill pertaining to Māori, the Indigenous people of New Zealand
maunga	mountain
mauri	vital essence, life force
mokopuna	grandchildren, descendants
mōteatea	chants
ngahere	native forest
ngāngara	bug, pathogen
Papatūānuku	Earth Mother, feminine element
parāoa	whale, whalebone, sperm whale
pepeha	tribal saying and affiliation to the environment

pūmanawa	inherent qualities and gifts
pūrākau	oral narrative
rākau	tree
rākau rangatira	chiefly tree
rangatahi	youth
Ranginui	Sky Father, masculine element
rongoā Māori	healing, plant medicine, remedy
takiwā	region, geographical area
taiao	natural environment
tamariki	children
tāmoko	traditional skin marking, traditional tattoo.
tāne	men
Tāne Mahuta	god of the forest
Tangaroa	god of the sea and fish
Tāngata whenua	people of the land, Indigenous people of Aotearoa|New Zealand
taonga	treasures, prized possessions.
tapu	sacred state, sacredness, sanctity
tārai waka	making traditional single-hulled and double-hulled canoes.
Tararā	person of Yugoslavian or Croatian heritage
te ao mārama	the world of light, enlightenment
Te Hiku o Te Ika	the tail of the fish, also known as the Far North, Northern tip
Te Tai Tokerau	Northland
te reo	the Māori language
tikanga	protocols, practices, doing what is right
tino rangatiratanga	absolute authority, self determination
ohorā	whale, southern right whale
tohu	sign, indication
tohunga	specialist, expert, traditional healing expert, highly knowledgeable person
tuakana	older sibling, leader, a person with more experience
tuākana-teina	reciprocal relationship between a senior and junior or a leader/learner, siblings
tupua/tipua	spirit-being, usually a large being, a being that is feared and/or revered
tūpuna	ancestors
ūkaipō	mother, source of sustenance, real home
wāhine	women
waiata	song, singing
wairua	soul, spirit, spiritual
wānanga	purposeful or deep discussion, deliberation, tribal knowledge
whakaaro	thoughts, ideas
whakairo	carving
whakaruruhau	shelter, protection
whanau	kin group, family, extended family
whanaungatanga	developing, building and maintaining connections and connectedness.
whakanoa	remove tapu or restrictions and make ordinary
whakapapa	genealogical relationships, descent, layers, heritage
whakatauki	saying, proverb, aphorism.

whare	house, home, building.
whenua	land, placenta

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The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Note

1. There is a storymap linked to this article. A storymap is a type of media that combines stories, maps, text, images, videos, artwork, and audio snippets. To view 'The Mauri (Vital Essence & Life-Force) of the Kauri and the Ngahere (Native Forest)' storymap, see Pomare (2021).

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