

**Mana taonga kākahu:**

**Exploring approaches to reconnecting  
taonga kākahu to tangata whenua**

by

Rangituatahi Te Kanawa

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*I dedicate this work to my late parents Tana Tangitehau and Diggeress  
Rangituatahi Te Kanawa and late Grandmother Rangimarie Hetet  
and the late Valerie Carson.*



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## Abstract

The current mission of museums in Aotearoa New Zealand is to reconnect taonga (treasured artefacts) to their tribal descendants, but in most cases, there is no provenance, and many Māori remain alienated from their cultural heritage. Taonga kākahu (treasured textiles) from the pre-European and contact period retain mātauranga Māori (ancestral knowledge), materialise links to Te Ao Māori (the Māori world), whakapapa (genealogy) and reflect a sustainable relationship with Te Taiao (nature). They are the product of intricate weaving skills in the procurement, preparation, and construction of natural materials, including the dying of harakeke fibre (NZ flax) with paru (iron rich mud). The main research question therefore is: How and why should taonga kākahu in museum collections be reconnected with tangata whenua?

This thesis used a range of interdisciplinary qualitative and quantitative methods, including field work, scientific applications such as colour measurements, technical analysis of cloaks and practical weaving samples. Iron rich mud samples were gathered from different geographical locations spread around the North Island and one in the South Island and processed with several tannins that were each scientifically measured for their hue of black. Experimental archaeology produced new insights and interpretations of three case study taonga kākahu. The research aims to revitalize customary techniques and knowledge of dying and weaving, support conservation and display of Māori textiles, and enhance the mana and understanding of these precious taonga.

The data gathered through this research supports the preservation of the fragile dyed black fibre, contributes to the decolonisation of conservation, advocates for greater community access to collections, and argues for enhanced museum display of cloaks through new interpretation of designs. The research has identified material composition and some unique characteristics in the construction of taonga kākahu which explores ways of reconnecting unprovenanced taonga to tangata whenua.



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## Introduction

### Mana Taonga Kākahu

*Aitia te wahine o te pā harakeke*<sup>1</sup>

#### **Introduction: Activating the connection between taonga and tangata whenua**

As a conservator of textiles at the National Museum of New Zealand Te Papa Tongarewa, in the 1980s, I was assigned the task of stabilizing a kaitaka paepaeroa, a Māori cloak, circa 1840, featuring plain foundation and decorative borders. The cloak exhibited the finest craftsmanship of traditional Māori weaving, the intricate work of an old weaving technique dating from the Neolithic period, that twines together spliced threads (whatu/finger pair twining) worked without a loom (Barber 1994, 128, Gelba 2019, 233). The size, regal sheen and intricate make-up reinforced the pride I held for our tupuna (ancestors), and it was truly a privilege to have direct contact with the taonga (treasure), a connection whakapapa (genealogy) (Figure 1). The cloak is imbued with ancestral knowledge, mātauranga Māori, the knowledge of a people which was developed after their arrival at Aotearoa (New Zealand) some 700 years ago and originated in their former Hawaiki (O'Malley 2015, 7). Stabilizing the taonga and drawing upon the tangible and intangible values confirm my Māori identity, however I knew that many Māori did not know about taonga kākahu (Māori clothing) because they had rarely visited museums and, more particularly, because of the impact of colonization that displaced Te Ao Māori (Māori world view), the culture that created taonga kākahu. From this point I was committed to forging a reconnection between Māori cloaks and the people with whom they are intimately associated.<sup>2</sup>

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<sup>1</sup> “Marry the woman of the flax cultivation.” *Pā Harakeke* is a metaphor for raising a family, hence, marry a woman capable of rearing a family. The saying may also be used to refer to a woman skilled at making mats and garments as well as being stable and industrious. Hirini M. Mead, Neil Grove, *Nga Pepeha a nga Tipuna* (Wellington: Victoria University Press 2002), 15.



Figure 1. Kaitaka paepaeroa. Courtesy, Te Papa Tongarewa.

This research explores a range of approaches, including field work, kaupapa and matāuranga Māori, museum conservation and scientific materials analysis, to reconnect with Māori textiles. It is culturally, politically, and ethically important to find out where taonga come from and by whom and how they were made.

As the well-known waiata says:'

Hutia te rito

Hutia te rito o te harakeke

Kei hea te komako e kō

Kī mai ki ahau

He aha te mea nui o te ao

Māku e kī atu

He tangata, he tangata,

‘He tangata, hei!

If you remove the heart of the flax bush

Where will the bell bird sing?

If you ask me, what is the most important thing

In this world, I would reply

It is people, it is people

It is people!

The objective of this research is to understand the ancient knowledge of weaving kakāhu and acknowledge mātauranga (Māori knowledge) to enable a connection of taonga kākahu to people and to their place of manufacture. The research focuses on kākahu of the pre-European and contact period, those textiles without European influence, to reveal the mātauranga Māori of a people who had made Aotearoa their home, several hundred years before European contact. The wider research context for this thesis is prompted by the serious situation that kaitiaki (guardians) in museum collections care face, when a high percentage of Māori textiles have no provenance, and their condition is poor.

Reconnection is a matter of urgency because of the deterioration of the dyed black fibres in traditional Māori textiles due to the acidic nature of the iron-tannate dye. (Daniels 1999, 75–76, Te Kanawa 2005, 7–8). The deterioration of the black fibres provides the impetus for this research as the poor condition causes a complete collapse of the woven matrix which limits handling and display and, in some cases, results in a loss of knowledge. While a stabilizing consolidation treatment has been engineered to retard the degradation of black fibres, as indicated in my master’s thesis, (Te Kanawa 2005, 19–49), this treatment is still being evaluated and, therefore, the perishing of the black fibres continues. This research employs a heritage material science framework, to contribute to the ongoing conservation of taonga kākahu.

## Preliminary investigations

Initially, this research was part of a wider Marsden<sup>2</sup>-funded project with Geological Nuclear Science (GNS), in which the research proposed to investigate geochemical properties of the iron-rich mud (paru) used to dye the fibres black, in the process of determining their provenance. It was hoped that elemental analysis could link the mud sample to that of the black fibre in unprovenanced kākahu and connect descendants to their taonga kākahu by identifying their rohe (region) and, therefore, their hapū or iwi (subtribe or tribe). Photon-induced X-ray emission-PIXE was the analytical tool proposed for iron-rich mud samples and the dyed black fibres in the taonga kākahu, without provenance.

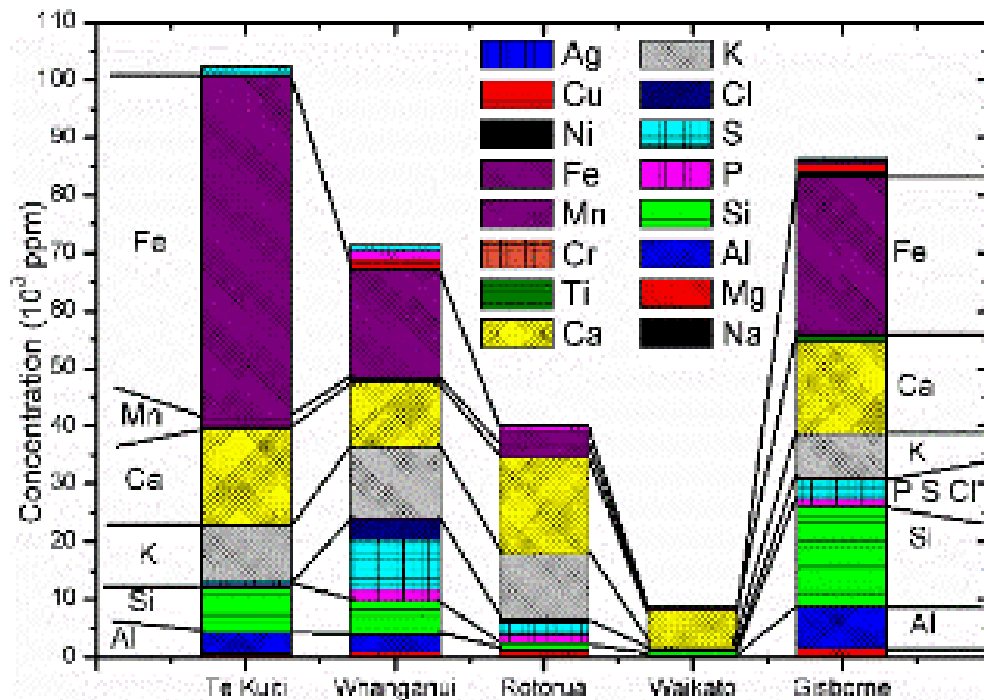
Preliminary work from the analysis of five samples of detached pokinikini (cylindrical lengths with black fibrous sections) that had provenance, were taken from the collection at Te Papa. The analysis by GNS with PIXE analysis gives a clear representation of the quantity of iron source in each sample, however, it was not able to determine the quality of the iron. (Graph 1) This preliminary work could not be juxtaposed with the PIXE work and the variables for this ambitious research were too many and not proven to be effective either to compare mud and black fibres or to provide evidence for stabilization of the black fibres. After the first year of research, the decision to withdraw from the project and pursue the research independently and to refocus on other analytical means to identify provenance.

The new direction of this research aimed to engage more closely with Māori communities and conduct the research with an approach drawing on the practitioner's knowledge, material processes and sciences within a mātauranga Māori framework.

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<sup>2</sup> Jamie Morton, 2015. 'Track the Black: The Whakapapa of Paru. New Zealand Herald Marsden Fund grants millions to new research projects.' *NZ Herald*, 5 November 2015. <https://www.nzherald.co.nz/nz/marsden-fund-grants-millions-to-new-research-projects/VBQWBGYS2RR4RLH76NIKGFFTKI/> (accessed 1 September, 2021).





Graph 1. PIXE elemental analysis of dyed black fibres from provenanced piupiu.

As well as using conventional academic and scientific methods, this study aligns, for Te Papa, with the contemporary quests to reconnect taonga kākahu and tangata whenua evident in several other fields of study. The identification of feathers woven in kahuhuruhuru by Harwood informs today's weaver which feather type and how many birds of each feather type were needed to complete the feather cloak (Harwood 2011, 125–147). Furthermore, the work of Blackman with woven samples replicating early tāniko (decorative border) weaving techniques, and her extensive research into early Māori cloaks held abroad and production of the weaving technology in samples was the inspiration for a young male weaver to repeat the work (Blackman 2019, 75–94, 1985 12–15, 1998 23–26).<sup>3</sup>

In this research I explore the language of traditional Māori weaving, the material processes and composition and employ the concept of material science from a conservation perspective, with a focus on the dyed material and construction. Working at ground level this research collates the results of practitioner's process of materials and, to determine provenance, hypothesises that material resources and practices are typical of a region. In

<sup>3</sup> Matthew MacIntyre, personal communication with the author, description of woven tāniko replicating description of Blackman work, 2018.

this quest the connectivity with materials and indeed, its narratives, are representative of Te Ao Māori.

The creation of taonga kākahu, holds a wealth of traditional knowledge that speaks of a culture connecting the natural and human worlds; Te Taiao (the natural environment) and whakapapa (genealogy). In Te Ao Māori there is a universal awareness of acknowledgement and respect for all living things, natural elements and forces, and the whakapapa (genealogy) of each (Royal 1998). These values and principles are fundamental to Māori culture and an essential set of protocols to live by (Harmsworth and Awatere 2013, 274–275).

### **Background: Disconnection and reconnecting people and their taonga**

As a result of the historical process of trade and gifting, and a lack of the documentation for transactions many of these intricately crafted taonga are now irretrievably separated from their unique cultural and tribal origins. During the contact period from circa 1770, curiosity and intrigue spurred Māori to show interest in their new European arrivals, their culture and technology. Māori exchanged their possessions, such as taonga kākahu, for iron implements and other materials. Consequently, this cultural heritage left the shores of Aotearoa and, today, much of it remains in private collections or has been gifted to museums overseas (Richards 2015, 7–8). The exchange of objects eventually led to Māori forfeiting many of their traditional practices and adopting European materials, language, and culture. European settlement increased rapidly from the early to late nineteenth centuries coinciding with the loss of Māori land ownership, material resources and posing a challenge for Māori to retain their culture. The *New Zealand Historical Atlas* provides valuable information on both the natural environment over the centuries and the people who settled in Aotearoa (McKinnon, 2003). It presents detailed accounts of Māori and European settlement noting the impact of each culture and acknowledging Te Ao Māori.

A number of Māori textiles held in museums, nationally and internationally, have dyed black fibres that are in poor condition and, in most cases, are without provenance. My overall view of Māori textile collection items, gained from my experience of more than twenty years in the museum sector in Aotearoa, is that there are very few surviving kākahu

from pre-European and contact periods. An estimated one third of the textile collections in Aotearoa appear to be made post-European contact. The majority exhibiting European influence, with the inclusion of wool and cotton that substitute the materials and technology of classical Māori textiles. Te Manakura has studied the kākahu collection at Te Papa and identified European influences in the innovative construction of these kākahu, assigning them the term “hybrid forms” and concluding that tūpuna weavers who embraced new technologies maintained “mātauranga taketake” (Te Manakura 2007, 133–142). Colonial influences certainly provided for change and innovation, however, as we now know, much of this has been to the detriment of Māori.

The Treaty of Waitangi, signed in 1840 by most of the then prominent Māori chiefs and British crown representatives, was the founding document which for both cultures have provided, eventually, a blueprint for partnership, participation, and protection. But for much of Aotearoa’s early history of encounter, the Treaty was not adhered to, and Māori land was appropriated by the settler government through the introduction of the Native Land Court in 1865 (Belich 1996, King 2003). It was also a time when the voice of Māori women was silenced, and European male dominance was complete with major land negotiations being conducted by males only. Traditionally, Māori culture recognizes the voice of the wāhine (Māori woman), as the person who brings the continuity of life and whakapapa and should be heard regarding the well-being of her respective family and tribe (Ballara 1993, 130–131).

Over the century of conflict with European settlers, Māori lost most of their land which resulted in an almost insurmountable depletion of cultural heritage and natural resources and, ultimately, identity.<sup>4</sup> There is a significant loss of worth experienced by Māori today who have no connection to whakapapa or cultural identity. This contemporary lack of identity, values, knowledge, or aroha (love and empathy) is the result of colonization. There is an alarming number of Māori youth influenced by ethnic gangs and, today, several generations of Māori families are founded on gang culture.<sup>5</sup> Violence is normality and harm

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<sup>4</sup> See: “Māori,” *Te Ara: The Encyclopedia of New Zealand* <https://teara.govt.nz/en/maori> (accessed 1 May 2021). See also: Michael King, 2003. *The Penguin History of New Zealand*. Auckland: Penguin Books.

<sup>5</sup> See: “Culture of Violence,” *TIME Magazine*, 16 July, 2007.

inflicted on their own family members; partners and children has meant that those being colonised have become the colonizers of their own descent and culture.

It is apparent that many Māori people, particularly those belonging to recent generations who have been disconnected from their turangawaewae (homeland), are not well versed in their whakapapa or cultural heritage. They often struggle to find direction and self-worth in the contemporary, colonized society of Aotearoa. Wirihana discusses this historical trauma resulting from generational colonial impact on Māori (Wirihana 2014, 200, 198–201), and many Māori scholars have both discussed and presented on the impact of colonization, identifying a long list of deprivation statistics. These include the country's highest rates of male youth suicide, representation in prisons, child abuse and fatalities, poverty, and serious health issues (Durie 2011, 24-36, Pihama, Reynolds, Smith, Reid, Tuhiwai Smith, Te Nana, 2014, 248-262, Ati Hau 1997, Beutrais and Fergusson 2006, Pool and Kukutai 2014, Poata-Smith 2013, Reid Taylor Moore, Varona 2011, Walker 2004, Belich 1998).<sup>6</sup> The term 'genocide' has been used to describe the horrific impact of colonization from which the recovery or restoration of dignity for Māori remains within themselves with total support of Aotearoa's governance. These underlying social problems drive this research project which aims to provide a means of connection for Māori to Te Ao Māori through the knowledge of taonga kākahu.

Whakapapa is a key Māori customary concept which is vital to this research. I argue that it is one of the most important and unique values in being Māori, and whakapapa remains today without compromise by colonization. Ko wai koe? Who are you? What is unique to you? These simple questions may seem somewhat derogatory however, they are fundamental to the identity of being Māori. Identity is basic to each person's existence as it provides direction for decision-making throughout one's life, it is the quality of *connectedness*. The whakapapa of a Māori person can be retained within their pēpeha (ancestral and land affiliations), which recounts their lineage over many centuries, and their connections to the lands, rivers, and mountains of historical tribal settlement. Traditional Māori practices, or tikanga, are noted for the holistic way in which they inculcate a respect for and awareness of all living things in a co-existence that affords a sustainable state of

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<sup>6</sup> See: Te Puni Kokiri, 2019. "Whanau-centred approaches to address family violence," Health Report. Wellington: Te Puni Kokiri.

well-being.<sup>7</sup> This thesis argues that traditional Māori textiles hold the knowledge, the concepts, and values of being Māori, which can be revealed to restore people's identity and reconnection to the past, their land and their communities.

Andrea Morrison (1999, 46) writes that:

Whakapapa links Māori as descendants of Papatūānuku (Mother earth) and Ranginui (Sky Father) and records an intimate link for Māori with the earth and the physical world. We can be linked through whakapapa in the varying relationships of whānau (family), hapū (subtribe) and iwi (tribe) to the landscape of tribal areas specifically to mountains rivers, lakes and sea. Whakapapa also means that a person's ancestors populate space through historical time and present time. Historically places have been named by ancestors and named after them. The stories of ancestors and places are associated with a record and thought at hui (gatherings) and in conversation.

This research employs an indigenous epistemology, or world view, and ontology, or way of being (see kaupapa Māori methodology below). The retention of whakapapa through oral histories demonstrates the philosophical and practical values of the culture of Te Ao Māori. Whakapapa can be recited and describes the beginning of time, when there was nothingness, to the emergence of consciousness leading to the separation of night and light from which life evolved on earth (Marsden 1975). The naming of these evolutionary phases, that are noted through cosmology, is similar for all Māori tribes, each acknowledging Te Kore, the realm of nothingness, and Te Pō, the complete darkness and realms of the night. These are followed by Te Ao Marama, the separation of the earth and sky bringing light upon the living earth. This collective cosmological vision of time and space, and past, present, and future, expresses the Māori awareness of how all things—people, plants, animals, earthly and universal elements—are recognized through whakapapa (Marsden 1975). Through a close technical analysis and visual interpretation of weaving, this research aims to identify and reveal the metaphorical narratives recited by Māori ancestors, which link the material embodiment and the spiritual presence of Te Ao Māori.

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<sup>7</sup> See for example the work of Māori scientist Ocean Mercier at Victoria University of Wellington: <https://www.wgtn.ac.nz/wellington/solutions-in-indigenous-science> (accessed 15 May 2021).

This Māori world view is often at odds with the scientific western view of the world, which has been enshrined in the institution of the museum and in the ways in which it collects and exhibits material culture of colonized peoples (McCarthy 2011). Nonetheless, today the identity of the indigenous people of Aotearoa remains tied to Te Ao Māori. This existence or way of being and doing is not a religion, it is a culture which allows the individual to connect to others of past generations, and even further back to the beginning of time. Māori ancestors held fast to their practice of reciting phenomena from the beginning of time in karakia (incantations, prayers) and waiata (songs) (Salmond 1980). This chronicling of phenomena and events, along with the naming of people and landmarks through whakapapa, was expressed through a range of visual and performing arts and objects such as weaving taonga kākahu. Ngata describes reciting whakapapa by the act of building layers when weaving kaha (rope, line-descendant) with the aho (weft) (Ngata 2019, 22).

The thesis also explores Te Taiao, the natural world, which is related to Te Ao Māori in an integrated way quite different to the western separation of nature and culture (Orbell 1995, Salmond 2017). Analyzing the metaphysics of material resources and their performance and representation in woven cloaks identifies the whakapapa of plant materials; harakeke (*Phormium tenax*), hīnau (*Elaeocarpus dentatus*), tānekaha (*Phyllocladus trichomanoides*), mānuka (*Leptospermum scoparium*), and others that are all the children of Tāne Māhuta (atua-God of the forest). Each plant has its respective whakapapa, as too does harakeke-Ruhia-Tāne Māhuta-Papatūānuku (mother earth) and the iron-rich mud from Papatūānuku that is used to dye the fibres black—it is the awa (river or stream) that keeps the soil moist, the repo (swampland) and mineral deposits that flow down from the maunga (mountain). Best illustrates this whakapapa of water qualities as it descends from the mountain to lowlands and changes form along the way (Best 1976, 235–236). Within the connectedness of whakapapa, the location, the land where tangata whenua settled, their awa, maunga, repo, harakeke and the ngahere (forest), are all acknowledged.<sup>8</sup> The analysis of plant materials and iron-rich soils may provide signatures found in the dyed fibres of taonga kākahu, which may provide links to the people of that land.

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<sup>8</sup> Ka Huru Manu is a project dedicated to creating a Ngāi Tahu Atlas of place names and histories: <https://www.kahuruman.co.nz> (accessed 1 August 2021).

By the late twentieth century, the impact of colonization had displaced Māori from their lands and material resources, their rivers, and their livelihood.<sup>9</sup> It was not until the 1970s that the government of New Zealand recognized the grievances of its indigenous people and addressed the fact that the principles set out in the Treaty of Waitangi had not been honoured (Orange 2012, 4). The government then proceeded to negotiate compensation with Māori for their loss through the Waitangi Tribunal.<sup>10</sup> The first land settlement with my own Waikato tribe of Tainui took place in 1995 for the value of \$170 million to compensate for the land confiscations by the crown. Since then, continual negotiations have resulted in the settlement of claims by several iwi and there has been increased momentum towards social development including cultural redress. The settlements have provided a platform for iwi to develop capital ventures and rebuild economic bases. Some of these ventures align to the principles and values of Te Ao Māori and aim to restore a state of well-being and identity. The government also recognises the values of Te Ao Māori imbued in the mana taonga policy. Te Papa has developed a mission to pursue the reconnection of those traditional taonga to tangata whenua (Hakiwai 2014, Hakiwai et al. 2014).

## **Museums and Māori**

Despite the detrimental impact of the colonial encounter on Māori culture and the ways in which museums have been implicated in that process of alienation (Tapsell 2006, McCarthy 2012), from the 1980s there have been dramatic changes in New Zealand museums, which have led to an increase in Māori engagement with their taonga. This has partly been a product of the new museology which has critiqued the ethnocentric representations of native and tribal peoples and advocated the involvement of source communities in the active management of their heritage according to their own cultural perspectives (McCarthy 2011, 2018). Further to this was the huge breakthrough achieved by the *Te Māori* exhibition (Mead 1984), which toured the United States and New Zealand between 1984 and 1987.

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<sup>9</sup> Ian Pool, “Death rates and life expectancy: Effects of colonisation on Maori,” Te Ara Encyclopedia of New Zealand <http://www.TeAra.govt.nz/en/map/26591/maori-land-loss> (accessed 2 November 2021)

<sup>10</sup> Set up by the Treaty of Waitangi Act 1975, the Waitangi Tribunal is a permanent commission of inquiry that makes recommendations on claims brought by Māori relating to Crown actions which breach the promises made in the Treaty of Waitangi.

This exhibition recognized the mātauranga of taonga and acknowledged the culture from whence it had been disconnected.

This was an important exhibition, curated by Hirini Moko Mead, which showcased traditional objects comprising wood carvings, bone, and pounamu (green stone) ornaments and weaponry. Disappointingly, however, no Māori textiles were included. This exhibition prompted huge awareness by both Māori and non-Māori that ancestral treasures instantiated powerful values and concepts of Te Ao Māori. From this time, the national museum was encouraged to develop new arrangements for governance, management and public programs that recognized and included descendants of the taonga Māori.

Some significant steps were taken to reinstate aspects of Māori culture and have Māori themselves involved in the museum sector to speak for and care for their taonga (Mead 1997a, Mead 1997b, McCarthy 2011). The training of Māori was supported by the Department of Internal Affairs aiming to produce museum professionals in conservation, a first step in the development of biculturalism in the national museum, known now as Te Papa and recognized for its leading role globally in institutional cultural awareness (McCarthy 2018).

As a relatively recent adaptation to museum practices within a set western construct, Te Papa's bicultural policies brought major changes to the management and care of taonga. The mana taonga policy developed in 2005 advocates the connection of taonga and its mātauranga Māori to people (Hakiwai and Schorch 2014, McCarthy, Hakiwai, Dorfman, and Twomey 2015). There has been more interaction and participation with Maori since the development of the mana taonga policy at Te Papa. As McCarthy shows in *Museums and Māori* (2011), museum professionals can learn the cultural significance of taonga for the people who descend from the taonga and manufactured them. Te Papa leads the way in bicultural collection care and management. Significant change and innovative developments with Māori communities have also been part of my experience as an employee over many years at Te Papa. I have conducted the current research both as a conservator of textiles charged with the care of Māori textiles held at Te Papa, and as a female Māori weaver knowledgeable in the craft of traditional Māori weaving due to my whanau background and whakapapa. This knowledge of weaving has been inherited from a



strong family line of traditional Māori weavers which, as I explain in the next chapter, was the foundation for my career in conservation.

Today, Te Papa holds the largest collection of Māori textiles in the world. There are many different types, each with its own specific material construction and representation (described in chapter one). A select few kākahu are described in chapter four with a focus on the plant material, fibre preparation and weave construction, thereby providing a closer look at the kākahu to appreciate the craftsmanship and intent of traditional Māori weaving. The conservation of the cloaks described is also discussed in this thesis.

This progress in Māori involvement in museums is part of a widespread Māori cultural renaissance (Walker 2004). It is also encouraging to know that, today, the Māori language is being recognized and is encouraged by this country's government departments and by Parliament. Mainstream television and national radio presenters are now formally introducing and ending programs in te reo Māori (the Māori language). For Māori and non-Māori this recognition will hopefully lead to a partnership of respect and equality, and for Māori the capability and confidence to reinstate their cultural identity. In today's challenging world of unknowns, for example a global pandemic, those most affected are finding strength in the values that they have been brought up with. It is timely, therefore, for Māori to seriously consider understanding and knowing their identity to reconnect to Te Ao Māori and apply its values to this modern, changing world.

What about modern kākahu and the general knowledge and understanding of weaving today? Currently, modern materials are, in part, substitutes for the cultural practices and materials of our past. Māori, in recent years, and certainly at the point of European contact, have taken up western materials to construct the modern symbolic cloak. The general term 'korowai' often describes the modern cloak, however, when we compare this cloak, which in some cases has been made with a piece of fabric with feathers adhered to its surface, the materials and technical application are far removed from the traditional korowai, which is identified by the black plied thrums that cover the main body. This scenario of naming the modern cloak a 'korowai' is questionable. It reflects widespread ignorance of Māori weaving and suggests that we need more education about this unique art form. This is a concern because Māori also accept the current terminology and classify it as a 'taonga' and yet there is little mātauranga in the modern cloak when the foundation is a bought fabric,

and the feathers or wool are stitched or adhered. There is no fibre from harakeke on any part of the cloak, nor is there any mental application in the material processes or construction in keeping with the mātauranga of Te Ao Māori and the connection with Te Taiao. One might argue, though, that the actual make-up of the cloak is not as significant as what the cloak represents, that is, Māoritanga or a sense of Māoriness or Māori cultural identity. To refer to the modern 'cloak' as the traditional cloak is, in my view, incorrect. The acceptance of the modern cloak as a 'korowai', and the application of the term sometimes to the traditional cloaks, for example, is indicative of how disconnected Māori today are from their ancestral material culture. Furthermore, the number of Māori who are not familiar with the plant or fibre of harakeke is of concern.

In addition, I have observed that there is general lack of understanding and appreciation of woven cloaks on display. Museum exhibitions of kākahu, usually a simple rectangular woven piece without limbs, often display them on mannequins or upright forms and rarely show them flat or with any supporting information. In some cases, it seems, the kākahu is briefly glanced over by visitors and there is little interpretation of its history, construction, or connections to land and people. There should be more context including what type of cloak it is, what it is made of, and the processes employed to result in a particular finish, as well as an interpretation of its possible meanings, as I suggest in chapter four of this thesis.

Taonga kākahu reflect the indigenous people of Aotearoa who were knowledgeable about their surroundings and the cultural practices with which they founded their homeland. This research, therefore, advocates that those cultural practices can be retrieved, understood, and practised as means of reconnecting to Te Ao Māori.

### **Aims, objectives and research questions**

The aims and objectives of this project are to analyze and present the mātauranga Māori of taonga kākahu. The research will reveal this knowledge by examining in detail the materials, construction, and design of a selected number of unprovenanced taonga kākahu that are housed overseas and in Te Papa's Māori textile collection store. This critical material culture analysis will be conducted by myself, as a weaver and professional conservator. In addition, I take a practical approach to replicate a section of the chosen

artefact studied, to identify the materials, processes, and techniques employed in the making of the selected cloaks. The results of this work will assist in characterizing what is typical to a period and/or a region and will contribute to the overall effort to explore various pathways for reconnecting taonga to their iwi. The intangible knowledge of Te Ao Māori (Barlow 1991, Best 1922, Brougham and Reed 1975) and the tangible knowledge of the taonga kākahu will thereby be transferred to the people.

The research questions for this thesis are as follows:

How and why should pre- and European contact period taonga kākahu in museum collections be reconnected with tangata whenua?

How can the mātauranga of dyed black muka in taonga kākahu help connect them to their places of origin and support their stabilization?

How can the mātauranga Māori in textiles help Māori well-being and identity by reconnecting Māori people today to Te Ao Māori?

This study is fundamentally about the connection to historical practices and both tangible and intangible forms of the traditional way of life. Whakapapa provides that connection to land and people, historical events that took place in that area, the people who were involved and settled there, their marae (community domain), their urupā (cemetery) mountain and river. Eruera Stirling describes the impact of mātauranga as “a blessing on your mind”, it makes everything clear and guides you to do things in the right way. It is the man who goes with his spirit, mind and his heart believing in all things who will climb to the high summits of leadership (Salmond 1981, Stirling in Salmond 1982, 214). Linda Tuhiwai Smith (1996) explains that whakapapa has multiple layers and multiple meanings, that it provides an important frame of reference for how Māori organize and manage positionality and relationships. Whakapapa also provides a means of storing, learning, transmitting, and inscribing knowledge.

A tohunga (dedicated person of priesthood rank) would recite, as it was not written in traditional times, the philosophy of life and its creation from Te Ao Māori to the benefit of everyone of Māori descent as it identifies mātauranga Māori, the whakapapa of families, tribes, events, and place names. The nomenclature in taonga Māori retains this mātauranga and maintains the link to Te Ao Māori. This study explores the ways in which weaving can

act as an ontological model for connecting to cultural identity through whakapapa. The idea of the intangible values of mātauranga comes from contemporary interpretations of the work of Sir Āpirana Ngata and Te Rangihīroa (Lythberg et al. 2019), which sees weaving, tukutuku, nets, carving and other visual arts as material forms of whakapapa. Other useful models for reconnecting to identity and knowledge through taonga are referenced by Mason Durie and Hirini Moko Mead (Durie 2014, Mead 1984).

## **Literature review and research context**

There is sufficient literature (Best 1898, Buck 1926, Mead 1969, Blackman 1998, Clavir 2003, Daniels 1999, Evans 1999, Hakiwai 2005, Harwood 2011, Henare 2005, McCarthy 2011, Pendergrast 1988, Sully 2007, 2015, Roth 1923, Royal 2009, Schorch 2016, Smith 2018, Te Kanawa 2005, Tamarapa 2011, Whiting in Sully 2007) available in the fields of Māori studies, anthropology, museum and heritage studies, conservation and heritage materials science to assist this research. This section briefly surveys some of this literature and identifies a large gap in terms of reconnecting taonga kākahu to iwi through the customary knowledge of dyeing textiles using iron-tannate. This thesis in museum and heritage studies is interdisciplinary and draws on professional knowledge relating to museum collection care. Within museum and heritage studies the research focuses on the strand of literature which deals with contemporary museum practice and indigenous people (Peers and Brown 2003, McCarthy 2011, Tapsell 1997, 2006b).

This study does not deal with kaitiakitanga in terms of the work of Māori curators and collection managers in museums (Tamarapa 1996, Hakiwai 1999, Johnstone 2001, McCarthy 2011) but focuses on conservators and conservation from a Māori perspective (see interviews with Te Kanawa, Whiting, Tupara and Evans in Clavir 2003). However, it does draw on the wider discussion of kaitiakitanga in the co-management of the natural environment (Mulholland et al. 2010). In focusing on community engagement with museum collections, the field of conservation has moved from a focus on materials to one on values and people, and this research is in line with this recent thinking about conservation theory and practice (Sully 2015). Furthermore, the research employs an analytical framework drawn from the work of Dean Sully who advocates decolonizing conservation (Sully 2007). “In acknowledging the existence of alternative stories and parallel ways of understanding,

utilizing, and caring for the material past,” writes Sully, “it is possible to ‘other’ ourselves within the discourse of heritage conservation” (Sully 2007).

My research builds on the work of Māori heritage practitioners, such as Dean Whiting, Jim Schuster and Arapata Hakiwai, who employ Māori concepts and approaches in caring for ancestral treasures, heritage buildings and sites (Sully 2007, Clavir 2003). Whiting, however, recognizes some challenges in sustaining the management and support of preserving cultural heritage with conservation practices in the community and recommends an integration of both cultural and institutional support. Whiting points out that these opportunities “are only possible, however, if we first recognize the wider cultural landscape that institutions are involved in and develop integrated approaches to the work” (Whiting in Sully 2007, 72). Recognition of the people associated with the taonga is advocated by Shuster, a direct descendant of *Hinemihī* after whom the ancestral meeting house is named (Shuster in Sully 2007, 175, Barton 1985). While the western practice of conservation science focuses on the stability of the object’s material composition, the mātauranga of the object, in this case taonga kākahu, can be preserved within communities if supported with a knowledge of material composition.

Several well-known authors have described Māori textiles and their functionality (Buck 1911, 1924, Mead 1969, Roth 1979) and provided good technical notes on the textiles in museum collection stores (Pendergrast 1988, Tamarapa 2011), but there is less writing about weaving techniques by weavers in the community (Meads 1969, Te Kanawa 1992) and even less documentation that throws any light on the problem of tracing the places of origin of Māori textiles of the pre-contact and contact periods. The available literature covers a general technical description of construction in Māori textiles and, in a few cases, information that records processes or recipes of black dyeing, however, few of these provide information distinctive to a region, such as which tannins or harakeke are used. Our knowledge of this process is fragmentary and must be pieced together from historical ethnographic sources. The book *Life at the Pa* briefly describes a recipe for black dyeing, concerning the sourcing of the mud where kahikatea (*Dacrycarpus dacrydioides*) abounds, and the fixing of the dyed black fibres with a post-treatment of a hīnau berry solution (Chapman-Taylor 1952, 29). During the Dominion Museum ethnological expeditions of 1921 to the Whanganui River, films and photographs were taken of a local woman Rhipeti

Aperaniko at Pipiriki using paru to dye some muka (see figure 2 below), which Te Rangihīroa (Sir Peter Buck) described in his notes now held in the Bishop Museum in Honolulu (Salmond et al. forthcoming 2021). Therefore, sources such as this, and knowledge or narratives that are held with tangata whenua and gathered through this research, will add to the available pool of information, and may support the objective of making a connection back to iwi and revitalizing customary practices such as dyeing muka with paru rather than with shop-bought dyes (Te Kanawa 1992).

While working with iwi or hapū, I visited regional museums to research their taonga kākahu, both with and without provenance, in search of any information that points to characteristics typical of their regions. The museums' records provided some information about collection acquisitions, although most records contain little data about provenance. A few secondary sources describe certain regions during the period of Māori settlement (Phillips 1989, 1995, Best 1922; Irwin 2013, Smith 1910, Gudgeon 1885), and prior to visiting iwi or hapū, any known history relating to Māori settlement of the area was read and noted, including Māori sources in the form of pēpeha and waiata. In this study, reference is made mainly to the literature of museum-based collections research and conservation material documentation, including photographs.

In every culture a covering to protect oneself against the elements has been a necessity. The clothing of Māori was developed after their arrival in Aotearoa, by processing and crafting various items for everyday living from the plant materials of their new homeland. Their adaptability, innovation and methods of processing can be examined in the examples of clothing they manufactured. Within the realm of Te Ao Māori, these remain with us today, preserved in the current practice of weaving, rather than in any published texts or manuscript sources. Therefore, as I explain in the methods section following, part of this research involves making and doing, exploring the execution, construction, and methods employed in making cloaks and producing recipes for dyeing. Selection of muka, and the processing of it into various threads for application are examined also.

The gathering and processing of materials for making kākahu connect weavers with the environment, and the lore of the forest, the ngahere, as practised by Māori has been recorded by Best (1977). The forest, lands, rivers, and wetlands are well described also in Park's ecological history of New Zealand (Park 1996). The harvesting of harakeke and the

further tasks of gathering natural resources, constitute a personal enlightenment of connecting to Te Taiao, the natural world, solitude, and spiritual awareness. Weavers must be prepared for the long haul realizing that many hours of preparation lie ahead, and mental preparation is important as is the time allocated for the tasks. Tikanga or protocol adheres to the rule that a woman menstruating should refrain from gathering materials from the field as she is considered sacred at this time and should be without tasks or even be isolated. Identifying harakeke, however, requires a planned excursion into the field. There are sixty-three varieties known today (Orchiston 1994). In traditional times each iwi and hapū had names for their harakeke and some of these are documented (Best 1976). The two varieties of harakeke (*Phormium tenax* and *Phormium cookianum* wharariki) have different properties. *Phormium cookianum* produces coarse fibre and leaf content ideal for functional items such as kete (baskets) and whāriki (mats) while *Phormium tenax* produces finer fibre suitable for making clothing.

I am fortunate to have access to a pā harakeke established some years ago by my grandmother and mother. The gathering of barks occurs further afield and involves driving some distance to a forest. The ngahere was much respected by early Māori as it provided resources for weaving and food, it also filtered water and nourished the rich soils of the forest bed. The canopy of trees and punga (*Cyathea sp.*), the big, brown, and tall black punga, are a typical feature of the ngahere that I frequent.

Harakeke is the broadleaf plant native to Aotearoa, which offered strength and lustre and was in abundance (Best 1898). In leaf form, strips of harakeke were plaited (raranga) into functional items such as whāriki and kete and in fibre form; cordage and plied fibres produced whenu and aho (warps and wefts) to make textiles. Only three colours (black, brown, and yellow) were used in traditional times and, although only black and brown were common in cloaks made in the late eighteenth to early nineteenth centuries, the yellow is seen more often after this period (Te Kanawa et al. 2002). The weft threads are dyed for the weaving of the decorative tāniko borders and on rare examples the warp threads are dyed black. Black threads are dyed by first being soaked in a tannin solution of bruised bark pieces taken from the hīnau, then submerged into a paru, rich in iron and left overnight. Other tannins are used and result in different degrees of blackness. The iron-tannate black dye has been used since early civilization, however, as noted above, it is subject to

deterioration due to the acidic nature of the dye process, and it is commonplace to have fragmentation of the black fibres in aged textiles.

Finger pair twining is the technique used by early Māori to construct their textiles. Twining dates to 5000 BC and, unlike for a woven fabric, is not woven on a loom (Barber 1940). Traditionally, Māori secured two wooden pegs in the ground between which the work was suspended. The first weft row joining all warp threads, is worked before the work can be suspended by the ends of the weft threads. Single and double pair twining are known as *whatu aho tahi* and *whatu aho rua*, respectively. *Tahi* (one) single weft can be seen atop or at the face of the warp thread and the other is obscured under the warp. *Rua* (two) wefts are seen at the face of the warp and the other two under the warp. When double pair twining is worked the underlying two wefts are parted, the warp positioned atop and the top two wefts passed over the warp and between the parted wefts that then cross over from front to back, interlocking and securing the warp into position. The construction of traditional Māori garments requires commitment, discipline, and respect. Māori clothing, tools, and objects fashioned as functional or symbolic items are genuine, authentic examples of what was experienced in the native environment of early Aotearoa (Prendergast 1988).

The traditional Māori way of life (Pomare 1908, Ngata and Jones 1949, 1961, 1970, 1990, Marsden 1975) is described as sustainable, one that was connected to and respected the natural world (Andersen 1948, Orbell 1978). The good health and family structure of Māori was described as admirable by early explorers. Regrettably, the culture was compromised by colonization and today some of the few tangible examples of what was once a sustainable, healthy culture, are collection items such as *taonga kākahu* (Neich 2013, Firth 1940).

Traditional practices of resourcing materials maintained the health and sustainability of natural resources. In addition, was the constant presence of tangible and intangible culture, ranging from material resources to the oral histories that recited the connections between people, land, water, and the universe. Connectedness between *tangata whenua* (the people of the land/indigenous people) and *Te Taiao* (Buck 1949, King 1975, Walker 1992, Best 1977), is a fundamental aspect of *mātauranga Māori* (Royal 2004). The philosophy of life and its creation came from *Te Kore* (the beginning, the space of nothingness) to *Te Ao Mārama* (the world of light) (Anderson 1948).



Māori textiles and their functionality are well described in ethnographic scholarship of the early twentieth century, including that of Te Rangihīroa who was very interested in weaving (Buck 1924, Roth 1924). In some cases, Te Rangihīroa (Buck) and Roth refer to the writings of early Europeans. In addition, technical notes of some kākahu in museum collection stores are available (Mead 1969, Pendergrast 1988, Tamarapa 2011 (Pendergrast 1988). The make-up and construction of taonga kākahu is supported with diagrams and descriptions (Roth 1979, Buck 1924) and, overall, Roth provides clear diagrams and descriptions, from a weaver's perspective, which provide sufficient technical information for construction. Roth also gives technical notes for some kākahu stored in museum collections in the United Kingdom. While dyeing the fibres black is described in part, there are very few descriptions of the treatment of fibre with a tannin source and mud, and other dyeing recipes.

In summary, several well-known authors have described Māori textiles (Mead 1969, Buck 1924, Roth 1979, O'Malley 2012) and provided technical descriptions of the textiles in museum collection stores (Pendergrast 1987, Tamarapa 2011), but there is less writing about the procurement of materials and their knowledge value from a Māori cultural perspective. There is also little analysis of Māori textiles for the pre-contact and contact periods apart from the writing of Margery Blackman (Blackman 1998), and even less that describes material processes. As noted above, Chapman-Taylor briefly describes black dyeing and sourcing the mud where kākikatea abounds and fixing the dyed black fibres with a post-treatment of hīnau berry solution. The second treatment of hīnau solution may attribute to the neutralising of the iron tannate complex, although this is to be scientifically proven, some weavers practice this and report their piupiu last longer than those did not treat a second time. It is hoped that the knowledge and narratives held within the community and institutions and gathered through this research will add to this body of information and assist in the objective of reviving these old practices of weaving taonga kākahu. The data collected will support the weaving of a detailed replication samples as experimental archaeology of a select few taonga, as described in chapter four.

The work of Āpirana Ngata, Te Rangihīroa and Pei Te Hurinui Jones was instrumental in retaining aspects of this knowledge, which was recorded in archives, photographs, and museum collections as well as in publications such as the famous volumes of song poetry

*Nga Moteatea*, part two (Ngata 1961). These mōteatea captured events, tribal and personal relationships and recorded these in the format of waiata or oriori. A particular focus of the research is the Māori women of today and how their values, cultural identities, voices, and directions in life can be compared to that of the wāhine of historical times. This focus on women is underpinned by a reference to a rare oriori by Hautu taken from *Nga Moteatea* (Ngata 1961, 205) and is about the house of weaving, where cloaks were woven, and mats plaited. The following extracts in English and Māori capture the value of weaving and the importance of female weavers:

.....

*Take hold of the turuturu,  
When firmly fixed, fasten the topside of the putahi  
then recite the charm to placate Rua-i-te-hihiri,  
And Tangaroa too with his women folk  
Hine-karekare and Hine-ahu-one.  
The women who travelled  
Along the shores of distant Hawaiki  
  
O maidens recite now the potent charm  
Fasten the inland and seaward ends, fasten the very end  
Weave then the woof with wide and narrow spaces,  
Thus, you may finish early, O maiden!*

.....

*Ka hopu rā tō ringaringa ki te turuturu,  
Ka mau, whakaarahia i te pūtahi.  
Tuaumutia rā, ka kai Rua-i-te-hihiri,*

*Ka kai Tagaroa me tāna whānau wāhine,*

*Me Hine-karekare, me Hine-ahu-one;*

*Ko ngā wāhine rā tēnā i haere ai*

*I takutai roa i Hawaiki.*

*E hine rā, tauahatia rā!*

*Tuia a uta, tuia a tai, tuia i te pito, e.*

*Whatua mai tea ho kia kāwitiwiti, kia kātoatoa*

*Mō te oti wawe, e hine!*

.....

As a weaver myself, I interpret the words *Weave then the woof with wide and narrow spaces* as an intriguing weaving command in that this technique could form the textured surface that depicts ocean movements, a theory which is interpreted through an archaeological experiment described in chapter four.

An important part of the literature reviewed in this introduction is the scientific and conservation writing about dyed black fibre (Te Kanawa 2005, Daniels 1999, Smith et al. 2005). During my career as conservator, examining Māori textiles mainly in the museum but also in the community, I have observed the variations in the blackness and stability of the dyed black fibre. All the textiles have a degree of fragmentation, but some are affected less than others and some are notably a deeper black than others. This observation leads me to believe that different dye recipes, with the combination of iron-rich muds and tannins and variations in types of tannin and the amounts and types of iron, are relative to the degrees of blackness and, certainly, of stability.

Today's practitioners source an alternative means of dyeing fibres black because of a decline in the use of the iron-tannate dye method. Instead, they employ synthetic dyes. The convenience of sourcing synthetic dyes from a pharmacy or craft store has led to a common practice. The same applies to other materials for weaving, such as the threads used for both

the warp and the weft, either cotton, silk or rayon, and an assortment of whatever is available in stores.

Te Roopu Raranga Whatu o Aotearoa, a weaving group originally called Moananui a Kiwa Weavers, was formed in the early 1980s, and has been instrumental in the resurgence of weaving with, mainly, a traditional directive. Today the group has over a thousand members who meet biannually. At weaving hui (meetings), knowledge is observed and exchanged, but not written down or published. Robust conversations about material resourcing and preparation, techniques and finished works make for a hub of weaving activities. I remember one occasion when my mother was excited to join other weavers on an excursion planned for the lower South Island to gather kiekie (*Freycinetia banksia*) for the weaving of kete and whāriki. When she returned, she reported the impressive resource of kiekie.

I have observed at these meetings that muka, or fibre work, is much more prevalent than it was when the weaving group began, and it is encouraging to see weavers working with muka. Almost fifty years ago only a handful of weavers were active in weaving with muka. I am fortunate to have had this background because both my mother and grandmother were among those few. The plantation of harakeke that provided for my mother and my grandmother's weaving practice was plentiful, however, often they would have to venture out to source tannin materials, but the iron-rich mud source was handy to the homestead that I grew up in (Te Kanawa 2002).

The modern kura or wānanga, schools of Māori learning based on a mātauranga Māori curriculum, have weaving programmes. These programmes offer diplomas and master's degrees in traditional Māori weaving. My sister Kahutoi was a tutor in weaving at what was then called the Carrington Polytechnic in Auckland, and one of her pupils has successfully graduated to become a tutor. Te Wānanga o Aotearoa offers a weaving diploma in weaving and the head tutor learnt from my mother. This practical knowledge of the art of weaving gleaned from practitioners themselves, myself included, is an important basis for the research in this thesis.

In the role of conservator, I have designed a means of stabilizing the deteriorating iron-tannate dyed black fibres common to most traditional Māori textiles and which makes them

one of the most fragile items in Te Papa's collection, alongside the paper objects. I completed a master's dissertation investigating a consolidation treatment for black fibres (Te Kanawa 2005). The criteria for successfully engineering a consolidation treatment were primarily to be able to bind the fibres together and induce strength without causing a change in colour. The consolidation treatment is the last resort in stabilizing the fragile fibres. The research accepted that such a treatment was irreversible and not a desirable property in conservation of cultural materials. The flexibility of the consolidated fibres was compromised, and the outcome was that the fibres were bound together and retained within the woven matrix of the textile. This consolidation treatment has been evaluated alongside four other consolidates, and the work was published by the International Institute for Conservation of Historic and Artistic Works in the journal *Studies in Conservation* (Smith 2018). The poor condition of these artefacts challenges their custodians. The information that this research gathers will contribute to the knowledge of how best to stabilize the dyed black fibre. There are many gaps in knowledge and scant published literature about these matters, a situation which I hope to address.

No literature is available thus far that references the cultural significance of the black fibres. Were they primarily used as a contrasting element in the weave, described as the colour black (pango) or do they have a metaphorical representation, as in the black of the night (Te Pō)? This thesis also aims to increase both understanding of paru sites, which sustained a healthy source of iron-rich mud, and knowledge of their historical context. In the methods section, below, I explain how a search of historical sites and settlements involved discussions with family or tribal members either connected to or located near the sites.

The literature covers a general technical description of construction in Māori textiles, however, few of these are distinctive to a specific region, or reveal which tannins or which species of harakeke are used. Knowledge of this process is fragmentary and must be pieced together from historical ethnographic sources. As noted above, during the Dominion Museum ethnological expedition of 1921 to the Whanganui River, images were captured of a local woman Rihipeti using paru to dye some muka, (Figure 2). Buck described this in his field notes now held in the Bishop Museum in Honolulu (Ngata et al 2021, Salmond and Lythberg 2019). Knowledge gained from conversations with tangata whenua and gathered

through this research add to this information and support the objective of making a connection back to iwi and reviving the practice of dying muka with paru.



Figure 2. Rhipeti Aperaniko dyeing fibre with mud. Photographed in Koroniti by James Macdonald in 1921 on the Dominion Museum ethnological expedition (Ngata et al 2021, 163).

I was fortunate to witness, as a young woman, the dyeing black of muka in the mud. This process was recorded in 1978 by the then Film Archive which has footage of my mother and grandmother carrying out this practice.<sup>11</sup>

While working with iwi or hapū and by visiting their regional museums to research taonga kākahu, both with and without provenance, I have gathered information about which features might be typical to specific regions. The museums' records have also provided information about acquisitions, where a select few sources described regions during the period of Māori settlement (Phillips 2000, Best 1901, Irwin 2013, Smith 1910). Therefore, before visiting iwi or hapū I read and noted any known history relating to Māori settlement of the area. The provenance of kākahu held in museum collections is not generally known and anything about pre-contact taonga kākahu is almost non-existent, however, literature

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<sup>11</sup> *Aku Mahi Whatu Maori. My Art of Maori Weaving*, Ngā Taonga Sound and Vision, 1978 F15003: [https://www.ngataonga.org.nz/collections/catalogue/catalogue-item?record\\_id=69704](https://www.ngataonga.org.nz/collections/catalogue/catalogue-item?record_id=69704)

produced by the early Pākehā settlers and traders did shed some light on where cloaks might have been acquired (Beaglehole 1962, Richards 2015).

For Māori who have retained their cultural identity, the commitment to embrace those without that identity is inspiring (Awatere 2013). In the foreword of *Whatu Kākahu*, the catalogue of a major weaving exhibition at Te Papa curated by Awhina Tamarapa, the kaihautū Arapata Hakiwai wrote that “the weaving art form continues to energise, inspire and uplift and energise our people, culture and identity” (Tamarapa 2011, 7).

In his own PhD thesis in museum and heritage studies, Hakiwai argues that taonga in museums are important platforms for the social and cultural development of iwi (Hakiwai, 2014, 236–7). The objective of this research is, therefore, to help restore cultural identity, pride, self-worth, and cultural values that have held fast to a sustainable state of well-being in traditional Māori culture. To this information about the material construction of cloaks and other textiles, and relationships between museums, conservation and Māori, and contemporary efforts to reconnect with alienated cultural heritage, there can be added a wider scope of literature that describes and theorizes the Māori world view, and the connectedness between tangata whenua and Te Taiao (Buck 1949, King 1975, Walker 1992). The Māori philosophy of life and its creation from Te Kore including the natural world is of particular interest for young Māori women of today (Reid, Varona, Fisher, and Smith 2016). Connecting with a founding base of knowledge through Te Ao Māori to sustain well-being and cultural identity is a well-known contemporary strategy, *Te Whare Tapa Whā*, employing the concept of four cornerstones within the ancestral meeting house as demonstrated by Mason Durie (Durie 1994, 1999).

Within the field of heritage materials science, this research will build on current knowledge and contribute to our understanding by carrying out colour measurements of various dye recipes. (Cardon 1991). There is a gap in the conservation literature about the application of scientific tools used to establish the provenance of materials, particularly comparing material samples such as iron-rich mud and black fibre, which is the focus of this research (Cornell et al. 1996).

## Research design

The research strategy uses a distinctive mix of both scientific- and qualitative humanities-style methods to gather data. I, therefore, employ a range of theories and concepts drawn from the literature in the analytical framework for this study. In this section I explain the various exploratory methods that are used, which include historical archival research, field work with communities collecting paru samples, material culture analysis of taonga in museum collections, and scientific colour measurements. An interdisciplinary approach recognizes the deep cultural and historical value of paru sites with their unique chemical fingerprints and strong environmental connection to modern and iconic heritage objects and textiles.

In terms of the general approach, this research uses a mix of both light scientific quantitative and qualitative humanities methods to gather a range of data to explore the topic. Findings are analyzed using inductive techniques with results analyzed and discussed according to the conventions of museum and heritage studies. The specific methods and the rationale for employing them to address the research questions are explained below. This research is collaborative and follows the precepts of kaupapa Māori. I am of Māori descent and a weaver and have worked closely with tangata whenua to analyze and extrapolate the practices and processes of their material culture. “Naming the world according to an indigenous world view,” points out Linda Tuhiwai Smith, “might be called a methodology by research, but it is also Māori centric research. This form of naming is about bringing to the centre and privileging indigenous values, attitudes and practices” (Smith 1999, 41).

From these words it should be clear that this research is inspired by kaupapa Māori methodology: research by, with and for Māori. As Smith explains, research “is about centering Māori concerns and world views and then coming to know and understand theory and research from our own perspectives and for our own purposes” (Smith 1999, 39). The gathering of mud and tannin samples and the dyeing can contribute to the material processes which practitioners, weavers and conservators can refer to. In conducting this research, I recognize the deep cultural and historical value of paru sites, with their unique chemical characteristics typical of their respective regions and strong environmental connections to modern and iconic heritage objects and textiles. At the beginning of my research, close visual analysis of taonga in museum collections, using my experienced



weaver's eye, aimed to reveal certain characteristics that could be compared with taonga of known origin. Supporting analysis of the undyed harakeke and the tannins typical of a region was also expected to aid the objective of identifying provenance for the disconnected taonga.

To undertake the study, contact was made with local iwi, hapū and whānau groups and landowners who had access to or knowledge of local paru sites, to obtain samples to build a database. Many sites have become lost or degraded due to farming and land-use changes including drainage and forestry. The impact of synthetic dyes has made the traditional and more laborious dyeing techniques less attractive to many weavers. As the paru samples were collected, conversations were had with people who, it was anticipated, might have been involved in muka-dyeing using the iron-rich mud. This gathering of information helped me to learn more about the various uses and traditional practices. It appeared likely that folk only worked with materials that could be sourced from their region.

Traditionally, muka was extracted from harakeke leaves using a mussel shell, it was soaked in a tannin solution made from the bark of native trees such as mānuka or hīnau trees, and then submerged overnight in the iron-rich mud to give the rich black colour seen in the prestigious Māori cloaks and piupiu. Today these methods and processes can be replicated either by calibration or demonstration by the respective practitioner of that hapū or iwi, which may then identify a method or process unique to that people or region. Dyed fibre samples can then be measured with a colour metre and recorded in the report for this research but also for the local people, the tangata whenua.

As an experienced professional textile conservator from a well-known weaving family, I played a central role in contacting iwi and participating in practical sessions, initially under the aegis of a Marsden-funded project with GNS, and later independently. The contact between me in my role as conservator and someone known to the community also aided with conversations about the stability of private collections. The project resulted in feedback to each of the research participants, including a paru health index outlining the condition and indicating whether there was any concern for the future activity or stability of the site. The paru, dyed muka were compressed into discs and measured for their degree or hue of blackness, as explained further below. The colour measurements were then compared.

## **Methodology**

This study employed a range of qualitative methods to explore the research questions but also drew on quantitative scientific methods as well as kaupapa Māori methodology and practical weaving skills and knowledge. The following key methods selected are discussed below:

1. Field work: Collected paru, harakeke fibre (muka), tannins (waiwai) from iwi and their respective material resources for dyeing muka black.
2. Scientific methods: Carried out colour measurements of black fibres.
3. Experimental Archaeology: A sample reconstruction of a section of each of the selected items, replicating material processes, construction, and design.
4. Visual analysis of weaving: A comprehensive study of two selected collection items from the Te Papa collection store and one from Durham University Museum (all without provenance).
5. Report: Material for the tribal clients or contributors including material samples, which include a paru health index noting the condition of the paru site, paru and a sample muka fibre dyed with their paru and tannin.

### **Field work:**

The research focused first on field work with the collection of iron-rich mud and tannin samples. Most people who contributed samples were connected to a weavers' group, one had contacted me randomly having heard about the project and another approached me at a workshop. The collection of paru samples was a critical component of the research and the utmost respect and gratitude was extended to those that contributed, As a researcher, I recognized that those who were contributing were revealing the source of their wāhi tapu (sacred sites) that were frequented by their ancestors before them. A few references helped

direct the engagement with tangata whenua covering the ethical and cultural approaches to the research (Smith 1999, Cram 2010, Royal 2012), while observing traditional tikanga. It was imperative that ethical practices were observed during the collection of paru samples, and this required a standard of conduct and procedures to be outlined and approved by Te Herenga Waka Victoria University of Wellington. Approval was granted by the Human Ethics Committee (No. 0000023597). Each contributor was sent an information sheet outlining the research work, and they signed a consent form for the collection of samples and a questionnaire form (Appendix 1). In all cases those that were approached and asked to participate approved the research.

A geographical representation of collected samples was made which began with a sample of mud collected from our family paru site, which is in the King Country or western region of the central North Island (refer to Iwi Map Sites). I then collected tannin samples within the region. The remaining sites were one from the north, three on the East Coast, one in the lower part of the North Island and one at the top of the South Island.

Approximately two kilogrammes of mud were collected from seven sites and a total of seven tannins were sourced from different regions. In most cases the source of tannin was not available, only the iron-rich mud. The combination of mud and tannin was to treat one source of harakeke (taeore) collected from my personal plantation. A total of forty-nine dyed fibre samples were then prepared for colour measurement.

The results of the field work contributed to the overall objective of employing various pathways for reconnecting taonga to their places and people. It informs museum curatorial and conservation work by providing more material information about the objects they care for. The tangible and intangible knowledge of taonga kākahu can then be presented through the museum portal, transferring the mātauranga to the people of the land both Māori and non-Māori. During the collection of iron-rich mud samples and other materials and carrying out practical sessions of processing material, I observed a reconnection experienced by the participants when learning traditional methods that were typical of their ancestors' practices. Te Pō, the realms of the night, have a significant cultural value and this research identifies the black fibres woven in our tūpuna kākahu and which carry that narrative. The research also makes a cultural interpretation of the woven technique, whatumai, of the warp and weft thread recited in the oriori, as previously noted, and is in relation to the tāniko

border of the pauku, one of the case studies of pre-European Māori textiles, stored at Durham University Museum (see below).

The results of the field work in this thesis have provided some new information about dyeing the fibre black and the leaf elements, for example tannins give a deeper or lighter black or different hues of black. I also capitalized on my own whakapapa and weaving experience to discuss the practice and philosophy of traditional twining or whatu weaving and engaging with the ngahere and Te Taiao.

### **Weaving samples:**

Presenting replica sample pieces of a select number of taonga kākahu is an attempt to extract the mātauranga and make that information transferable. It was equally important to capture this information before the collapse of the woven matrix caused by the deterioration of the dyed black fibres, to which pre-European textiles are subject. The tangible example of detailed work was accompanied by a technical description which can be made available to practitioners and/or museum visitors. Currently a woven sample replicating detailed whatu (twining) of the kaupapa (foundation) of a kaitaka, (Māori cloak with decorative tāniko borders and without adornment) dated approximately 1850, is on display in Te Whare Pora a Hine-te-iwaiwa at Te Papa's Māori textile collection store, to be examined closely and handled if need be.

The samples produced in this research will be stored alongside the actual taonga. These taonga hold the mauri (life force/spiritual essence) of Te Ao Māori, and the technical execution in the construction of these taonga is testament to mātauranga Māori. The research is committed to transferring knowledge of the undyed and dyed harakeke, the waiwai (tannins) that treat the harakeke, resulting in the degree of black and the construction and design of taonga kākahu.

In the preparation of fibres for threads to weave the replica sample pieces, the processes for dyeing the fibres black were carried out. This work involved engaging with the community and collecting iron-rich mud samples, tannins and where possible examining woven samples that have been dyed with that source of mud. The recipes for dyeing fibres black are reproducible. The dyed fibres were then examined for their differences in hue. It was

anticipated that the processes of dyeing modern black fibres might assist in characterizing what is typical to a period and/or a region.

The collection of mud samples had a geographical representation, which was thought to offer some information toward provenance. The iron-rich mud and tannins gathered were used to dye modern fibres black and then were measured with a spectrophotometer colour metre and the results compared. This data is presented in chapter three.

For at least one and a half centuries of colonization, and following the development of agricultural practices, the health of the paru sites has been compromised and, furthermore, plant materials within the forests, which were cleared for land development, have been lost. During the study of the material processes for dyeing fibres black, the research identified the cultural practices that retain the mātauranga of Te Ao Māori. These practices will be made transferable to tangata whenua and practitioners, with the objective of preserving mātauranga in their quest to weave as they did in traditional times, including the use of paru in dyeing fibre black. The research can contribute to the conservation practice of stabilization by identifying material composition and processes for dyeing fibre black (see chapter two). Previous studies of the stabilization of dyed black fibres in my master's thesis identified two sources of tannins—gallotannin and condensed (Te Kanawa 2005). The two types of tannins give different hues, and each contribute to different reactivity with stabilization treatment. The acidic nature of the black fibre has and continues to be the most challenging material to stabilize in the practice of conserving taonga kākahu.

A key scientific method employed in the analysis of the woven samples was colour measurement. Seven lots of dyed fibre were processed for each source of mud from the seven different locations. The dried fibres were cut into snippet lengths then compressed into compact discs. The discs were then measured with a spectrophotometer and the “L\* a\* b\*” values recorded in a spreadsheet table, for comparative reference. The results of this analysis are presented in chapter three.

### **Visual and material analysis of cloaks in museum collections:**

Given the lack of secondary or archival sources, I decided to adopt another approach, a comparative visual and material analysis of taonga kākahu which might help link them to places of origin or acquisition by comparing the pattern, designs and/or hues of dyed

material with the dyed material processed in modern times. A comprehensive study was carried out on two selected collection items without provenance from the Te Papa textile collection store, and an eighteenth-century pauku (tightly woven cloak), housed at Durham University Museum, also unprovenanced. The analysis of the three case-study cloaks enabled me to reconstruct a detailed part of each of the textiles. The pauku was physically seen only once and, because of its location in the United Kingdom, further study was only possible with high resolution photographs.

Materials were collected and processed according to various elements of each textile.

1. Rāpaki Te Papa ME2086: Gathered harakeke leaves and processed into strips before removing epidermal matter to expose fibrous sections. Boiled leaf strips and hung up to dry. Treated the strips with tannin solution, hung up to dry. Dyed the leaf strips with iron-rich mud. Wove fibrous ends of lengths together.
2. Rāpaki Te Papa ME2085: Gathered harakeke leaves and processed with mussel shell to extract fibres. Plied lengths of fibres according to the twist of the original plied lengths. Treated plied fibres with the tannin solution, hung out to dry. Dyed fibrous lengths with iron-rich mud. Wove plied lengths together.
3. Pauku Durham University Museum: Gathered harakeke, stripped leaf into specific widths to produce amount of fibre to mimic the portion of fibre in plied lengths for both the warp and weft. Dyed wefts for tāniko weave; dyed with tannin source (hīnau) and iron-rich mud and another dye with tannin source (tānekaha) and iron-rich mud. Wove portion of kaupapa (foundation) of cloak incorporating undyed warp and weft, woven in close weave twining, then merged into tāniko, weaving with two colours of black dyed wefts and in part the undyed weft.

## Summary

In the first year of PhD study, the field work was scoped out and contacts made with iwi, landowners, and weavers, to both gauge their interest and offer a presentation of the project. There was no request for a presentation of the project so, instead, a consent form was distributed authorizing the collection of paru and related information and outlining the ethical obligations of the project. In all cases a phone conversation and/or email

correspondence finalized a suitable time to visit and collect. In the second year the field work was completed, and results of the forty-nine dye recipes of tannins and iron-rich muds dyeing muka fibres black, were prepared for colour measurements. The results of this field work are discussed in chapter three. During the research, on visits with iwi and in museum collection stores, documentation through notes and photographs was constant. Gathering various kinds of information provided a range of data that allowed me to theorize about characteristics typical to a region, thus a means of providing provenance for the many cloaks in museum collections. In the final year, the findings were analyzed and samples were woven. It is hoped that the detailed reconstruction of woven samples for each of the three textile case studies is a tangible piece of work that will allow the practitioner or weaver to observe and read, in an accompanying description, how this was done. An objective of the research was to connect people to taonga kākahu by transferring the mātauranga imbued in them.

The interdisciplinary research in this thesis involving museums, university doctoral research and partnerships with tangata whenua explores different approaches toward reconnecting taonga kākahu to tangata whenua. This project brings conservation techniques and responsibilities to the fore and engages with indigenous cultural heritage, inspired by Dean Sully's idea that conservation is ultimately about values and people not just material fabric (Sully 2007, 2015), and, moreover, needs to be participatory and empowering in relation to ongoing cultural practices such as weaving. It recognizes the urgency of reconnecting taonga kākahu to tangata whenua because of the poor condition of the cloaks and, just as importantly, the loss of identity experienced by descendants and their disconnection with those that made the taonga. In doing so, I develop ideas about museums as 'portals' which provide access to taonga for iwi establishing their relationship to kin identity and embarking on tribal cultural development (Hakiwai in Corsane 2005, Tapsell 2006, Hakiwai 2014). The mātauranga that is literally woven into the make-up of these taonga is a true testament of traditional Māori culture, and this knowledge needs to be recognized and embraced by its people.

The material culture of Māori and their practices of sustainable management are indeed applicable in today's world with the current Covid 19 pandemic and the threatening environmental crisis. Greater understanding of woven treasures in our museums can bring a

deeper awareness of indigenous ecological knowledge and practices that can assist future generations' responses to the challenges of climate change and pollution (Frandy 2018, Nicholas 2011). Identity is fundamental to any individual's life and for this universal task Māori culture can provide people with a wealth of connections not only to their genealogy but to all living things on this planet and, indeed, the universe.

## **Chapter outline**

Chapter one provides an overview and summary of the collections of taonga kākahu in museums of Aotearoa and briefly touches on the pre-European contact period examples of kākahu, mainly of traditional type, that are stored in museums overseas. It addresses museum practices and the role of kaitiaki and how museums are today advocating for biculturalism where Māori have input into the management and use of taonga kākahu. The background information in this chapter describes the processes of weaving from harvesting to the plying processing and then dyeing. An important process in the preparation is the cleanliness of the fibre and the exposure of fibre in millimetre sections like that of the pōkinikini analyzed in chapter four. Chapter one also discusses my family background as a weaver versed in the traditional knowledge of weaving, as demonstrated by my having woven two cloaks employing only materials and techniques of authentic weaving practices. This legacy and experience afford me the authority to conduct this research, an in-depth and balanced interpretation of traditional Māori weaving.

Chapter two investigates the preservation and conservation of taonga with reference to the fragility of the dyed black fibres. The stabilization of the black fibres is described in the engineering of a consolidation treatment as well in my master's research and the evaluation of that treatment. This chapter also discusses current museum practice in terms of collections management, interpretation, and storytelling around the kākahu that are displayed and those that are not displayed or have never been on display primarily because they are too fragile. I believe that regardless of their condition the taonga kākahu should be displayed, and not remain in storage indefinitely, therefore this proposal requires further discussion. I argue for the case of a traditional korowai, that dates to approximately early nineteenth century, that has not been displayed but only photographed for records. I argue that the fragility of taonga, such as the korowai, should not prevent the exposure of its material culture and the connection to whoever crafted it. This activist role has developed



through my experience with taonga kākahu and my realization that colonization has resulted in the separation of taonga and people, within and out of the museum.

Chapter three presents the data gathered from the field work where I engaged with communities around Aotearoa and spoke to them about their paru sites and where possible collected paru samples and dyed samples. The field work was conducted under the parameters of the university's code of ethics and the principles of kaupapa Māori methodology, that is, by, with and for the iwi, hapū and whānau involved. The paru samples were processed with the tannin-treated fibres to give a black colour. The black fibres were then examined with a spectrophotometer to measure the hue of the dyed fibres. The chapter includes the results of this work in comparing the different hues of the dyed fibres in relation to the land and the location and ultimately the people of the land.

In chapter four I show how I prepared weaving threads from the dyeing exercise carried out in chapter three. The lengths for both rāpaki (waist garment), although different in construction, were dyed with the same iron-tannate dye source, hīnau and paru sourced from Te Kuiti, the latter was chosen because it gave the darkest black. The dyed material for the pauku (warrior's cape) was from both Te Kuiti and Okiwi. The latter produced a red hue of black, as seen in the original construct of the pauku. This chapter allows me as a weaver to demonstrate my weaving skills and offer a new interpretation of the design of taonga kākahu.

The various findings of the research gathered through various methods, and the exposure of mātauranga are analyzed and discussed in chapter five. The field work presents some new findings that suggest a signature of black hue can be sourced from an iron-tannate combination that is typical to a region. This result supports some further research for more engagement with communities to identify where their source of iron-rich mud is and what tannin sources are available and possibly what these iron-tannate dye sources will produce in colouring their muka fibres black. The discussion also covers different measures that could be developed in our museums, as a decolonized and peoples-focused approach to conservation, for the exposure and/or display of kākahu that have for too long been kept in storage. It will also discuss how the museum can develop relationships with communities and practitioners to further enhance the mātauranga of taonga kākahu, and in doing so act as a portal to the past, present and future.



## Chapter one:

### Kākahu, whānau, museums

#### Introduction

The introduction to this thesis has provided a background context of how taonga kākahu remain disconnected from their descendants. It outlined the aims, questions and methods for the research which is about the reconnection of taonga with descendants, with reference to the early kākahu and their make-up. I reviewed the literature and described the methods chosen to gather data to address the research questions to do with connecting unprovenanced cloaks to people and land. Examples of the material subjects are depicted in the varied types of kākahu.

I begin this chapter with two cases describing the mana of taonga kākahu, so often neglected in the past, what they are and what they represent. The case studies are unique as they have significant history that is recognized by their whakapapa connections to tangata whenua today. In each case the museum plays an integral role of supporting the reconnection of taonga and tangata whenua. In the case of *Ngore Korowai*, described below, I was in the role of conservator charged with the task of stabilization and a courier for the people that whakapapa to the korowai. This chapter also describes the history of mahi kākahu and different taonga kākahu that are stored in museums that in most cases have never been brought out and are without connection to tangata whenua. With a strong background in traditional Māori weaving, I give a general description of each type of kākahu.

The first case study involves a recent iwi exhibition staged at Te Papa about the East Coast tribe of Rongowhaakata. One of their taonga displayed in the exhibition is the cloak *Ngore Korowai* which belonged to Te Kooti Arikirangi Te Turuki, a formidable warrior and prophet who was often chased by the British constabulary in the later period of the nineteenth century.<sup>12</sup> The korowai was loaned from Te Awamutu Museum for the tribal exhibition. At the end of its loan term the korowai was returned to Te Awamutu Museum,

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<sup>12</sup> “Te Kooti Arikirangi Te Turuki,” *Dictionary of New Zealand Biography—Te Ara*: <http://teara.govt.nz/en/biographies/1t45/te-kooti-arikirangi-te-turuki> (accessed 15 April 2021).

in the company of direct descendants of Te Kooti. As I was the conservator assigned to the dispatch and support for the transit of its return, my engagement with tribal members allowed me to speak about my observations and actions taken, the construction and the make-up of the cloak. As part of this duty, I disclosed the finer details of the cloak, such as the fine weave count of ten whatu stitches per centimetre, information which was shared with pride through social media. amongst the direct descendants.

The next case concerns a significant taonga kākahu that was returned to its tūrangawaewae (homeland) and people in the 1990s. In his article “The Flight of Pareraututu” (Tapsell 1997), Paul Tapsell describes the return of a kahukurī (dog skin cloak) from the Auckland War Memorial Museum collection to a marae then, eventually, to the regional museum of its people. I am fortunate to be an acquaintance of a descendant of the Rangitihi tribe from whom Pareraututu, the weaver of the cloak, descends. The story as told to me is that the kin of Pareraututu were lost in battle and she had gathered the kurī (Polynesian dog) of her slain relatives and made a kahukurī in their memory so named *Kahumamae*, the ‘cloak of pain’. She sought revenge for the loss of her kin and wore the cloak for days in silence in the company of an allied tribe, Ngāti Maniapoto, in the hope that they would take up her plea to seek revenge. It is not known if revenge was carried out, however the cloak remained in the possession of Ngāti Maniapoto until it fell into the hands of Gilbert Mair a prominent European active in the Waikato at that time. He eventually deposited the cloak with the Auckland War Memorial Museum. In his curatorial role, then at the Rotorua Museum, Tapsell researched the story of Pareraututu and the cloak of pain and advocated for the return to her descendants and tribe. Tapsell describes the return journey and ceremony and discusses the cultural significance of taonga, the inheritance of whakapapa and its associations for generations to come.

The reconnection of taonga with descendants, in my experience and described in the examples above, has a powerful impact and an everlasting impression that affirms Te Ao Māori. This reconnection does not expect an individual to follow or idolize a symbol or conform to a theology, but rather supports a consciousness of all elements in existence, it is not a religion, but a *culture*.

## **Ko wai au? A Māori museum conservator and weaver**

As a Māori I know my whakapapa and other whakapapa, and the associated names of tūpuna, of stars, of forces, of landmarks, events, creatures of all elements, which in my tribal region provide a framework of relations with people, things, and the environment, with the past, present, and future. The exploration of the Pacific by our seafaring tūpuna, who traversed the largest ocean on the planet, is considered one of the greatest feats of humankind. Yet, Māori have been subject to 250 years of colonization, having to comply and aspire to a culture foreign to their philosophical view of life.

As a museum employee I have an ethical and professional obligation to support and facilitate a connection between taonga and tangata whenua. It is my childhood tuition in traditional Māori weaving from my late mother and grandmother that have afforded me the background to follow a museum career and today, with some concern, I note that I remain the only Māori textile conservator. Te Māori initiated the training of several Māori conservators. In 1987 I was approached by the then Moananui a Kiwa Weavers to seek a career as conservator of Māori textiles. This would involve introductory training first at the national museum alongside textile specialists then completion of a three-year science degree in the conservation of cultural materials, at the University of Canberra, Australia.

As a Māori in the western construct of a museum, there have been occasions, while working with Māori in communities, when I have experienced a reservation towards participating in constructive dialogue about the care and manufacture of taonga kākahu. In some cases, the awe of the communities learning about taonga kākahu can be overwhelming, and often the experience is so foreign to their knowledge base that questions are not forthcoming. Further to this, is my feeling that some people are aware of my European whakapapa where my great grandfather, a surveyor during the nineteenth century, was involved in the land confiscations, as he was employed to stake out land boundaries for the confiscation by his European peers. His daughter, who chose to live with her Māori mother, learnt the craft of weaving and today is recognized for her contribution to the continuity of traditional Māori weaving. It is a mixed heritage, however, a whakapapa that affords me the foundation to contribute to the preservation of mātauranga.

In the role of conservator, I am very privileged to be close to the taonga of our ancestors and it is as a wāhine weaver that I interpret the mātauranga. This thesis presents some unique features of taonga kākahu that testify to mātauranga, exemplified in the material construct, weaving skills, and philosophy, reflecting an epistemology of Te Ao Māori. The literature for traditional Māori textiles presents, in most cases, overall descriptions with detailed technical features highlighted (Roth 1979, Pendergrast 1987, Mead 1969). This thesis, however, presents an internal study of the performing threads; whenu and aho, and their preparation which is functional and woven into a narrative. An attempt to extract the mātauranga of taonga of pre-European contact has identified weaving techniques not familiar to me, however the fibre preparation is achievable.

My upbringing, as one of twelve children raised on a farmlet five kilometres from a township, was simple in commodities but rich in values, including retaining respect for our elders and their practices to preserve whakapapa. My grandmother Dame Rangimarie Hetet, as a young woman, learnt the craft of traditional Māori weaving from her mother and maintained this skill up to her senior years, passing at the age of 103. Born in 1892 and married at the age of nineteen, she and her husband raised three children: two sons and a daughter. While adhering to good home living and the raising of her children on a small farm, she mastered the craft of traditional Māori weaving. Her weaving without any introduced materials contributed to the continuity of an otherwise lost form of cultural heritage. The Māori Women's Welfare League recognized this work as did the New Zealand Academy of Fine Arts, and she was awarded the Member of the British Empire, Commander of the British Empire and granted an honorary doctorate from Waikato University, as well as being made a Dame of the British Empire.

Her only daughter Diggeress Rangituatahi, my mother, also learnt the craft of traditional Māori weaving. Diggeress, like her mother, was committed to teaching the dying form of Māori weaving and in 1992 with the support of the Moananui a Kiwa Weavers, today named Te Roopu Raranga Whatu o Aotearoa, published *Weaving a Kākahu* (Te Kanawa 2005). The book proved popular indicating a resurgence of the craft. I witnessed a male weaver visiting my mother to show her the korowai he had made with guidance from her book, and I have seen several cloaks that resemble the construction and patterns that feature in the book. Diggeress also received recognition for her contribution to the continuity of

traditional Māori weaving and was granted an honorary doctorate from Waikato University and was awarded an OBE, and an MBE.

Exposed to the gathering of materials, namely harakeke and barks for dyeing, and the processing of them, I was intrigued by my mother's and grandmother's endurance in labouring at the many processes required and weaving for many hours, before completing a kākahu. The regular preparation of harakeke, extracting muka with the use of a mussel shell, then plying the fibres on the thigh for both warp and weft threads, appeared to be a laborious task, as was the binding of thousands of individual feathers to make a bundle of three feathers, ready for weaving into the central foundation of the cloak. These tasks, to name only a few, took many hours, however, both women, of their own accord, contributed to the continuity of a traditional weaving practice that had been almost lost. I did not make a kākahu until I was middle-aged, perhaps not warming to the laborious tasks at a younger age. I have woven two kākahu employing traditional weaving techniques and using natural materials and dyes, inspired by the many kataika I've had the privilege to examine. What remains a permanent impression has been the elongated diamond shapes or lozenges in the decorative tāniko borders. There are so many different designs within the lozenge. I have developed a novel pattern woven as a decorative supplementary weft that was inspired by the lozenge designs (Figures 3 and 4). I was also inspired by the border of the kahukurī and wove this along the lower border of my second kākahu (Figure 4). My family background and my position as conservator have given me personal possession of a kaitaka paepaeroa that was presented to my family in the early twentieth century and remains today one of the finest kākahu I have seen with a weave count ranging from ten to twelve whatu stitches per centimetre (Figure 5).



Figure 3. First kākahu, *Tiakiwai* (Water care).



Figure 4. Detail of supplementary yellow aho and twill weave.



Figure 5. Detail of weave count on family kaitaka paepaeroa.

Taonga can be a confirmation of who you are. Such was the reaction of my sister to the first cloak I wove. She was speechless and emotional. She explained that she was moved because the cloak reminded her of our dear grandmother and mother—her whakapapa. This reaction toward my cloak was, indeed, a compliment and great recognition for me as a weaver. I also have been moved when in close contact with taonga kākahu of historical content that are enriched with mātauranga. Initially, I am speechless in awe of the craftsmanship and then emotional because I know of the disconnection between the descendants and the taonga. After the emotion I am excited to examine the cloak and to talk openly about what has been observed and discuss with others the material composition and construction.



## **Mahi kākahu: History and practice**

The exposure and/or display of historical Māori textiles in museums has for the most part, prior to the late twentieth century, been relatively low-key. Up to this time Māori textiles were mostly recognized as the piupiu (waist garment), pare (bodice and headband), and a few kahu kiwi (kiwi feather cloaks), which were erroneously called ‘korowai’. In my youth in the 1970s, no one had heard of a kaitaka, for example. I believe this indicates how distanced Māori had become from their material culture, in this case their traditional costume. The restoration of this view of life lies in the mātauranga of taonga.

### ***Te Whare Pora: the house of weaving***

The weaving of Māori textiles was for the main part the work of wāhine. At an early age and identified by a tohunga (priest), the taura (pupil) weaver was under strict tutelage for weaving a kākahu, in the whare pora (weaving house or domain) (Best 1898, Mead 1969). The weaver would have demonstrated a certain characteristic of concentration and execution worthy of the directions of her tutor. The weaving of the finer kākahu such as the kaitaka and pauku would have been under the tutelage of a tohunga (priest) for in this work an assemblage of elements creates the pattern and narrative. The simpler forms of covering such as the pākē (rain cape) or rāpaki are not as intricately woven, as in some cases weft rows that make up the foundation are less than twenty, unlike the kaitaka for which hundreds of weft rows are woven. Māori mastered the craft of whatu, raranga and dyeing of harakeke to fashion their clothing and functional items. In this practice an observance of tikanga acknowledges the material resources of Tane Mahuta (the forest kingdom) for the gathering of plant materials, and the iron-rich mud from Papatūānuku used to dye the fibres black. This practice acknowledges whakapapa and respect for all living things.

It is the duty of the weaver to harvest from the ngahere, gather the harakeke, collect the hīnau bark and paru and process and prepare the leaf and/or the fibres. The extraction of the muka uses only a mussel shell, the only tool employed through the whole course of making a kākahu. The weaver decides the function of the kākahu and accordingly prepares strips of leaf at a certain width for extraction of the fibre that will produce a certain amount of fibre to be plied into the threads—a measured exercise working with hundreds if not thousands of leaf strips—followed by the plying of the threads with either a soft or tight

twist, for both the whenu or aho. A calculated measure of leaf strip, and the thread twist can be woven into a strong kaupapa (foundation) for a particular kākahu for example the pauku or a loose twist to give form for the kaitaka.

The whenu is also named ‘Io’ and is the material connection to the supreme being, the most sacred being in the cosmos. The weaving of whenu establishes connectivity through downward threads or pillars of connectivity from Papatūānuku to the beginnings of Te Ao Māori. The aho twines the whenu in a binding stitch (whatu) that connects the pillars together to form the kaupapa foundation which comprises many layers of all things of existence. As it is the tahuhu (the first weft thread that weaves the whenu), it is the ontology for reciting whakapapa, whereby the weaving of each whenu with the tahu represents the connecting of descendants or pedigree (McCarthy 2019). The weaving of whenu and aho provides a theorized methodology for the recitation of whakapapa. Employing such a method of reciting whakapapa has contributed to the retention of whakapapa.

### ***Eighteenth-century kākahu***

The majority of kākahu of the pre-contact and contact periods are in Europe, one such example, a mahiti (cloak with dog fur bundles) is held at the Pitt Rivers Museum (Figure 6). Accounts of taonga kākahu acquired by early Europeans describe the collections as having taken place in general locations related to provinces. In most cases no account of the tribal affiliation is recorded, and, under the circumstances, the exchange of goods was seen to be a modest transaction. Taonga kākahu have, for at least two centuries since their acquisition, remained disconnected from Māori, generations after the event. Currently, Māori researchers are researching taonga kākahu held in museums in England, with the objective of extrapolating mātauranga Māori to present to Māori today. Similarly, our weavers and researchers have described and attempted to replicate, historical taonga such as ‘Te Rā’, the sail held at the British Museum. In their research of taonga, Tamarapa and Blackman have developed strong relationships with custodians of kakāhu overseas, visited their respective museums and acquired images and records (Tamarapa 2019, Blackman 1995, 1998).



Figure 6. Mahiti circa 1780. Courtesy, Pitt Rivers Museum, Oxford.

### ***Nineteenth-century kākahu***

The nineteenth century brought significant change to Māori culture. The situation for Māori was rapidly altering to accommodate forceful European settlement that compromised their living status and, importantly, their identity. By the mid-nineteenth century, the Māori population was in the minority. The Treaty of Waitangi sovereign legislation of partnership between the British Empire and Māori was, in fact, the founding document that imposed irretrievable loss for Māori who lost land and mana.

The confiscation of Māori land and its clearing for agricultural development also depleted the natural resources that fundamentally sustained the Māori cultural way of life. Felling of forests and engineering of rivers for irrigation of eventually led to a country of European wealth and governance. This century brought the disconnection of Te Taiao, Te Ao Māori and taonga kākahu for Māori. Land confiscations led to Māori conforming to a new western construct and cultural practices, including language.

From the time of contact with the European, Māori weavers experimented with colourful wools, such as the bright Berlin wools, and incorporated these yarns into the decorative tāniko borders, sometimes stitching the wools over the original natural dyed muka threads. The candlewick cotton threads replaced the whenu in the kaupapa, and many cloaks were made

entirely of introduced materials. A good portion of the kākahu in our museums are representative of this period of adaption. Kākahu of these first few decades are recognized by their larger size, craftsmanship and materials. Kākahu of the mid-nineteenth century are represented most in collections as smaller and, notably, with narrower tāniko borders and predominantly include examples of kahuhuruhuru (feathered cloaks). Toward the end of the nineteenth century, kākahu exhibited introduced materials such as candlewick and wool and again were much smaller with narrow or no tāniko borders. By this time Māori mainly wore European clothing which, in the main, replaced the blanket that had earlier replaced the cloak.

### ***Twentieth century kākahu***

By the beginning of the twentieth century, traditional practices of weaving kākahu had almost disappeared and the adaptation of European materials was more frequent in what weaving remained. Most common in weaving were garments made for performance groups for the tourism industry, such as the piupiu and smaller items that did not involve the complexity of the making of kākahu. Only a few weavers kept their hand in at traditional weaving and maintained the practice of procuring natural materials for processing such as harakeke and plants for dyeing muka.

### **Types of kākahu in museum collections**

The korowai was the more common attire in traditional times, unlike the kahukurī or kaitaka that were worn by rangatira (men of status). With the demise of our spokespersons, through loss of status during early colonization, and fewer cloaks of mana, the most common mantle worn amongst Māori was the korowai.

By the beginning of the twentieth century, almost all Māori cloaks were named korowai. Admittedly, I was not aware of kākahu other than that of korowai, before my career in the museum. To name a few, the kaitaka, kaitaka paepaeroa and kahutoi had not been spoken of, in the mid- to late twentieth century. It is important, therefore, given this common misunderstanding of taonga kākahu, to clearly describe here the variations of kākahu, what they represent and their general material make-up (Tamarapa 2011).

## 1. Kahukurī

Te Papa holds the largest collection of kākahu, and within the largest number of kahukurī, seventeen of which three have provenance. They are prestigious because the kākahu is adorned with strips of skin and fur of the kurī—the dog that accompanied early Māori on their voyage from their former homeland of Hawaiiki (Figure 7).



Figure 7. Kahukurī. Courtesy, Te Papa Tongarewa.

They vary from contrasting white and dark brown fur worked in vertical bands across the foundation to an all-dark fur with contrasting white fur at the sides. There is one that features all white with thin dark strips down the sides.

Numerous categories of kākahu are recorded (Neich 2013) and there is some variety within those categories, for example the kahukurī can be further categorized as:

Kahukurī—Generic name for cloak adorned with putahi (strips) of kurī-dog fur or skin.

Kūparu, Kōpara, Kūpara—A black dog skin cape.

Kuriawarua—A cape covered with long hair of dogs.

Ihupuni—A dark dogskin cape.

Reko—White dogskin cape.

Waero—Cape covered with dog tails.

Mahiti—Kākahu dotted with tufts of bound kurī fur.

The kahukurī lent the wearer recognition as being of status and as the spokesperson representing a people or tribe. Woven with warp and weft threads of plied fibres of dressed harakeke, it is notably woven with no ara (spacing) between weft rows. One such kahukurī measures 1430 mm wide and 1220 mm high. The weave count is approximately seven to eight single pair twining per centimetre and at approximately 1.5 mm per stitch measuring seven to eight weft rows per centimetre. It displays a complete coverage of strips of kurī skin and fur both the dark brown across the top directly under the kurupatu (collar) and narrow strips, one each, at the sides. The strips are attached with plied muka threads and each of the strips measures approximately 1 cm wide, some are slightly narrower. The outer edges of the kākahu, down the sides and across the top of about 15 mm wide is a narrow band worked in twill weave of natural and dyed black muka (Figure 5). The twill work is interesting in that it is technically different to the more common twining stitches. This twill work is also recognized in some early European textiles, such as the more recent excavated fragments from a cave in Slovenia (Grömer 2017, 215).



Figure 8. Detail of twill weave at side edge.

The attachment of the kurī strips does not give any impression on the reverse of the kākahu. This implies that the working of the attached strips is carried out through the stitches of the foundation and could indicate that the strips were attached or stitched on after the foundation was woven. Another kahukurī with a distinctive pattern has three narrow dark brown kurī fur strips down the sides and a block pattern directly under the kurupatu which is slightly convex along the upper edge due to the additional weft rows or aho poka worked over the main part of the foundation. It also features a very narrow twill weave band down the sides and top edge, with a neat, plaited finish. The kurī strips attachment with the plied fibre, does not appear to make an impression on the reverse, this also implies that the strips were added after the foundation was woven. The strips on this medium-sized cloak are noticeably narrow measuring approximately 5 mm in width.

In another kahukurī, possibly an ihupuni, the adornment is mainly of the dark brown kurī strips. It is small in comparison and has a convex kurupatu and measures approximately 1200 mm across the top and is 750 mm high. A lot of the kurī strips have become detached along the top edge and in a few places over the kaupapa. This condition requires local humidification of the detached strips to enable them to be relaxed and manipulated back into position and secured in place with a stitch. Technically this kahukurī differs from the two previously described because there is an impression seen on the reverse like a slight

recess in the weave, which corresponds to the plied thread that attaches the kurī strips to the foundation on the front. This impression, or attaching of strips technique, implies that the strips were added during the weaving of the foundation. Another kahukurī also displays this technique, visible on the reverse. The textural difference between strips attached after the foundation is woven and those attached whilst the foundation is woven is discussed by Roth who writes that men were employed to attach the strips to the foundation as the tight weave of the tightly woven weft rows of impenetrable function proved difficult for a woman's hand to work.

There has been some research work carried out on the kahukurī (Balance, 2015). The research employed the scientific application of isotope analysis, to identify the diet of the kurī by taking single hair samples from the strips of kurī. The results identified how many dogs' fur covered the kākahu and what dietary habits the dogs had. The hypotheses of this research determined the rank of the kurī as highly respected by Māori because, as previously mentioned, they accompanied early Māori from their former homeland, and may well have been fed accordingly a better diet, as a special pet.

The kahukurī through its construction provides the wearer with an impenetrable surface of tightly woven weft rows and this functions as a protective cover, therefore the kahukurī is recognized for both its mana (status) and its provision of protection for its esteemed wearer. The kurī fur or strips are considered sacred and are seen on taonga such as the neck of the taiaha (long wooden weapon) and on some of the earlier kākahu added as bound tufts in the corners or attached as strips to signify the connection to the old world or that which came before the arrival at Aotearoa. Reference to a moteatea that acknowledges the attachment of putahi to the corner of the kākahu, is outlined in the introduction as in the case study of the pauku, described in chapter four, that once had an attachment of bound kurī fur.

*Ka mau, whakaarahia i te pūtahi*

*When firmly fixed, fasten the topside of the pūtahi*

(Pūtahi, in full *Te Waero Pūtahi*, a dogskin cloak.)



## **2. Kahutoi**

The kahutoi, made with the durable toi (*Cordyline indivisa*) fibre is the warrior's cape and, notably, is dyed all in black as a camouflage in times of battle at night. The kahutoi is not as intricately woven as the impenetrable kahukurī, however, the strength of toi fibres makes for a surface impenetrable to a wooden weapon. It is of a relatively medium size of 1220 mm wide, slightly convex across the top and approximately 800 mm high. The kahutoi weave is worked in single pair twining and does have a spacing between weft rows varying from 1 cm and the weave count is approximately three whatu stitches per centimetre, relatively coarse, however the make-up of the foundation, as pointed out above, provides a suitably impenetrable surface for a warrior's cape. The top edge is neatly plaited.

## **3. Aronui**

The kaupapa has no adornment, it features only the finely worked weft rows of closely woven whatu stitches with a weave count varying from seven to eight stitches per centimetre and spacing between weft rows of approximately eight to ten millimetres apart. It is interesting to note that the whenu appear to be not plied and between weft rows a characteristic wave-like appearance is observed. For the weaver of such a kākahu the skill level is high, certainly challenging for the modern weaver today, however, the traditional weaver with high levels of concentration and without distraction as well as with astute manual dexterity has produced a fine account of weaving. As a weaver of modern times, the weaving of plied whenu or warp threads present themselves for picking up with, in my case, the index finger. However, I cannot comprehend how so many thousands and thousands of whatu stitches seen on the aronui, are uniformly woven in fibrous form, not plied. The twining is worked in double pair twining and all weft rows appear of equal tension and spacing, with the wave-like appearance between weft rows due to the fibrous form. It is often asked if more than one weaver is employed in the making of such a kākahu, this is not known, however the regular weaving tension and uniformity suggests that it is the work of one weaver.

The aronui has a narrow tāniko border at the sides of approximately 15 mm, and a deeper lower tāniko border at the remu of approximately 230 mm deep that is trimmed heavily with bound tufts of kurī fur, a significant feature. The pattern in the tāniko border appears

to have been embellished later with wool of various colours, originally it could well have been worked only with the black, brown, and natural muka. Aho that are not woven to the face of the tāniko are seen carried across the back of the work, however this is not seen with the wool elements on the aronui tāniko, which suggests that it was added later, the wool also appears raised above the muka wefts.

What is seen in the tāniko border is a bold central pattern of Aramoana, the sea pathway, and at either side the elongated lozenge pattern. The tāniko weave is fine with a weave count of ten whatu stitches per centimetre and six to seven weft rows worked every centimetre. In between the lozenge patterns is the ‘black on black’ work which appears as a slightly recessed black work. Certainly, in a raking light it will give the appearance of a darker and compact black recess weaving, a subtle appearance but a fine example of technical application working the weft thread at a different twist, to that on the face and resulting in a different texture.

#### **4. Kaitaka**

The kaitaka, is a finely worked kākahu like that of the aronui, it displays only the fine weaving without adornment over the foundation and the weft rows appear from side to side. Tāniko borders are usually deeper along the remu than at the sides and again, like the aronui, it is an intricately woven piece. It is estimated that the tāniko border, with finely worked dyed weft threads sometimes woven over supporting passive wefts, is equal or more than the weaving work in the main kaupapa foundation of the kaitaka.

#### **5. Kaitaka paepaeroa**

The kaitaka paepaeroa features the vertical weft rows in the finished product. Although it is woven with weft rows worked from side to side, the finished work places the weft rows from top to bottom. The weft rows vary in spacing between rows and the preparation of the whenu can be either plied or not plied. The shaping for the rather large in comparison, kaitaka is also clearly visible.

I am fortunate to have in my personal possession a kaitaka paepaeroa, worn once by my mother at the age of seventeen for a photo shoot. Unfortunately, the wide tāniko borders were lost because of water damage causing the deterioration of the black fibres. The foundation did, overall, retain its form and is an excellent example of fine weaving. The

weave count is eight to ten whatu stitches per centimetre and spacing between weft rows varies from three to five millimetres. The shaping rows—aho poka are impressive, with three groups of each with thirty-six aho poka

The overall common feature is that the skill of the weaver is on display without any material covering and, therefore, the aronui, kaitaka and kaitaka paepaeroa are excellent examples of traditional Māori weaving.

## **6. Korowai**

The korowai is a Māori cloak adorned with black thrums of hukahuka (plied muka) woven into a natural foundation (Figure 9). The korowai was the more common attire in traditional times, unlike the kahukurī or kaitaka that were worn by rangatira (men of status). With the demise of our spokespersons, through loss of status during early colonization, and fewer cloaks of mana, the most common mantle worn amongst Māori was the korowai.

The korowai is a kākahu adorned with black thrums either plied thrums—hukahuka or unravelled plied thrums—kārure. The taonga, WE1892 housed at Te Papa is a very impressive example of a korowai that is heavily adorned with hukahuka, very finely plied black thrums. The twist angle varies on the plied thrums however, some appear to be at a 45° angle (Figure 10). Also incorporated in the foundation of the korowai are highlights of thin lengths of pōkinikini. The korowai foundation is woven in double pair twining—whatu aho rua— and is worked at eight to nine stitches per centimetre (Figure 11). The spacing between weft rows varies between five and six millimetres.



Figure 9. Korowai WE1892.



Figure 10. Finely plied twist angle.



Figure 11. Eight to nine whatu stitches per centimetre.

The kurupatu (collar) is thick with the black hukahuka and incorporated, randomly placed, are very thinly worked pōkinikini. The top edge is neatly plaited in what appears to be a four plait and sits relatively flat considering the volume of plied fibre lengths in the front.

The korowai is referred to as a common cloak, traditionally worn by common folk and for this reason it is likely that the term korowai was more often used to name kākahu as it is today. It is interesting that a common cloak would entail so much work, as seen in the finely plied lengths varying in length from 150 to 200 millimetres long. Thousands of these

lengths ranging from 1.5 to 2 millimetres thick, are manually plied and individually attached with a whatu stitch onto the foundation, and several are plaited into the neat top edge to amass the kurupatu. The preparation of the hukahuka—plied and dyed, whenu and aho plied—before the many, many hours of weaving is, for the modern weaver like me, incomprehensible. The common korowai demands much thought and planning, a level of commitment and concentrated efforts on so many counts.

The plied black thrums and thin pōkinikini can be each seen on the case studies of the two rāpaki described in chapter four. From this, I surmise that the korowai was developed after the rāpaki and that early Māori who arrived in Aotearoa crafted a waist garment in the simplest form of joining two elements warp and weft and developed from this the more refined warps of pōkinikini and hukahuka woven together with either a single or double pair twining stitch.

## **7. Pehipehi**

The Pehipehi is fabricated with leaf strips that are woven into the foundation by fibrous ends and are strategically placed with the waxen surface of the leaf strip, outermost. The waxen surface repels the water and is suitable for its function as a rain cape. Early Europeans (Roth 1979) described first encounters with Māori wearing thatch-like capes. Simple in construction, the pehipehi could be woven in a relatively short time, an estimated day or two. It is likely that further development into a refined type of pehipehi would be to fashion the more detailed rāpaki, with plied lengths of dressed harakeke fibre dyed or lengths of pōkinikini with dyed fibrous sections. This is discussed further in chapter four.

## **Interpreting elements of weaving**

Within the construction of some of these select Māori textiles, references to Te Taiao, and indeed to Te Ao Māori, are integral. The adornment of the foundation or kaupapa of the kahukurī retains the connection to the former homeland from which the Polynesian dog or kurī originates. It recognizes the mammoth sea voyages by which our tūpuna came and brought with them the Polynesian dog. Within the tāniko weaving are names of various designs, patikitiki the flat fish-flounder appears in the deep decorative borders of the kaitaka and aronui, worked to the side of the central Aramoana pattern—Ara-path, moana-sea. In the weaving of the downward warp (whenu) as noted above, is reference to Io (the

sacred name of the Supreme God) the pillar to the supreme (Best, 1934, 194). For this the many whenu need to be woven together to form the kaupapa, by the whatu or twining together with the sacred thread, te aho tapu.

In the procurement of whenu and aho, the muka fibres are plied to a certain twist angle, like that in the hukahuka of the korowai, so that after a century or more of time they will still retain their tight twist. A firm twist of the whenu and aho would also contribute to the strength of the impenetrable kaupapa of the kahukurī and the kahutoi, and provide protection for the wearer.

In the procurement of the fibres to make the whenu and aho, the physical execution to expose the muka fibres from the leaf of harakeke employs the action of haro, which means ha—take the breath and gather strength, ro—long, applying strength with the mussel shell over the long leaf to extract the fibres. The make-up and meaning of taonga kākahu hold mātauranga that supports a means of retaining identity, these elements will be interpreted in the examples in chapter four.

## **Disconnection**

The connectivity to Te Ao Māori was lost by the mid-twentieth century and Māori health seriously declined through having to adapt to a European diet with the introduction of dairy products and sugar. So many aspects of the Māori culture were lost and/or compromised resulting in an inequality of life in this modern world. The demise of traditional Māori weaving began at the point of European contact. In the first few decades after contact, Māori experimented with European materials introducing them into the weave of their kākahu and, later still, the new materials made up the foundation of cloaks. Further to this, sourcing of European fabric and clothing became an alternative means of clothing themselves. With a predominantly European population in the mid-nineteenth century, Māori nuances and cultural practices were less prevalent. During this period, amid the New Zealand wars and, indeed, within inter-tribal conflicts, Māori struggled to maintain their traditional cultural practices, a sustainable and respectful lifestyle as existed pre-contact.

Recognizing the disconnection from a traditional sustainable way of life and the mātauranga Māori of taonga kākahu pre-contact, this research sets out to extrapolate the

mātauranga and make it known to Māori by examining the construction and material processes of taonga kākahu.

### **Harakeke is a taonga (hara—excess, keke—strong)**

Māori people made their home on the last inhabited land on earth in about the eleventh century (Anderson 2016) after their intrepid voyages across the largest mass of sea on earth. The land of the long white cloud, Ao-tea-roa, was first sighted and named by Hine-Te-Apārarangi, on her watch from a voyaging waka (canoe) Māori settlement was mainly in the North Island, some 700 years before Europeans arrived (McKinnon 1997). Adapting to their new environment, which was colder and harsher than conditions on their former Polynesian island homelands. Māori established efficient practices for shelter, food gathering, agriculture and clothing. The tools, implements and material resources Māori used in their sustainable and managed existence made an impression on European observers on first contact (Roth 1927, Best 1898). Amongst other plant materials, Māori realized the potential of harakeke and processed the leaf and fibre into various functional items, such as clothing (Pendergrast 1997).

Used extensively by Māori, harakeke was and continues to be a plant of great mana in Māori culture. Harakeke is the one material resource that is forever with them. It is spoken of when someone passes that they shall return to their pā harakeke. We speak of the strength of harakeke and the fibre muka woven into a cord that was used to pull down Te Rā by Māui. It has immense strength and beautiful sheen and is recognized as one of the five strongest natural plant fibres. Due to these properties, it was essential in Māori culture. In an historical account of two Māori men who travelled to United Kingdom in the nineteenth century, one is reported to have remarked that he could not live there as there was no harakeke.

At contact period the first painting of a couple—European and Māori—that hangs in Government House, depicts the tattooed Māori male with a whiri (skein) of muka in a gesture of handing over to the European corporal. As Europeans took great interest in the muka that was woven into the silken “mats” (Roth 1927) that adorned Māori ancestors, they explored the potential of developing a textile industry, carrying out a nineteenth-century research project investigating the plant’s habitat, varieties, and properties. Some of this

work, including the writing of William Cross, is still referenced today. Cross catalogued as many varieties of harakeke as he could obtain, describing the width of the leaf, the colour of the mid-rib and keel, the use of the plant and the Māori name. Māori named each of their own harakeke and today documentation by Rene Orchiston titled ‘The Rene Orchiston harakeke collection’ lists sixty-three varieties with descriptions of the leaf type, fibre quality and use. Rene met with my mother and grandmother to catalogue the variety of harakeke they used for their weaving, which is typical of the Maniapoto rohe—mainly taeore and kohunga.

Most New Zealanders relate to harakeke, New Zealand flax, *Phormium tenax*, native to Aotearoa and Norfolk Island. It is iconic as a backdrop graphic for many a view. It has a whakapapa to Papatūānuku and Ranginui who begat the god of the forest Tāne-mahuta, from whence came Rehia then harakeke. As noted above, there are two main species of New Zealand flax—*Phormium tenax* harakeke and *Phormium cookianum* wharariki. The two differ in the form of their seed pods; the former have pods that point upwards whereas the latter point downwards. Harakeke is found mainly on lowland areas while wharariki is common in mountainous or highland regions.

All harakeke plants appear to be the same from a distance, however, on closer examination, there are apparent differences. The degree of greenness varies from light to dark and leaves can be variegated with reddish or yellow stripes. Furthermore, the leaf can grow to be a rigid upright form or a dropping form. The variation in leaf growth is relative to the soil type and climatic condition in which it grows. Geographically, the landscape and climate differ from the warm Far North to the colder southern plains. My sister took a division from the family pa harakeke and planted it further east and approximately three hundred kilometres away near the coast. It yielded a different quality of fibre.

Manaaki Whenua Land Care Research, a government department, has developed an extensive information database of many of the harakeke varieties describing their natural habitats and properties. Otago University engaged with weavers to qualify and quantify the features of several types of harakeke in 2006 (Lowe 2009). The research noted the ease of extraction of muka and the fibre length. These are properties that are sought by the practitioner. The variety that produces the coarser fibres releases more readily while, in



contrast, the thinner fibres require more processing to be extracted from the epidermal and green matter and are more embedded in the green of the leaf.

There is much to say about the nomenclature of flax, weaving and related terminology and its retaining of mātauranga Māori. Māori have named many different aspects of Te Ao Māori, place names for example, including the longest place name in the world, in Hawke's Bay:

Taumatawhakatangihangakoauauotamateaturipukakapikimaungahoronukupokaiwhe  
nuakitanatahu/The place where Tamatea, the man with the big knees, who slid,  
climbed, and swallowed mountains, known as 'landeater' played his flute to his  
loved one<sup>13</sup>

This place name recognizes a place, a person, and an event and it remains with us today. There are other names relating to a dwelling, also in Hawke's Bay, for example, a marae called Pakipaki, which is also the name of cloak with distinctive narrow tāniko along the hem line wider at the sides (Best 1898). A marae in the Heretaunga plains is called kākahu. As I've travelled throughout the North Island, I have noted roads called hīnau and pōkākā, both trees from which barks are sourced for their tannins. A place in Northland is also named pōkākā. Our tūpuna did retain mātauranga through naming places and people. I was surprised to learn the meaning of my own name Rangituatahi—of the tenth heaven, relatively late in my life, nevertheless, I was fulfilled by the knowledge that my name carries the connection to the heavens and the cosmic realm. The name Rangi—Sky Father is most prevalent in the Māori language and there are numerous uses of it; Ranginui—the big sky, Rangimarie—peace and Rangiaho—sky thread.

The objective of this research is to reconnect modern Māori to traditional Māori culture through greater understanding of taonga kākahu, and to help restore their identity (while trying at the same time through conservation to restore the taonga in material terms). This connectivity was seen traditionally in the observation and study of all living things upon the land, and the recognition of the layers of different existing forms of nature. This practice

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<sup>13</sup> See: "Longest place name in the world—Hawkes Bay places," *Te Ara Encyclopedia of New Zealand* <http://teara.govt.nz/en/music/24219/Longest-place-name-in-the-world> (accessed 30 March 2021).

was essential for Māori to sustain a natural way of life. Māori were master gardeners; they would study the quality of soil based on its properties and from this prepare for what would produce a healthy crop. Maramataka, the study of the lunar forces for the times to plant and harvest crops, was observed and, through this practice, Māori recognized that all elements of not only planet earth but also the entire universe were relative. However, this relationship of people to the land was interrupted by colonization, and in the process Māori cultural heritage was alienated and ended up in museum collections in Aotearoa and overseas.

### **Museums and weaving**

As I showed in the introduction, museums in Aotearoa have, during the last four decades, come to terms with their colonial origins and advocated for the reconnection of taonga with their descendants. Initiated by Te Papa, the recognition of taonga and their respective descendants has become an integral part of management through the policy of mana taonga (Hakiwai 2018, McCarthy 2011, McCarthy 2018). Te Papa's predecessors were very much in line with conventional museology in collecting and displaying the culture of the 'other' through western ethnological perspectives, namely the Colonial Museum founded in 1865, the Dominion Museum which opened in 1936 in Buckle St, Wellington, and renamed the National Museum in 1972 (McCarthy 2018). Weaving was not considered as important as carving, and museum staff such as Augustus Hamilton often referred to cloaks as 'mats' (McCarthy 2007). Nevertheless, the Māori collections were very large, including the most extensive range of more than 300 kākahu. By the 1970s and 1980s, concerns were expressed as to how taonga Māori were stored 'in the basement' and about the lack of consultation with tribes. Indeed, the storage space housing the kākahu collection was no more than the size of a large bedroom. Storage systems were upgraded in the mid-1990s and in 1998, when the institution relocated to the Wellington waterfront in a new, reinvented Museum of New Zealand Te Papa Tongarewa.

Much of the change that culminated in Te Papa resulted from closer engagement with tangata whenua and arts practitioners such as carvers and weavers after the *Te Māori* exhibition held from 1984 to 1987, and subsequently the employment of Māori staff. In general, the success of this exhibition abroad alerted museums in Aotearoa to the cultural significance of taonga and showed the gap between them and those inherently connected to them. *Te Māori* brought awareness to museums and iwi alike and, indeed, was what

initiated the introduction of Māori people into museum careers, as was the case for me. The visitor numbers were impressive, including a greater number of Māori visitors to New Zealand museums (McCarthy 2007). Many Māori visitors spoke of their restored pride and cultural identity when they visited the exhibition, and from this time the museum sector encouraged and supported Māori in visiting museums and participating in the management and care of taonga both inside and outside of museums.

Ironically, *Te Māori* did not include kākahu, however, upon the exhibition's return to Aotearoa as *Te Hokinga Mai*, the then National Museum displayed a selection of traditional kākahu in a nearby smaller gallery space. This oversight was corrected by later exhibitions which did include textiles made by women. One notable example in 1990 was *Te Aho Tapu* curated by Mick Pendergrast at the Auckland War Memorial Museum, where an impressive collection of mainly nineteenth century kākahu was displayed. The catalogue for *Te Aho Tapu* (Pendergrast 1988) gave an excellent technical account of the items, from which nomenclature of kākahu became standardized. This publication became for many practitioners the go-to reference for kākahu terminology such as 'kahuhuruhuru', although it was not applied as often as it should have been. And, as previously noted, the widely used and incorrect term 'korowai' was used for any cloak even with the complete adornment of feathers. *Taonga Maori*, another exhibition which followed *Te Maori* at the National Museum in Buckle Street from 1989 to 1990, did include taonga kākahu. This exhibition toured Australia and received a profound response from Māori residing there, with feedback expressing their restored pride in taha Māori (McCarthy 2011).

In 1998, the newly opened Te Papa provided more exhibition spaces, the *Mana Whenua* exhibition occupying most of level four along with the contemporary marae and an exhibition about the Treaty of Waitangi, so that kaupapa Māori was paramount. Te reo Māori accompanied texts in exhibitions, and blessings and karakia were recited at exhibition openings and at closings. From the mid-2000s, kākahu from the collection store have been used at ceremonial occasions, particularly at repatriation ceremonies when human remains were returned from overseas. The mauri of the taonga, their spiritual and tangible presence, connected Māori to their ancestral whakapapa and mātauranga Māori (Mead 2003). Biculturalism, while a relatively new philosophy bringing together two cultures in one country (McCarthy 2011), enabled a more robust Māori presence in the new

museum. Māori played an integral part in the decision-making for exhibition developments and acquisitions. Māori also, by this time, had been trained in conservation in Australia, including myself, in textiles, Dean Whiting, Nick Tupara and Rose Evans in objects and Vicki Anne Heikell in paper. Today there are eleven Māori conservators that I know of. In comparison with other countries of much greater populations of indigenous peoples this number of indigenous conservators for Aotearoa measures up well.

There was more weaving on display in the new building at Cable Street than at Buckle Street, but limitations persisted. The *Mana Whenua* cloak case was, in my opinion, too tall and could accommodate only two custom-made, male mannequins, slightly elevated supports for flat fragile textiles and a few ornaments. The case has, over time, accommodated the various iwi exhibitions textiles that include temporary loans and collection items, the former varying in dimensions to the usual. As in other leading New Zealand museums, kākahu were shown within a narrative of overall Māori culture rather than in a display of specifically traditional Māori costume in its own showcase. The kākahu that featured were mainly of the mid-nineteenth-century period with few dating any earlier. So, it was for the kākahu in the *Mana Whenua* exhibition space in Te Papa that for opening day in 1998 displayed the crème de la crème of its collection yet succumbed to display parameters and conservation rules requiring changeovers every six months and limits on the selection, partly due to the condition of the cloaks. Other Māori textiles were shown in the *Mana Whenua* cloak space display—piupiu, kete and whāriki and, eventually, contemporary works with the introduction of iwi exhibitions every two to three years. In all they displayed taonga kākahu both historical and contemporary from respective iwi.

*Kahu Ora: Living Cloaks* was a unique kākahu exhibition held at Te Papa in 2012 accompanied by a major catalogue edited by the curator Awhina Tamarapa (2011). A selection of both traditional and contemporary Māori textiles was on display with an emphasis on connecting people and families with kākahu. The exhibition space of the Platinum Gallery on level 3 previously showcased a touring exhibition *Unveiled: 200 years of wedding dresses from the Victoria and Albert Museum, London*. The cases were large spaces able to accommodate the lengthy veils of some of the wedding dresses. Fortunately, the space requirements for that exhibition allowed some fragile cloaks for the following *Kahu Ora* exhibition to be displayed flat on a 45-degree angle, such was the case with a

fragile large kaitaka over 2.5 metres wide to be displayed, for example, the Hadfield cloak on loan.

This exhibition was staged over a six-month period in a very engaging way, displaying kākahu with provenance and contemporary kākahu, and organizing public programmes. The publication describes many of those cloaks exhibited with interviews of contributing weavers and researchers (Tamarapa 2011). A unique component of this exhibition was the weaving hub, which hosted several weavers rostered to demonstrate the weaving of their works. Through this programme, both Māori and non-Māori visitors became informed about the plant materials, processing, and construction of kākahu. The weaving hub illuminated the craftsmanship of kākahu on display, showing how museums could be a portal connecting people to their taonga.

Over the last few decades, with accompanying changes in museum practice, Māori weaving has seen a resurgence. Te Roopu Raranga Whatu o Aotearoa continues to host a three-day biannual hui for enthusiastic weavers. Another platform that connects weavers through their craft is a Facebook site Raranga Toi Whenua currently with over 1000 members.<sup>14</sup> In my many conversations with weavers over recent years, most claimed they had become addicted to the practice, leading to a continuum of creativity and connectivity to their taha Māori, (Maori identity)

Material resources play an essential part in weaving. Weavers today often discuss questions relating to the health and maintenance of harakeke, kiekie and pīngao. Plants for dyeing such as raurēkau (giving a yellow colour), tānekaha (red/brown) and paru (black) are not so available. Alternative western commercial dyes such as Rit and Dylon are readily available and used more frequently by weavers these days. In recent years there have been new materials, and new ideas in weaving. So, it was at first contact, when Māori were intrigued by the new materials and objects Europeans brought with them. Trading and exchange were commonplace. However, over time the acquiring of new materials, while indicative of a persistence to innovate, arguably led to the detriment of their culture through the lack of gathering natural resources and greater disconnection with Te Taiao. The new materials

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<sup>14</sup> Raranga Toi Whenua Facebook site: <http://nzhistory.govt.nz/women-together/te-roopu-raranga-whatu-o-aotearoa> (accessed 1 March 2021).

used in the making of cloaks are far from the products of Te Taiao. On one occasion, I was called to examine a 'korowai' and was surprised to find only one element on the cloak was a natural resource. Otherwise, it was completely adorned with long iridescent green feathers that had been machine stitched onto a woven fabric and lined with a satin green fabric. On that occasion, I discussed the technical description of the cloak with the client and concluded that it was more appropriately called a 'kahu huruhuru'.

This chapter has given a brief overview of the changes in Māori taonga kākahu from the point of contact, along with changes in museums and in weaving practice. As it is with all humans, adaptation to new materials and technology is part of human development and innovation. An authentic and accurate representation of mātauranga Māori without European influence is imbued in traditional taonga kākahu. Only a handful of taonga of this period remain in Aotearoa, most of these precious heirlooms are in a deplorable condition, some exhibiting significant losses and notably a degraded black fibre with continual fragmentation. Below, I briefly survey the holdings of these cloaks in museum collections, and discuss related issues to do with condition, provenance, access, and outreach. In chapter four I closely analyze three outstanding examples.

In the Te Papa collection store is an example of a kākahu of this period that is weak although stable. It is a mahiti, a kākahu dotted with tufts of kurī fur attached to an all-black kaupapa-foundation, which featured in the *Kahu Ora* exhibition. In preparation for the exhibition the mahiti was attached flat to a support fabric that covered a wooden stretcher. It was displayed on a slight angle with controlled lighting not exceeding 50 lux. The decision was accepted by curators that the fragile mahiti would remain permanently on the support fabric stretcher, and be stored as such, to prevent any direct handling of the garment which could cause further damage.

Another all-black kākahu is a kaitaka (ME15529), with the undyed components being the woven weft, aho threads, and for most of it only the weft rows remain. This kākahu is not exhibitable as any movement will cause fragmentation of the black fibres. Another kaitaka similar in construction and from the same period is stored in the Auckland War Memorial Museum (52069), and it too cannot be exhibited because of its poor condition with disintegrating black fibres. The Auckland War Memorial Museum do have a reasonable remnant of a pukupuku, but it too is not exhibitable. At the Canterbury Museum there is an

impressive pukupuku currently on display. This type of kākahu has different-coloured wools incorporated in the tāniko border; however, a close examination may reveal whether the woollen yarns were woven in the original construction or later stitched over.

### **Poor provenance of cloaks in museum collections**

One of the roles of the curator is to provide, where possible, the provenance of an artefact or more correctly a taonga. The provenance supports the narrative in the educational mission of the museum. It is apparent that ninety-five per cent of the kākahu collection stored at Te Papa have no provenance at all. The Auckland War Memorial Museum has simple card records accompanying some of their kākahu. The records in most cases only note the donor and the location of acquisition. In a few cases the records have noted the person receiving the taonga and in even fewer cases the maker or weaver of the kākahu is noted. Also, at the Auckland War Memorial Museum there is a report by David Simmons, which lists Māori textiles kept in museum collection stores abroad and, in a few cases, the location of the acquisition is noted (Simmons 1996).

The conservator charged with the stabilization of the taonga is committed first to identifying the materials and construction of the artefact. The structure, composition, and condition will determine the best course of stabilization and hopefully provide information on the place of manufacture. In most cases the plant and/or fibre material is visually identified as harakeke or muka, however, the origin of the plant material is not. The weaving techniques provide no substantial evidence of provenance because the weaving technique is consistent, however the preparation of materials differs, and this is evident in the dyed material and the overall construction. Some of these features can be seen in the variation of hues in black and, to a certain degree, in the browns and yellows. Chapter four discusses the variation in blacks and browns.

There is also some variation in the preparation of the warp, whenu, which range from a tight ply, miro to a loose one or even none. For the tight miro I have observed that the whenu appeared pale or whiter in comparison to others, suggesting a more processed fibre, that is, from washing or rinsing of green matter after extraction of the fibre. The loose plying of whenu, and those without, have in general a slight honey-coloured hue. I have also observed that some of the traditional kākahu that are provenanced to Ngāi Tahu in Te

Waipounamu are woven without the ply of the whenu and in some cases incorporate a vertical contrasting group of whenu in the kaupapa. Further to this a narrow band of tāniko is woven in the vertical of the kaupapa, a description of one such example will follow.

Often the question is asked if the tāniko design is typical of a region. This is a difficult question to answer, particularly because so few of the kākahu have any provenance. Tāniko borders vary over a period, it seems to me, much like a fashion trend. The early kākahu, particularly pre-contact ones, generally have tāniko borders that are deep in comparison to the later ones and are woven predominantly with the black fibre with a subtle contrasting undyed fibre or directional change in weave to achieve a textured surface, such as the “black on black” work. Over time and with European settlement and adaptation to new materials, there was a change in the construction of kākahu. They became smaller and the tāniko borders became narrower and the overall design became more patterned, and they even changed position, from the hemline to the neckline as seen today on some modern cloaks. The change of position for the tāniko border is likely to have developed from early photographic studios or paintings, where the impressive tāniko border along the hemline was repositioned to the neckline to be captured in an image.

The changes in tāniko design and construction appear to be relative to a trend that develops over time and is influenced by cultural changes and development. One such case of associating a cloak to a people and or place is that of the author’s family kākahu collection that has several cloaks that feature Matariki, the morning star, in the tāniko border. Further to this the adaptation of the drawstring neckline, initiated by my grandmother and mother, has become a general feature seen in modern cloaks woven by several weavers throughout the country. This adaptation further supports weaving developments relative to a trend.

### **Access to cloaks back of house**

On occasion, by appointment, museums open their doors to members of the public, from individual researchers, students, whānau, and iwi, giving them access to the collection stores. The ‘back of house’ programme developed at Te Papa is much appreciated by attendees. This programme is an aspect of the bicultural policy developed at Te Papa in the last two decades of the twentieth century. Meanwhile, front of house on the marae there are



numerous events: lectures, performances, repatriation ceremonies and on a few occasions tangihanga. On occasion kākahu are selected from the collection store and used to drape the crates of returning toi moko, kōiwi and tupāpāku in the style of a tangihanga.

The selection of cloaks is done by the acting iwi kaumatua whose role is to advocate tikanga. The cloaks chosen are mainly traditional cloaks without provenance, chosen because they represent the old time, Te Ao Kōhatu. Collection managers take charge of removing the cloaks from storage and handling them during the ceremony, then returning them to the store. This practice has been of concern to me as a conservator within the institution. Traditional cloaks used for these occasions are subjected to handling by both museum staff and those who are not professionally trained. The use of gloves during this handling is not adhered to as this interferes with Māori protocol. The gloves appear to be foreign in the physical act of emotional embrace with ancestral treasures. Obviously for me as a professional conservator this is a dilemma, as this practice while culturally defensible, may have led to the damage of collection items.

### **Outreach programmes: National Services Te Paerangi**

Te Papa has, in accordance with the Treaty, an obligation to care for taonga outside of the museum.<sup>15</sup> One such department takes charge of working with communities: National Services Te Paerangi (NSTP).<sup>16</sup> I am part of a team that travels around the country to present best practices for the care of Māori textiles. A presentation on conservation informs audiences of the museum practices that preserve the physicality and mātauranga of the taonga. Archival materials are made available, and a workshop demonstrates the construction of storage support and enclosers. Further to this is an explanation of the taonga's condition and how best to handle and store it.

On many occasions it has become apparent that community members are not knowledgeable about the materials and construction of their taonga. However, the

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<sup>15</sup> See: *Te Papa Our History*: <https://www.tepapa.govt.nz/about/what-we-do/our-history> (accessed 1 April 2021).

<sup>16</sup> See: *National Services Te Paerangi*, Te Papa website: <https://www.tepapa.govt.nz/learn-for-museums-and-galleries/national-services-te-paerangi> (accessed 1 May 2021). See also Māori weaving collections at Te Papa: “Te Whare Pora,” <https://www.tepapa.govt.nz/discover-collections/read-watch-play/maori/maori-weaving> (accessed 1 May 2021).

whakapapa of the taonga is always known and for this the learning of its material construct is enlightening for the kaitiaki (guardian). This engagement on common ground connects taonga and tangata whenua, and good feedback received in evaluation forms completed at the end of hui by attendees is testament of this.

Furthermore, the outreach programme offers Expert Knowledge Exchange (EKE) consultations with members or groups of the community who care for collection taonga. One such case was a follow-through after a Marae Taonga Kākahu workshop. This consultation was to advise on the construction of an onsite storage room. The workshop held on the marae opens conversation about the locality, its surroundings, histories, and whakapapa. The positivity generated from the workshop and EKE, as described by Paora Tibble in a letter, is an indication that connecting taonga with tangata whenua matters (Appendix III). The physical condition is conserved, the mātauranga realized, and the kaitiaki's identity is restored. This positive marae-based workshop experience has underpinned this research and reinforced the argument that museums need to act as portals through which taonga can be cared for but also reconnected to people through conservation and curatorial practice.

### **Weaving practitioner's research**

Today, in my view, weavers are distanced from the weaving techniques and material processing of pre-contact taonga kākahu. The Māori practice of preservation is, in the main, to retain the knowledge and continue the craft that produces the taonga. Such an exercise was carried out by a small group of weavers who travelled to London to examine Te Rā the historical sail held at the British Museum. In this self-funded research project, the objective of the weavers was to recreate the sail. They would connect to the mātauranga and the technical execution of our tūpuna executed centuries ago. Another connection was expressed by a young male weaver who is in the process of reweaving his tūpuna kaitaka, that is held in the Te Papa cloak store. This is an admirable journey (Tamarapa 2011). The weaver has described the journey as “walking in the footsteps of his tūpuna”. These weavers are rekindling the mātauranga of Te Ao Māori. Several weavers have completed doctoral studies in the mātauranga of weaving and some, like myself and my sister, are in the process of completing doctoral studies in the mātauranga Māori of weaving. Weavers

who pursue the sourcing of their harakeke, waiwai and repo—wetland water, muka, tannins and iron-rich mud, respectively, with the objective of recreating taonga kākahu, are reinstating mātauranga Māori and reconnecting to whānau whakapapa.

Mātauranga is an especially important element of the weaver's research into the making of kākahu. The epistemology of Te Ao Māori is about the supporting framework of identity. Learning about and engaging with Te Ao Māori recognizes and respects the different realms of existence. From a cultural perspective knowing one's existence through whakapapa is a life experience where one can be guided by values and beliefs. I would argue that the mātauranga held in taonga kākahu pre-contact provide tangible evidence of what it represents. In the black threads woven in the deep borders of the early kākahu only the directional aho threads give a textured and slight pattern to the overall black. The observations of our seafaring ancestors of the ocean's waves and currents may influence such patterns woven into the deep border. The significance of those waves and currents would be fundamental to the navigational skills of ocean-faring through night and day. The black threads represent the ocean activity during the night, when observations of both sea and star positions determined the course (Thompson 2019).

Whakapapa is another crucial element of taonga kākahu, as it is for whakairo, tukutuku, and other visual and material practices (McCarthy 2019). Whakapapa or relatedness grounds a person in their cultural identity which is the most important aspect of anyone's existence. Knowing your whakapapa is a fundamental law in Te Ao Māori. The metaphysics of connecting your existence to mātauranga are made possible through the preservation of whakapapa. In the world of nature, Te Taiao, we recognize the whakapapa connecting to the separation of Ranginui and Papatūānuka. This separation begat the atua of the forest Tāne Māhuta with his off-spring Tānekaha and Rehia, with their offspring harakeke. So, the materials of pre-contact taonga inherit the whakapapa of Te Taiao. The sourcing of natural materials for weaving a cloak, such as fibre of harakeke muka/whitau, treated with waiwai—solutions of tannins drawn from the barks of tānekaha, hīnau, mānuka, tutu to name a few and in the case of dyeing black the treatment of iron-rich mud from the repo, is a practice of connecting to Te Ao Māori and Te Taiao.

Māori have had their own approach to conserving their taonga kākahu. It is recorded that Māori post-treated the black fibre after the first dye bath, with a soak in the waiwai or tannin solution (Tregear 1904). I have met with a group of weavers who were charged with the task of producing enough piupiu for a concert party and practise the post-treatment of soaking in the waiwai solution. The chemical reactions of this post-treatment suggest that the second and final treatment with a tannin solution can neutralize or provide a buffer of acidic products. There are few examples of traditional piupiu that have minor black fragmentation, accordingly, the post tannin treatment could be attributed to this. As a conservator, I adhere to the practice and measures taken to care for and keep taonga stable and determine the best course of preventing damage. Being a weaver, I am interested to learn the material processes and the construction of the taonga and furthermore, being of Māori descent, the mātauranga and narratives of the taonga. I am arguing in this thesis that these aspects of caring and knowledge gathering can be supported by the museum with a positive outcome for museology and those it serves (Sully 2007, Bloomfield 2013, 138).

## **Conclusion**

This chapter has shown the detrimental effect that colonization has had on Māori cultural heritage through museums but also the positive changes in recent years in museum practice and weaving. Loss of land, culture and identity over the centuries has amounted to the poor state of health and well-being for Māori. But the mātauranga Māori in taonga kākahu held in museums can reveal what culture and identity Māori had. In this chapter I have explained my own unusual background as a weaver and textile conservator who has had to reconcile the worlds of science and indigenous knowledge. My training and family upbringing equip me to examine and reveal the tangible and intangible values of taonga kākahu and reconnect them to where they came from, the objective of this thesis. In a later chapter the study analyzes and describes the philosophy behind patterns and technical forms of woven treasures. In doing so, it makes the knowledge transferrable as a means of reconnecting to mātauranga. However, in the next chapter I consider the lessons of conservation and heritage materials science and how they can aid in the urgent task of preserving Māori textiles for future generations. I also consider the western scientific techniques of museum conservation, and what they can contribute to the tasks of preserving taonga tuku iho.



## **Chapter two:**

### **Conservation of Māori textiles**

#### **Introduction**

In the last chapter I presented the mana of kākahu and their significance for tangata whenua. I highlighted those cases where the significance of kākahu for our people today is fundamental in connecting to Te Ao Māori, as a material object through which those intangible values are recognized. In this chapter I address the tangible value of kākahu and, from the perspective of the museum role of textile conservator, analyze and discuss the conservation of Māori textiles. First, I look at the problems and possibilities of museum conservation practice in terms of how it can help or hinder the care and preservation of weaving, especially considering the points I raised in the last chapter. I highlighted the vital connections to a living cultural practice, to Te Ao Māori and Te Taiao, which are important for the restoration of cultural identity today. I then examine the history of conservation and Māori engagement with it in terms of collecting and displaying textiles including my own career as a professional museum textile conservator. I summarize the lessons from heritage materials science about iron tannate dyes which pose problems for the care of taonga kākahu.

The next section of the chapter presents my previous research into consolidation of dyed black fibre. This enables me to build upon this research in the chapters following, which presents my investigations and compares them to approaches of conservation carried out in other conservation laboratories. The last section explores the limits of conservation science research on taonga, arguing that we need to consider other approaches to caring for these precious and fragile taonga in museums in ways that reflect a Māori world view and allow people to reconnect with their heritage. Often the practice of conservation comes into conflict with the curatorial role in negotiating the selection of taonga for display or exhibition. Often access to the taonga or the chance for it to reconnect with uri (offspring/descendant) are compromised by the condition of the cloak, in most cases the fragile condition which often will mean the withdrawal of the taonga from display.

## **Decolonizing conservation: Problems and possibilities?**

As Māori I know my whakapapa and other whakapapa, and the associated names of tūpuna, of stars, of forces, of landmarks, events, creatures of all elements, which in my tribal region provide a framework of relations with people, things and the environment and with the past, present and future. The exploration of the Pacific by our seafaring tūpuna, who traversed the largest ocean on the planet, is considered one of the greatest feats of humankind. Yet, Māori have been subject to 250 years of colonization, having to comply with and aspire to a culture foreign to their philosophical view of life. This is a complex reality for Māori. The objective of reconnecting taonga kākahu to their descendants, as a principal aim of this study, is in some cases limited by museum conservation principles. The physical condition of the taonga determines whether display and or movement is possible, particularly if it possesses the traditionally dyed black fibre. It is certainly the mission of the museum to care for objects and prevent deterioration by researching the best means of doing so, however this practice should not prevent the connection between taonga and their respective people. Too many of the early Māori textiles are not displayed because of their poor condition and yet they still hold a wealth of knowledge that is transferrable. The museum can be instrumental in connecting taonga and tangata whenua. This chapter outlines the condition of some of our most vulnerable Māori textiles and the developments in conservation that have been made for their stability. Considerations towards exposing some of those textiles that have never been showcased because of their poor condition, will also be discussed.

Realizing the fragility and perishing state of the dyed black fibre found in tūpuna kākahu, and the consequent distancing of them from their descendants, requires an urgent response from the custodian to stabilize and preserve their tangible and intangible values. Research that addresses a means of stabilizing the black fibres has, to date, not been able to confidently recommend a means of conserving the kākahu. Conservation research is an analytical practice that requires sophisticated tools to identify chemical reactions between the object's material and the introduced chemical—in this case to treat the black fibres. Halting or retarding deterioration by means of chemical intervention, is an irreversible treatment however this is the only option presently afforded to the fragile fibres. A novel consolidation treatment with the application of sodium alginate has been effective in



retaining the fragile fibre within the body of the taonga, however an alteration to the black colour compromises the aesthetic value. It is arguable that without the novel consolidation treatment the fibres could likely be lost.

In the time that it will take for the practice of conservation to confidently recommend a consolidation treatment, losses can be expected. It is timely, therefore, that a cultural perspective of preserving the mātauranga and understanding the material makeup and construction of the taonga is realized.

Traditional weaving did succumb to a relatively strong and rapid European influence during colonization. The interactions of working with material resources diminished also with the clearing of land for agricultural developments. During this period, Europeans recognized the significance of harakeke to Māori and its potential for the development of a new textile industry and for this purpose they recorded the many varieties used. Regrettably today Māori are not versed in the varieties typical of their locations. Traditional practices gradually phased out and adaption to European culture took precedence. Māori textiles of this period changed in construction and the introduction of European materials is evident in those textiles held in our museum stores.

### **The development of museum conservation in Aotearoa**

Conservation is a practice of applied science where the material stability of objects and their make-up are observed at a molecular level. As Caple explains, “it is the efforts to preserve, balanced with the needs to reveal and investigate the object and its values which can be understood as conservation” (Caple 2000, 33–35). Modern building and museum conservation developed in Europe in the mid- to late nineteenth century (Caple 2012, 12–15). By the late twentieth century, conservators began to acknowledge different cultural perspectives on the preservation of objects. “Preventive conservation has also looked back to ‘traditional’ practices, in a range of cultures”, Caple points out, as “traditional methods often have the benefit of being low energy solutions, using natural materials and sympathetic to other aspects of human existence” (Caple 2012, 9). So, from the 1990s there have been new approaches to preventive conservation and collection care in museums.

There was increased concern over the rights of indigenous peoples and their material culture. This was signalled through the passing of legislation such as the Native Graves Protection and Repatriation Act in 1994 in the USA, the frequently revised Burra 18 Charter (1979–1999) in Australia and the Nara Conference on authenticity in 1994. These events signified an increasing awareness of other cultures and that other ‘non-traditional’ ways of looking at artefacts had validity. This was also expressed in an increased appreciation of the importance of context in understanding artefacts. Consequently, we have seen far greater efforts being made to preserve archaeological and historic sites ‘in situ’ in recent years (Caple 2012, 17–18).

Sully addresses three approaches to conservation practice; material-based, values-based, and peoples-based (Sully 2015, 300). Peoples-based conservation equates to minimal intervention. Whenever possible the minimum intervention required to realize the aspirations of communities connected to the object should be undertaken. This should be led by the community in ways that are appropriate to local customs and practice. A shift toward a peoples-based approach utilizes participatory processes to enhance the connection between a community and their heritage in ways that are appropriate to those people, seeking to empower communities to make their own decisions about the care of their heritage (Sully 2015, 307). The work of Sully is emphasized here because he advocates for connection between communities and material heritage. The very goal of this research is to preserve the mātauranga of taonga kākahu with the people and for the people. The actual conservation practices currently in place are not compromised in this proposed development of connectivity but rather have the potential to add to the material value base. Knowledge of the material is required for the stabilization treatment of the object and people who have knowledge of the procurement and processes who can support that object knowledge base.

In the instance of taonga kākahu, where the principal material is *Phormium*, the chemistry observes the behaviour of the cellulose molecules in their responses to moisture, light, and heat (Timar-Balazsy, Eastop, 1998). Predicted reactions based on the properties of a material, set the research context in which to direct the best care. This directive is the principal practice of conserving museum collection items, ideally to last for eternity so that the museum can showcase a material culture.

The collection and care of objects in museums were tied up with the rise of imperial expansion in early modern Europe reaching its peak with colonization in the nineteenth century (Bennett 1995). In the British settler colony of New Zealand museums sprang up which were modelled on institutions in England and around the British Empire (McCarthy 2012). The first museum was founded in Nelson in the upper South Island in 1841 (McCarthy 2016). Later the establishment of major metropolitan museums followed with the Auckland Museum, the Colonial Museum in Wellington, Canterbury Museum in Christchurch, and Otago Museum in Dunedin, all established between 1850 and 1865 (McCarthy 2011, 29–30, McCarthy 2016). For the most part, they housed geology and natural history objects, with an interest in anthropology and ethnology developing toward the end of the century.

As pointed out in the last chapter, the Māori collections at the Colonial and later Dominion (now Te Papa) museums are the largest in the country, including the biggest collection of approximately 360 kākahu.<sup>17</sup> By the 1980s concerns mounted regarding how taonga Māori were stored with the kākahu collection, that is, folded and compacted into brown acidic boxes. Storage systems were upgraded in the mid-1980s and the kākahu were stored individually and flat in wooden drawers and have remained so since. While placing the kākahu into new storage and cataloguing the collection, a conservation assessment number was assigned for each, where ‘5’ indicated poor condition and ‘1’ recorded that the kākahu was stable. It became apparent that many were in poor condition because of the dyed black fibre perishing, which was not helped by the poor storage condition prior to flat storage in drawers. The National Museum had established a conservation laboratory by the mid-1970s, founded by Jack Fry, and with the poor condition of many of the kākahu collection, for the conservation department there was a degree of urgency to stabilize them by the conservation department.

The practice of preserving artefacts in museums in New Zealand was introduced relatively late compared to institutions in the northern hemisphere. In the early 1970s local museums embarked on the conservation and preservation of taonga and the National Museum established a conservation laboratory staffed with a head of department, paintings, paper

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<sup>17</sup> See: “Styles of Māori cloak: Collections Online,” Te Papa website: <https://collections.tepapa.govt.nz/topic/3614> (accessed 15 May 2021).

and textile conservators, exhibition preparators/framers and receptionists/typists for reports. Investigations into a means of stabilizing the fragile black fibres began in the early 1970s when the Cultural Conservation Advisory Council within the Department of Internal Affairs supported an exploration of means of stabilizing the fragile black fibres. The council initiated a research programme at Otago University headed by Dr Peter Barber in 1972. For this research, weavers from the then Moananui a Kiwa Weavers, directed by the late Emily Shuster, contributed samples of dyed black muka. Albeit the results of this work gave no clear directions in stabilizing the black fibres the work did describe the anatomy of the *Phormium* genus and some analysis of the dyed black fibre, some fundamental information for further research.

The serious condition of the fragile iron-tannate black fibres in Māori textiles attracted the attention of several custodians both nationally and internationally. Investigations carried out at the Auckland War Memorial Museum in late 1980 examined the deacidification of the acidic black fibres with an ultrasonic bath, however no report of this treatment was made available (Barton 1986). Further to this work, conservators trialled the application of cellulose nitrate adhesive to consolidate the iron tannate black threads. The research, however, did not provide any direction in stabilizing by means of consolidation.

The Dundee Museum in Scotland has in its collection a korowai adorned with black hukahuka. The cloak was structurally sound overall, with no losses of the thrums, however fragmentation was evident. Fragmentation of the black thrums initiated a conservation treatment with the application of a consolidate to arrest the deterioration. A de-acidifying and binding agent, pHizz-methoxy magnesium methyl carbonate and Klucel G respectively, was brushed on to each black thrum (Scott 1986, 22–24). Upon examination of the korowai several years after treatment, I observed that the black thrums appeared stable with no obvious signs of fragmentation. The treatment was developed to buffer the acidic nature of the iron-tannate and bind the fibres together.

A piupiu became the research focus for a British conservation scientist Dr Vincent Daniels at the British Museum (Daniels 1999, 73–85). A research relationship was developed with colour specialist Professor Gerald Smith formerly of Industrial Research and now Victoria University of Wellington, New Zealand. It was from this relationship that I, then employed

by the National Museum, was contacted by Smith, and encouraged to be involved in the research. Daniels was keen to learn the make-up of the piupiu and travelled to New Zealand to witness the procedure for dyeing the fibres black. In the company of my mother a demonstration was held of extracting the muka, procuring the tannin solution from the bark of the hīnau tree, in which the muka would soak overnight, then air drying and treating with the iron-rich paru. The threads remain submerged in the mud overnight, and when removed on an ideal sunny day, were teased apart, and exposed to the sun. This practice adhered to by my mother was supported in theory by Daniels who explained that the warmth of the day's sun exposure activated the complexing or fixing of the iron and tannate reagents.

When Daniels returned to the conservation laboratory of the British Museum, he continued his research into the degradation and the possible stabilization. His research focused on the effect of introducing an aqueous solution as a medium to carry the consolidate into the fibres. The absorption of moisture causes the plant fibres to swell and, upon evaporation, contract, and this reaction leads to embrittlement. The objective of finding a stabilization treatment for the Museum of New Zealand remained a pressing issue.

### **Māori in museums (and conservation)**

During the time that scientists were investigating the stabilization of the dyed black fibre, there was a call for those of Māori descent to be part of the caretaking of taonga, a move prompted by the *Te Māori* exhibition. As shown in the last chapter, this exhibition was instrumental in a change in the way museums recognized the cultural significance of tangible and intangible values in taonga Māori and the connections to their taonga. In response, the National Museum set out to honour its Treaty of Waitangi obligations and develop a mandate for bi-cultural management within the western construct of the museum. Biculturalism would showcase a Māori presence that had become an integral part of the decision-making for collections, exhibitions, and programmes (McCarthy 2018). Māori were also trained in conservation. I am one of five Māori who studied at the Conservation of Cultural Materials department, University of Canberra, supported by the Department of Internal Affairs.

My career in conservation began in 1986, after being encouraged by my mother and grandmother to accept the invitation to seek the knowledge of preserving textile artefacts in

a three-week introductory course in the conservation of cultural materials at the then Canberra College of Advanced Education, which in 1988 became the University of Canberra, Australia. The course introduced me to the concepts and principles of conservation and outlined what study was required to secure a position as a conservator, which was a three-year Bachelor of Science degree in materials science. I did this introductory course alongside lifetime colleague and friend Valerie Carson, the textile specialist at the Dominion and later National Museum.

A prerequisite matriculation level in chemistry was required to begin the science degree, which I achieved in 1987 attending Wellington High School. During this time, I trained under the supervision of Valerie Carson at the National Museum conservation department, to develop the manual skills in stitch work and such, which my weaving and sewing skills supported. I began my official study in Canberra in 1988 and gained the science degree in cultural materials in 1990. I returned to the museum conservation laboratory in Wellington for a year's training before doing a six-month internship in the United Kingdom, first at the Textile Conservation Centre, Hampton Court Palace, then at the British Museum conservation laboratory, Osmond Road, London. This time in the United Kingdom introduced me to the historical collections of European textiles and the applied sciences, which were employed for their stabilization.

The training overall was intense and scientifically challenging at times, however the craftsmanship and knowledge of material culture would capture my interest and respect and set me up for a lifetime career in conserving textile artefacts. The conservation of artefacts is a practice of ongoing research that constantly investigates materials of varied composition, construction, condition, and intellectual property. Ultimately the conservator's role is to stabilize the artefact so that its cultural information is a means of educating the museum visitor or those intimately associated with it. As well as this training and early career work, I was also affiliated to the conservators' group The New Zealand Conservators of Cultural Materials (NZCCM), which includes conservators of different disciplines and aspiring conservators. The group has a code of ethics to abide by, ensuring the preservation of the country's material culture, which is outlined on their website (Appendix II).

While training in western materials science, I remember when I first had to explain to my mother the concept of 'conservation'. I said that conservators were charged with the care

and longevity of artefacts making them stable to remain with us forever. My mother replied that no one thing is supposed to last forever according to Māori custom, that everything has a beginning and an end. She continued to say that if you were to retain the practice or craft of weaving a kākahu then you would preserve the knowledge or mātauranga. This practice also applies to the retention of whakapapa, ultimately one's identity.

So, it was my mother and her dear companion, the well-known weaver Emily Shuster, who travelled abroad to the United Kingdom and United States, funded by the Department of Internal Affairs in 1985, to look with weavers' eyes at the collections of historical Māori textiles held in museums. They reported that what they saw there was indeed special, intricately woven taonga and that they felt very privileged and proud to be in contact with them. They also expressed how grateful they were for those that cared for the kākahu, and their time taken to host them. It would seem at the time that my mother and other weaving friends, being part of the resurgence of traditional Māori weaving, developed an appreciation for the museums' role in caring for the taonga kākahu and storing them in their buildings, and that they could often visit and refer to the mātauranga imbued in them

Conservation science influenced the way in which kākahu were displayed in museums. For the leading New Zealand museums kākahu were exhibited within a narrative of the overall story of Māori culture. The kākahu that featured were mainly of the mid-nineteenth century with few dating earlier, as seen in the *Mana Whenua* kākahu exhibit space in Te Papa for opening day in 1998, which comprised the best of its collection, such as a kahukurī, kaitaka, and kaitaka paepaeroa. After a period when staff adhered to the rule of changing out the kākahu every six months (as required by conservation standards), the selection of kākahu became strained. The limitation in selection was in part due to the condition of the kākahu and the space required to display them, that is to be laid flat at no more than a 45-degree angle. Other Māori textiles would take their place in the *Mana Whenua* cloak case; these included piupiu, kete, tatua (belt) and whāriki. Eventually, contemporary works, from the frequent iwi exhibitions, were displayed including both historical and contemporary taonga kākahu of the respective iwi, and in most cases the contemporary textiles were in reasonably sound condition.

Te Papa's *Kahu Ora Living cloaks* in 2012 was a unique kākahu exhibition which featured a selection of both traditional and contemporary Māori textiles, with an emphasis on connecting people and families to kākahu. As mentioned in the previous chapter, fortunately the cases previously used in another exhibition in the same space enabled us to exhibit some fragile cloaks for the following *Kahu Ora* exhibition, which were then displayed flat on a 45-degree angle, including a fragile and exceptionally large kaitaka over 2.5 metres wide and 1.2 metres high.

It is apparent that some inherent properties of the material composition of feather cloaks, such as the aging *Phormium* fibre both undyed and, particularly, the dyed black, place limitations on displaying kākahu. There has been little understanding of how to stabilize the poor condition of kākahu with dyed black fibres and indeed the stabilization of any iron-tannate treated substrate is most challenging for the custodian. Various means for treating a variety of iron-tannate dyed plant fibres have been developed, however recommendation of a proven means of stabilization has not so far been achieved. This poor condition limits access and display and can prevent handling and ultimately, in this case, the opportunity to reveal the cultural integrity of taonga kākahu.

### **Heritage materials science and kākahu: black dyed fibre**

The application of an iron-rich source to colour a substrate black was used extensively in early civilizations. Black can represent the wearer's status or condition. The Bruneta black seen in Mediterranean dress was described as a pure black and those wearing it were prosperous (Cardon 1997). More commonly black represented those in mourning. In Ancient Egypt of the Bronze Age, an iron-tannate was produced for use as ink, and early Chinese civilization developed this for the same purpose. Variations of an iron-tannate treatment are evident also in other cultures. Traditionally in Scotland, black dyes were procured with the tannin sourced from bark or walnut then placed in a black bog or marshy wetland (O'Connor 1992). Mali in West Africa, Peru, the Pacific Islands and Māori all share a common practice of pre-treating the fibre with a tannin before applying an iron source. The colour black can dominate or highlight other colours as a contrast and in modern times has its own repertoire.



A key theme explored in this research is the colour black in Māori textiles. Most Māori textiles dating from the mid-nineteenth century have traditionally dyed black fibres. The rare few potae (hats), or perhaps we should say ‘caps’, are woven with black elements, representing a mourning headdress. A few examples of traditional cloaks woven all with black whenu, are housed at Te Papa however there is no reference to them being worn in bereavement. A kaitaka with only black whenu and aho and adorned sparingly with tufts of awe (dog fur), dates to approximately the eighteenth century and is likely to be the oldest cloak in the collection. The kahutoi, woven with toi, is an overall black cloak. The toi makes for a strong foundation impenetrable to wooden spears. Appropriately this cloak is referred to as ‘the warrior’s cape’, useful particularly at night as the black cloak provides camouflage.

The korowai of traditional times is heavily adorned with black thrums either worked as hukahuka and/or kārure over the main body, or kaupapa, and the borders. The meaning of the freely moving thrums is in relation to the movement of water; korokoro (loose), wai (water), and it is constructed in such a way that the wearer’s movement causes movement of the thrums in unison. The pre-contact taonga kākahu; kaitaka, kaitaka paepaeroa and pukupuku were common for this period and typically feature tāniko borders contrasting with the undyed muka woven in the kaupapa foundation or main body. The tāniko borders of early kākahu are predominantly black and can be identified as kiwa<sup>18</sup> (deep black) of the sea. The weaving of black elements is intricate in tāniko work, the elements are woven compactly and have directional changes to produce a pattern and or textured surface.

There are some special kākahu in the Te Papa collection store that have never been displayed because of their poor condition. Three examples are given here of the kind of ancient garments which could be displayed if we were able to. The most fragile in this collection is the kaitaka, from the Oldman collection, that dates from approximately 1830. The cloak features black warp-whenu and contrasting weft threads of undyed muka. The kaitaka is large in comparison to other kākahu in store, notably wider than it is deeper. Approximately fifty per cent of the kaupapa of the cloak is lost and the undyed weft threads remain loose from the main structure. The kaitaka was first examined by me in 1999. The

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<sup>18</sup> Che Wilson, personal communication with the author, 2021.

fragile condition was obvious, and many black fibres were lost. At this time, no stabilization treatment was available, and the cloak was examined for a research project investigating a means of stabilization. The cloak was carefully laid on a washed cotton support and the tangled loose aho rows were aligned. The cloak was then rolled in between layers of cotton and polyester wadding, providing a cushioning and protective form. The cloak was clearly labelled “FRAGILE! Please do not examine without Conservator”. The kaitaka has not been seen since this examination (Figure 12).



Figure 12. Dr Gerald Smith and I examining a fragile kaitaka with loss of black fibres.

It is very moving witnessing the reaction of Māori visitors to the storeroom, when first seeing taonga such as the rāpaki (ME002086) for the first time (Figure 38). Measuring 1200 mm wide and 630 mm high, the waist garment features hundreds of fine dressed-leaf lengths hanging from a woven foundation. Each cylindrical length has a fine diameter of approximately 2 mm, and each has numerous sections where the leaf surface has been scraped to break the waxen surface and to expose the fibres to allow the iron-tannate dye to penetrate. The lengths are woven into a foundation by a black fibrous end, along several weft rows and a thick plaited waist band. Collectively, the lengths present an effective shimmer appearance uniquely different to the uniform pattern commonly seen of the waist garments. The rāpaki has numerous losses which are retained in a large sample bag. The overall appearance, however, is not compromised because the lengths are multiple and spread across its width.

The korowai was considered common dress and no reference is made to it being worn by rangatira, those of rank or mana. It is readily recognized by the black hukahuka and/or kārure—ringlet-type black thrums placed over the foundation. This korowai has a combination of both hukahuka, kārure and short lengths of pōkinikini uniformly placed over the foundation and more closely placed down the side, upper and lower borders. Fragmentation of black fibres, as a dust, was obvious on the pale foundation, this distracts from the overall aesthetic value, as do the tangled and disarranged thrums. Although the fragmentation of the black elements is obvious, the overall structure is intact. This condition may suggest that the cloak has not sustained notable damage as a functional item but, rather, because of the entanglement of the black thrums.

Typical of traditional cloaks, the korowai is large, measuring approximately 1500 mm wide and 1200 mm long. The weaving techniques employed are finely worked both in the many weft rows and particularly in the plied thrums—a measured ten ‘Z’ twists per centimetre. Should the opportunity arise to display the korowai, the conservation treatment of surface cleaning and an alignment of threads would markedly improve its appearance.

The kaitaka huaki is traditional Māori weaving at its finest. This cloak reveals an impeccable weaving skill without adornment, no thrums, or feathers. The kaupapa of the cloak is plain and supports the theory that less is more. The weaver executes an even tension throughout, an eye for precision and mathematical feats without calculator or graph paper. The weft rows have a weave count of approximately ten whatu stitches per centimetre and a spacing between rows of approximately 5 mm. Each stitch is visible and to the untrained eye appears as machine stitching, a quality once remarked on by a visitor to the conservation laboratory. Almost incomprehensible is the weaving technique and skills in the tāniko borders—not one but two. With the aid of a calculator, I estimate that there are more stitches and skill woven in the tāniko border than in the kaupapa, because of the absence of spacing with the weft rows and the carrying of contrasting weft threads that weave a pattern. The kaitaka huaki is in poor condition. It has sustained some water damage which has resulted in obvious water marks. The water damage would also exacerbate the deterioration rate of the muka fibres particularly those dyed black. The soluble black dye is also detected in the edges of the water mark. A collapse of the tāniko weaving resulting from the loss of black and loose whenu has compromised the integrity both structurally and

aesthetically. Technically, the cloak speaks volumes, however its condition restricts its exhibitable time. On occasion the cloak is seen during visitor tours through the collection store.

The whāriki woven with harakeke or kiekie leaf strips, both natural and dyed black, have almost disappeared from marae furnishings. Traditionally, the whāriki would completely cover the wharenuī (sleeping house) floor which would be compacted earth. The contrasting black elements were woven to form patterns, worked in sinistral and dextral weave, described as raranga. The whāriki would have been an attractive floor covering, it would, though, be prone to damage in heavy traffic. The general condition for whāriki is the loss of black elements with fraying and entanglement.

### **Research into consolidation of dyed black fibre in weaving**

How can materials science help museums preserve textiles, so they are able to show them to the public? In the event of lost elements in an artefact, adding a support material can prevent further loss by providing strength to the surrounding area of loss. The attachment of a support material was either by stitch or an adhesive. Some early attempts to support an area of lost black fibres in Māori textiles, have used the application of Japanese tissue, adhered in place with Carboxymethyl-cellulose. After several years, however, the Japanese tissue failed and did not remain in place as support. Another means of supporting an area of lost black fibres in a tāniko border, was the application of Violene—a polyester interfacing fabric also adhered in place with Carboxymethylcellulose CMC and in-painted to match the surrounding tāniko pattern. This method of support was effective however, it made the area supported rigid and its induced strength possibly opposed the more subtle woven surround that was not supported. In my role as a conservator, stabilizing an area of lost black fibres in the tāniko border of a kaitaka, I have stitched a dyed cotton organza to the reverse to support the area of loss, and provided a protective Stabiltex gauze to the obverse. The attaching of the support and protective fabrics sandwiched the vulnerable area of loss. This also allowed the re-alignment of loose warp threads that became disarranged because of the lost black elements. The body of the cotton organza provided a firm support whilst not completely covering, like a patch, the area being supported, therefore still making partially

visible the woven work. This applied also to the more transparent Stabiltex gauze on the obverse.

A similar treatment for a whāriki, featuring decorative, contrasting, dyed black leaf elements that were partly lost, supported the mat with a dyed cotton twill fabric. The attachment of the support fabric was worked in couch stitches, again the very tangled and frayed elements were aligned, and the treatment prevented further loss and partly restored the mat's aesthetic value. (Figures 13 and 14) In both treatments the loss of black elements was an accepted condition and there was no intention of restoring or replacing them.



Figure 13. Whāriki before treatment, reverse.



Figure 14. Whāriki after treatment.

The treatment to support areas of lost black elements in some cases has been effective. The fabric supports remain in place and reduce the likelihood of further damage to the area surrounding the loss. The support work in all cases is reversible, including the addition of the Violene that was adhered in place. Reversibility of a treatment is a criterion to meet where possible in case future science and/or technology should find a more compatible treatment.

The support work described above provides some stabilization for cloaks, however fragmentation of the black fibres would still occur in the event of handling or movement. After some years of searching or experimenting with conservation materials to support the areas of lost iron-tannate black fibres in Māori textiles, the decision was made to seek some

chemical intervention by means of consolidation for the very fragile fibres which would aim to provide strength and bind the fibres together without altering the black colour.

### **Developing a consolidate**

The challenge for the conservator when stabilizing an artefact is to retard deterioration and retain the physical integrity with minimum intervention, whilst aiming to keep the treatment reversible. In most cases, if the stabilization work is physical support, then reversibility is achievable. However, if a chemical intervention is required, reversibility is not possible. The weak and fragile condition of the black fibres limits the conservation treatment to consolidation, to bind fibres together and induce strength. This treatment is irreversible.

Investigations engage the experience of chemists and university academics in scientific studies to engineer a consolidation treatment for the perishing iron-tannate black *Phormium* fibres. I presented fibre samples—natural undyed, tannin and mud treated—for this research work which was part of my master's thesis at Victoria University of Wellington (Te Kanawa 2005).

In any endeavour to find a stabilization treatment the materials and processes need to be fully understood. I treated *Phormium* fibres with two types of tannins and one source of mud for the research to demonstrate the differences in two types of tannins that are commonly used by weavers today and the dyeing of black fibres. Analysis of the tannin solutions by absorption spectra identified the tannins from hīnau and mānuka, as a gallotannin and condensed tannin, respectively. These two tannins produce a slight difference in hues of black, the hīnau gives a slightly blue black and the condensed tannin a slightly green, black. Variations in blackness are further discussed in chapter four. Only one source of mud rich in iron, was used for experiments. The fibre was soaked overnight in the tannin solution before being left to dry at room temperature then it was submerged in the mud and again left overnight. The following day, a clear day, the fibres were removed from the mud, teased apart, and exposed to sunlight and left for half an hour. The fibres were then rinsed in water to remove the mud and any particulate matter.

In terms of mechanisms of deterioration, *Phormium* fibres have an inherent vice, compared with other cellulosic material such as linen and cotton. As flax has a high content of

hemicellulose (Smith 2003, Te Kanawa 2005). The hydroxyl groups attached to this molecule are very reactive to light and moisture and undertake a series of reactions that break molecular bonds and cause embrittlement and loss of strength, seen as a discolouration of the fibre, like aged brown paper. The mechanism of deterioration increases when the fibre is treated with tannin then an acidic and reactive source of iron. Once the dyed black fibres are exposed to air, they begin a slow accumulative process of deterioration. In the presence of moisture and heat, the degradation increases.

The procurement of black varies between each culture; however, the complexing of a ferrous and tannin substance generally has the same chemistry. Māori sourced their ferrous reagent in the iron-rich soil, found in lowland swamp lands—repo. The colouring process consists of two treatments; first, the *Phormium* fibre soaked in a tannin solution then submerged into the iron-rich mud. The complexing of tannins and iron particles produces an iron-tannate black. Upon exposure to air, the iron-tannate colourant begins to oxidize, and this reaction eventually causes the embrittlement and loss of strength. The recipe for dyeing black used by Māori varies between regions.

This section describes the selection of consolidates in a comparative study. The fibres and leaf were coloured with natural tannins and, in the case of procuring a black, the application of the iron-rich mud. Previous consolidation treatments applied to iron-tannate treated substrates were reviewed and Klucel-G and Funori were selected in a comparative study with a novel consolidate—zinc alginate,<sup>19</sup>. The evaluation of each of the consolidates was measured by its ability to retain colour, induce strength, and bind the black fibres. The treated black fibres were subjected to artificial aging at eighty per cent relative humidity. After aging, the fibres were compressed into discs and subjected to reflectance spectroscopy to measure the absorption and reflection of light in a spectrum. The reflectance of a sample indicated the inability to retain colour, the absorption indicated the ability to retain colour.

The zinc alginate is a two-part treatment. The 1% sodium alginate dissolved in water was first applied, selected for its compatibility as a polysaccharide like that of *Phormium* and its ability to buffer the acidic products produced by the oxidation of the reactive inherit

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<sup>19</sup> Sodium hydroxypropyl alginate supplied by FMC BioPolymer, PA, USA.

hemicellulose. The di-valent ion 1% zinc acetate dissolved in Methanol was applied after the alginate dried in room temperature for no less than eight hours, proved to retain the colour, and displace the ferric ions responsible for the oxidation of the iron-tannate complex. Furthermore, the alginate binds the fibres together.

### **Application of consolidation on a piupiu and two cloaks**

The development of a consolidation treatment at local level was welcome. The sodium alginate consolidation treatment was much in its infancy and how best to prove the efficiency of the consolidate on an actual Māori textile collection item was considered. As a conservator specializing in the conservation of Māori textiles and concerned at witnessing the continual fragmentation of the black fibres, I concluded that it was important to implement treatment.

The opportunity to trial the application of the consolidate came when a relative asked if I would stabilize her father's piupiu. I explained the development of a new consolidation treatment and she agreed to my proposal to apply it. The client's late father served in World War II and the piupiu was worn during Māori performances when off duty. In fact, his initials were inked into one of the pōkinikini. The client and her family would casually display the piupiu during family gatherings and they wanted to continue this practice, for the recognition of their whakapapa, however the condition of the piupiu did not allow this.

The construction of the piupiu consists of many lengths of *Phormium* leaf strips. Each strip has sections where the green matter has been removed with the edge of a mussel shell, and the fibres exposed. The strips are boiled and contract to cylindrical lengths when hung to dry. Fibrous end section lengths are then woven together with a twining or whatu stitch. When the lengths are woven together the waistband can be woven. Once the waist garment is assembled it is then treated by soaking it in a tannin solution before it is submerged in the paru. The fibrous sections of the lengths are subject to the iron-tannate complexing and result in being dyed black and the non-fibrous leaf sections resist the dyeing process because of the waxy-cutin surface. Collectively, the black fibrous sections make up a pattern.



Of all the Māori textiles the piupiu incurs the most damage because of the way it is put together. The black fibrous sections are subject to stress due to the weight of the leaf sections and gravity. The fragmenting sections of the piupiu presented for treatment required a support and consolidation treatment.

This piupiu was fragile. Obvious losses, some had been retained, compromised the overall aesthetic appearance (Figure 15). The handling of the piupiu had to be kept to a minimum and this required a ‘once-only’ approach. A treatment proposal outlined the procedures to stabilize and was approved by the client. The objective of the treatment was to stabilize the piupiu, restore the aesthetics and provide an archival storage and display system. The piupiu was carefully placed on its permanent support board, and lost lengths were aligned to correspond with the pattern.



Figure 15. Piupiu before treatment.

To provide support and strength to the fragile fragmenting black fibres of the piupiu, a length of dyed muka—dyed with a Solophenyl dye—was threaded very carefully through the leaf and fibrous sections. An extension of the new length provided a means of attachment to the waistband. As expected, fragmentation occurred during the threading of the new length of muka because the inclusion of thread required movement and

manipulation. With the end of the new length, attachment was made to the waist band. The method of reattaching lost lengths was restorative, and the aesthetic value improved. The challenge of applying the consolidate was that movement would cause damage, so a careful application was necessary. The application was done with a soft sable brush and the action was gentle without stroking the fibres. The consolidate was readily absorbed by the dry brittle fibres. The consolidated fibres were left to dry in room temperature, until the next day. The treatment required a final application, also worked with soft brush, of a zinc acetate solution to counteract the oxidative process of the Fe ions. All lengths, those remaining and those lost and restored were treated (Figure 16).



Figure 16. Consolidation and support of pōkinikini.

The piupiu appeared whole after treatment and, whilst the restorative work was detectable, it was not obvious (Figure 17). The consolidated fibres had bound together, although dried to a stiff matrix, and a glisten of the consolidate was evident on close examination. The compromise of losing the flexibility and adding a glisten to the colour, was considered, however restoring, and supporting the lost elements to restore the physical and aesthetic value of the piupiu outweighed the compromise. The piupiu lay flat on its archival support board that acted as a tray within a front wall drop archival box. A supporting cushioned surround was in part placed down the sides and along the hemline to reduce the weight of the lengths and prevent movement.



Figure 17. Piupiu after treatment.

The client was happy with the outcome, and it has been presented to the family at a few gatherings. The piupiu was examined thirteen years after treatment. The restored elements remained in position and no evidence of fragmentation was seen.

A similar application of the consolidation treatment was carried out on two traditional cloaks—korowai and kaitaka—which were among those displayed in the *Kahu Ora* exhibition at Te Papa in 2012. Both cloaks had the iron-tannate black fibres which were showing signs of fragmentation. Consolidation treatment using sodium alginate was applied to those fragile fibres. Investigations into an alternative means of application had resulted in the investment in a vaporizing machine the DSL 2000. Initially, the consolidate was readily vaporized, however, this performance was temporary. The consolidate became too viscous for the machine to vaporize and performed intermittently, so the treatment was continued with application using a soft sable brush. The application of sodium alginate consolidate by means other than by using a brush, requires further research.

A korowai, (WE1892), dating from approximately mid-nineteenth century, is an excellent example of traditional Māori craftsmanship. The size of 1800 mm wide and 1500 mm deep is notably large. The korowai appeared to be in a stable condition overall, however fragmentation of the black hukahuka, which were placed uniformly over the body and more closely around the borders, was observed. The black thrums are tightly plied lengths and are attached to the foundation of the cloak during the weaving of the weft rows, secured in

position with two weft stitches. At the point of attachment, the thrums are placed under stress.

The treatment proposal for the korowai considered the alignment of the thrums and their vulnerability during treatment, installation and deinstallation. A display mount which was to be positioned at no more than a 45-degree angle, was first prepared to receive the cloak prior to treatment. With limitations on treatment time and access to thrums over the main body of the cloak, it was decided that only the thrums around the border would be treated.

What was the performance of the consolidate? The main objective of the consolidate was to physically retain black fibres as part of the structure of the textile. This could be achieved by inducing strength, the woven matrix would be retained and the mātauranga preserved. Considerations to retain properties that are typical of a textile thread, such as colour and flexibility, were secondary. The shiny appearance of the consolidate was not ideal nor was the use of a brush to apply it. While conserving Māori textiles, the performance of sodium alginate should be further evaluated.

### **Evaluation of consolidation**

In recent years, the Auckland War Memorial Museum was preparing to rehouse their Māori textile collection and engaged with the Otago University's textile department to investigate the efficiency of sodium alginate consolidate for the treatment of their fragile Māori textiles. I contributed to this research by submitting traditionally dyed black *Phormium* fibres. Two sources of paru from different locations and two types of tannins were used to dye the fibres black. A sequence of concentrations—0.25 per cent, 0.5 per cent and 1 per cent—of sodium alginate were applied to a small bundle of fibres. The fibres were manually extracted from a variety of flax, ngutunui, which was sourced locally. The fibres were then subjected to a series of analyses to evaluate the performance.

The analytical tools employed in the evaluation were selected to measure the efficiency of the sodium alginate in retaining the colour, inducing strength, and reducing acidity. The research concluded that whilst the effect of applying sodium alginate to the black test fibres had negative effect on the colour and strength it did reduce acidity and stability in light aging. Further research is recommended to investigate aqueous and non-aqueous

consolidation treatments. Future research should investigate the performance of other divalent ions, capable of complexing the oxidative state of the ferric ions. The research noted a differential rate of deterioration between the two tannins; the gallotannin—hīnau—and condensed tannin—mānuka. This suggests that further research into the use of other tannin sources used for pre-treating *Phormium* prior to the application of an iron-rich mud would be profitable. The performance of sodium alginate was compared to another consolidate carboxymethyl cellulose (CMC) Ac4. The performance of the CMC Ac4 proved more effective in retaining colour after tests of artificial ageing.

The development of CMC Ac4 and its comparable performance to that of sodium alginate was realized. To treat a korowai belonging to my family's collection, the application of CMC Ac4 was considered. The korowai had numerous hukahuka that were barely attached to the foundation of the cloak, and in some cases only single fibres, retained the length of the thrum with the cloak. In preliminary tests CMC appeared less viscous when applied with a brush and no shiny appearance resulted. Archival board was covered with cotton flannel then with washed homespun cotton to receive the korowai. The display case could only accommodate the cloak in vertical display.

The application of CMC to fragile thrums required further support. To reduce the weight of the thrum on the single fibre attaching it to the foundation, a securing T pin—a nickel art pin—with a wrapping of Japanese tissue coloured to match that of the black thrum, was carefully positioned between the two-ply thrum with sufficient pressure to secure it into the archival support. The T pin provides a secure positioning and reduces the weight of the thrum on the single fibre, without placing tension as would result from a stitch of thread.

To sum up this section of the chapter, I would say that the success of museum conservation of black fibres in Māori textiles is varied and takes a relatively long time between experiments. All aspects are considered including the treatment being reversible, providing support, chemical intervention, and the use of a T pin. Museum attempts to investigate and research the best means of conserving taonga have been significant, however, to date no one stabilization treatment for dyed black fibre is recommended as tested and proven. This mixed scenario leaves those examples of traditional Māori weaving under cover in the

storage of our museum, not in a condition for handling and display, and without contact with their descendants let alone with the public.

### **Heritage material analysis and characterization**

Material sciences research into museum objects is widespread. We begin by identifying what the material of the artefact is and, in most cases, we realize that the material is aged and or degraded and, therefore, the anatomy of the material is not true to form. The analysis and identification of plant fibres that make up taonga kākahu have been carried out by the University of Otago's Department of Applied Sciences. An interdisciplinary study investigated the application of polarized light microscopy, and this proved that this means of analysis can assist in differentiation between plant species typically found in Māori textiles (Paterson et al. 2017, 965–979).

It is one thing to identify the material, however the substances that have treated the fibre thereafter, as in the process of dyeing *Phormium* fibre black, require another means of analysis. As previously mentioned in the introduction, elemental analysis of the source of iron within the iron-rich mud was a preliminary scientific analysis proposed to better understand the chemical reaction of the iron source with the substrate of *Phormium*. There are so many sources of natural iron ores, each with certain charge or reactivity, that at this point it can be appreciated that the application of a substance to stabilize the dyed black fibre is a long way off. It must be realized that scientific analysis of the materials and their composites is a very drawn-out, expensive, and sophisticated process within the museum. It must be considered that the time required to carry out the analysis, the overall scientific approach, the human hours input and costs for material science may in some cases not result in the stabilization of the artefact. In this case we have variates of the stabilization of the dyed black fibre and many years have passed since the first research began, in fact almost 50 years—a half-century. The museum must also accept that in this time it is possible that a few fibres have been shed, and a loss of weave has resulted. In the practice of conserving the artefact, material research science has its limitations in producing results within a timely manner, particularly if there must be a chemical intervention that is irreversible. It would seem in some respects that if we were to consider timeframes and the possible damage within that timeframe and the exposure or lack of the artefact then we

would consider proposing a system of supporting an artefact for display, so that there is a means of connection.

As described above, this was the situation with the World War II piupiu that I consolidated and on which I reattached the lost pōkinikini lengths for a private client who was prepared to subject the piupiu to an experimental means of consolidation—with the novel application of sodium alginate consolidate. Prior to this treatment, however, the client and, indeed, her family did wait almost a decade from the time they agreed to hand it over for stabilization. Discussions were then had that conservation science was investigating a means of consolidation for the iron-tannate fibre, and that an irreversible treatment by chemical intervention was the only means of stabilization. To this the client agreed and patiently waited for the conservation science to take its course.

This finally eventuated in the application of sodium alginate—a polysaccharide seaweed derivative diluted in distilled water and applied in this case with a soft sable brush. The application of the alginate binds the fragile fibres together. The second part of the treatment required the application of a divalent ion-zinc dissolved within an alcohol, the purpose of which was to interfere with the electron transfer that previously in its unaltered state would cause the oxidation of the ferric and ferrous ions that would result in the acidic nature of the fibre. The consolidation treatment also required threading with a synthetic-dyed black length of muka through the detached lengths then securing the supporting thread to the waistband of the piupiu, acting as a core thread upon which the consolidation treatment could be applied to bind the fragile fibres. The after treatment certainly improved the aesthetic value and pleased the family who were able to display the piupiu at family gatherings. So, perhaps the social value and engagement with people, which Sully (2015) has argued is the heart of postcolonial conservation practice, are more important than the material fabric itself.

This consolidation treatment was the first time I had worked on a taonga in a private collection. I have since done one other piupiu in much the same condition again for a private collector. For the *Kahu Ora* exhibition the sodium alginate was used on the hukahuka of a korowai. The application was done with a nebulizer, which produced a fine

vapour therefore, an improvement on the use of a brush, however, it was short-lived with some mechanical fault in vaporizing the consolidate.

The consolidate was, however, subject to further scientific evaluation. As noted above, in 2016 as the Auckland War Memorial Museum prepared to relocate their Māori textile collection to a new storage area, they brought in the expertise of Otago University's Textile Research Laboratory to find the best means of stabilizing the fragile black fibres in their Māori textile collection. During this, the sodium alginate consolidate was evaluated for its efficiency (Smith 2016). I discontinued use of the sodium alginate and zinc acetate consolidate, until such time that research has proved their efficacy. The evaluation process is standard practice in conservation science and, in comparison to other consolidates evaluated, the sodium alginate has proved to cause colour change after artificial ageing equivalent to 400 museum hours. Interestingly the criteria to evaluate the performance of the alginate initially was primarily to induce strength, secondly to retain colour. The course of time taken to develop, implement then be evaluated would have taken just over ten years.

Looking back and reflecting on this process, it would be fair to say that in the museum world, taking years leading into decades or even centuries for an artefact to be waiting to be stabilized is commonplace, and it can remain in storage until such time that stabilization can allow it to be displayed. This is a questionable outcome, however, in terms of the value of community engagement in conservation theory, this is important (Sully 2015). I would argue that timeframes for managing taonga kākahu in storage now need to be re-evaluated. It is no longer good enough to consider only the scientific analysis of materials. We must consider what benefit this provides and provokes for a people wanting to reconnect with their intellectual property from which they have been alienated through the colonial experience.

The hugely important Treaty of Waitangi document, for example, has finally been put on permanent display at the National Library, and rightfully so, for any citizen of Aotearoa to view this founding document—ironically with obvious losses and signs of neglect before its time of stabilization. In this case, however, the losses are accepted and where possible the signatures are highlighted in accompanying supporting text. The decision to display the Treaty permanently required some scientific research and, in this case, concentrated on the



protective case and environment in relation to the ‘breathing’ of the document and, in fact, whether the ‘breath’ of the document would discontinue by removing oxygen. This is an extreme measure however it is one that preserves the artefact by eliminating all possible chemical reactions between the artefact and the atmosphere. The word ‘breath’ is introduced here as a metaphor for the living artefact, that which is physically past its utility or functionality but is still full of its cultural integrity, with or without damage or loss. In fact, the word ‘hau’ which suggests breath, and vital spiritual essence, is associated with taonga seen by Māori as living things. This is quite a different, indigenous perspective on material culture, which conservation must acknowledge if it is to help museums care for taonga in culturally appropriate ways.

### **Limits of conservation: “Will we ever see our kaitaka?”**

The degree of black fibre degradation in Māori textiles varies, but in all cases the fragmentation is continual. In two cases discussed here the greatest degradation of black fibres appears in traditional kaitaka, one of these housed at Te Papa and the other at the Auckland War Memorial Museum, (52069). These cloaks have never been displayed because of their condition, although the kaitaka at the Auckland Museum has been viewed by visitors to the storeroom. Both the cloaks have been placed on fabric, the one in the Auckland Museum is laid flat and the one at Te Papa is rolled into a large, padded roll. Understandably, the kaitaka have never been considered for display and their cultural knowledge remains unknown or disconnected from iwi, hapū and whānau.

As conservation is the practice of stabilizing artefacts and preventing further damage, unfortunately the role does not include the authority to make curatorial decisions, which is the domain of the curator. The conservator can provide stabilization regardless of the artefact’s condition and for this reason, the fragile kaitaka could be brought out of the store and displayed informing the visitor, researcher and/or public, by providing optimum support. In my view, the museum visitor should be educated on what materials were used how they were processed, and, in this case, what has caused the deterioration. Technology can further inform by providing an image of what the cloak would have looked like in its original state. In my role of conservator, I would propose that the fragile black kaitaka be placed in the exhibition on a dyed black—to match that of the black fibre—and smooth

supporting substrate. This proposal is not novel. Some of the oldest and most fragile textiles from early civilizations are displayed, albeit only a fragment. In doing so, my role as conservator crosses over to curatorial work, and this perhaps suggests the roles should be integrated in the case of kaitiaki Māori. This is quite different to the increasing specialization and differentiation of roles experienced within the contemporary museum.

The practice of material science in conservation for the stabilization of artefacts is understandably necessary as it provides information that allows stabilization treatment and how to prepare the artefact for storage or display. It determines the environmental or atmospheric changes that will cause any change to the fibres of the artefact. It can certainly be appreciated that material sciences consider all elements that can affect or change the make-up of a fibre at a molecular level and for this reason a sophisticated means of analysis is necessary. But problems remain, especially for indigenous people wanting more immediate and open access to their cultural heritage in museum collections. Conservation is a huge constraint as there must be a degree of patience for very well-thought-out methods of testing and evaluating and, in some cases, the research does not provide a means of stabilization. It can be appreciated that conservation science is conducted at a molecular level to predict and or control reactions in chemistry. The reactions at a molecular level can alter the physical state in matter that eventually can result in either stability or deterioration.

This is the conservation science thinking that is set out in the practice of stabilizing artefacts and it is an approach that is and will continue to be supported in the museum. But it needs to be an approach, while stabilizing an artefact, which does not compromise or interfere with the time of connectivity or appreciation by the museum visitor or more specifically the tribal community who are intimately associated with those taonga. In this scenario, I advocate that the museum should approach material sciences as an analysis of the material and its processes but do so by collaborating with the practitioner or those connected to the artefact. For example, the iron-rich muds, the tannins, the weaving techniques, the construction, the moving of the different elements that provide the strength or have vulnerabilities or weaknesses, in all this I would say that the practitioner should work alongside the conservation scientist, so that science and mātauranga Māori, weaving skills and knowledge are working together.

When conservation scientist Vincent Daniels from the British Museum travelled to New Zealand to witness the process for dyeing black the fibres of *Phormium* treated with tannins in an iron-rich mud, he observed the environment, the practice of processing and the procurement of materials, in collaboration with my mother an experienced and expert weaver. In this partnership of weaver and scientist there is more likely to be a connection with nature for both participants and, certainly for the practitioner, in this case for my mother, a connection to mātauranga Māori, the coming together of conservation science and mahi kākahu in the common interests of preserving cultural heritage.

### **Conservation science research and taonga**

Conservation science is an intricate practice of sophisticated analytical research, which can be time-consuming and costly. The practice of conservation relies on material science research, it has thus far informed conservation with the recommended materials to support artefacts, stabilize artefacts and recommended the ideal environmental control for the stability of artefacts in storage and display.

Conservation does adhere to criteria while stabilizing artefacts which includes ensuring that intervention is minimal and, where possible, making the treatment reversible. A chemical intervention is difficult and, in some cases, not possible to reverse, for example, a wet clean or consolidation. The wet clean, however, is carried out to dislodge inferior substances that can cause deterioration of the fibre. In the same instance the breaking or fragmentation of fibres can be consolidated to bind them together.

The conservator charged with the stabilization of the taonga, is committed first to identifying the materials and construction of the artefact. The structure composition and condition of the artefact will determine the best course of stabilization. Material science research that supports the practice of conservation is subject to the course of time and analytical trials and, when applied, material science should ideally be reversible. During this research I have observed that there are artefacts that remain in poor condition in the museum storerooms. Apart from the privileged visitor to the storeroom, to view some of these special artefacts, generally artefacts have no exposure, no connection with people. This is a problem for Māori, as I have pointed out above, in terms of accessing and utilizing

the power of taonga for important contemporary social work in the form of identity and community building.

Things need to change, and this thesis, which reflects on my conservation career, explores the ways in which science and the knowledge of Māori weavers can be brought together. The museum could support the engagement of the practitioner and conservator in practical workshops that work with materials and the processes involved in the making of taonga. In this practical exercise the conservator can be informed about the people and their material culture, the connection with natural resources and the protocols observed during the procurement of those materials. The train of thought of the practitioner or weaver in processing and weaving cloaks preserves the thought process of that culture, the intellect and the mātauranga. The kākahu, rāpaki, pukupuku, kete, whāriki and other works that make up Māori textiles, are testament to the intellect of Te Ao Māori. They are not just inert material objects that are the subject of the western scientific gaze, they are taonga tuku iho, treasures handed down. As Sully has argued, conservation is ultimately for the people, and so the museum conservator should be knowledgeable in this cultural practice. This knowledge can inform the museum visitor and, indeed, other practitioners or weavers. While research finds the best means of stabilizing the dyed black fibres of our korowai that have never been seen before, they remain in museum collections disconnected from their people.

Recently, I changed my mind about the fragility of taonga kākahu and the restrictions this condition places on the exposure of the taonga. At the beginning of my career, I found it acceptable to keep fragile taonga in optimum storage, remaining there without movement or contact, to retain what physical integrity it had. This practice however does not consider the disassociation of those who should be more culturally connected to taonga. Conservation practice and museology should consider the social impact on those who have been removed from their lands and cultural identity by imperialism and try to redress this by reconnecting cultural property to those forcefully alienated from it. I am now of the mind that regardless of the fragility of early taonga kākahu, it is those treasures that require every effort made to reveal this cultural property to their descendants who have never seen them.

To express the new vision of bicultural museum conservation I proffer the example of my commitment to maintaining and exposing the mātauranga of a korowai at Te Papa (WE1892). This korowai is amazing, heavily adorned with hukahuka and sparingly with some fine lengths of pōkinikini. The thrums are very finely plied, with a tight ‘Z’ twist at a 45-degree angle at less than a millimetre apart in the finest of them, at lengths up to 150 mm (Figure 18). As a weaver I think of the fine execution of preparing fibre and plying over the thigh in the making of the cloak.



Figure 18. Detail of ‘Z’ twist in relation to millimetres.

The condition of the hukahuka is such that they are losing fibres. This is evident in the fibre dust that covers the foundation of the cloak. They are tangled and distorted, however, the thrums are relatively stable overall, with no obvious signs of the detached thrums which are most common for this type of cloak. Considering the age, estimated to be more than 150 years, and the fact that the tight twist of the thum remains intact, this taonga is most worthy of sharing with the public through display. The korowai can continue to hold its form for as long as it is supported and is not subject to stress that would cause further fragmentation. For this I propose that the positioning of the thrums be untangled and aligned, while surface cleaning of the foundation is undertaken to remove the dust of black fibres. A smooth archival material would be in direct contact with the reverse of the cloak and where necessary be padded to accommodate the aho poka—shaping rows—which would immediately be an improvement from its current flat position.

The treatment would be extensive and be prerequisite to a consolidation treatment, in due course. The proposed support requires the securing of the korowai in position to minimize movement and direct handling of the cloak. In this case the attachment to the support system would be permanent. This permanent support can also be used as a display mount, therefore transferring from storage space to display case. As were the fragile kākahu in the *Kahu Ora* exhibition spoilt for space, so should the display case be of sufficient space to accommodate the supported korowai at a comfortable 45-degree angle, flat display. The condition of the korowai is the focus of this discussion, in that, while previously it was considered too fragile to display and without provenance it was not considered to be of exhibitable quality, it is an excellent example of traditional Māori weaving. Furthermore, it is an excellent example of what a korowai really is. I would propose that it be prepared for display and that the promotion text provide more clear interpretation. Accompanying text and images can inform the visitor of the meaning of the name, the dimensions, the weave count with a detail image, the weaving technique and, of course, the material and its processes. As much information should be supplied as possible.

However, the problem remains, despite all this progress described above in heritage materials science and what I have called bicultural museum conservation, there is a serious lack of provenance of cloaks in museum collections. One of the roles of the curator is to provide, where possible, the provenance of mana taonga in the museum's collection. The provenance supports the narrative, as an educational directive of the museum. It is apparent that the vast majority of the kākahu in the collection stored at Te Papa have no provenance. As noted above, the Auckland War Memorial Museum has simple card records accompanying some of their kākahu. The records in most cases note the donors and the locations of their acquisitions. In a few cases the records have noted the person receiving the taonga and a few cases even note the maker or weaver of the kākahu. Also, at the Auckland Museum the work of former ethnologist David Simmons lists Māori textiles kept in museum stores abroad, and in a few cases the location of acquisition is noted. In most cases the plant and or fibre material is visually identified as harakeke or muka, however the origin of the plant material is not. The weaving techniques provide no substantial evidence of provenance because the weaving technique is consistent, however the preparation of materials differs, and this is evident in the dyed material and the overall construction. Some

of these features can be seen in the variation of hues in black and to a certain degree in the browns and yellows. In chapter three I discuss the variation in blacks and browns.

## **Conclusion**

Conserving taonga is my primary role as a conservator, but as a bicultural museum conservator I feel I also need to consider the preservation of the mātauranga, the tangible and intangible values of Te Ao Māori, and to reconnect the ancestral treasure taonga to its tribal community. A serious situation arises when the physical loss of elements completely removes the mātauranga or the narrative of knowledge development. As shown in this chapter, the kaitaka is a taonga that often has lost elements in the tāniko, and conservation should advocate and/or execute a means of arresting this deterioration. Having contributed to several research projects, described above, investigating the deterioration and stabilization of the black fibres and the nature of the iron tannate complex, it is possible for me to appreciate how scientifically challenging and analytically sophisticated the conservation research can be, as the nature of the iron tannate can present so many variables.

But it is debatable whether this lengthy and still unresolved issue of stabilization should be the sole focus of conservation when new thinking in conservation theory sees the practice refocusing on values and people as integral parts of the new museology. We can wait for science to stabilize those fragile kākahu and perhaps in the meantime conduct a series of tests to identify the best means of supporting the fragile parts until such time that stabilization and, indeed, its method of application are available. Generally, the consolidation treatments that have been developed are promising, however, there remains the question of how best to apply them, and this is especially important considering that the use of a brush may be too harsh on the fragile fibres.

Other and more urgent issues must be considered. Museology in Aotearoa should realize its ethical and political obligations to address the problem of the disconnection of the people from those taonga that have been in their care. There are people who for too long have been alienated from or have no knowledge of the mātauranga imbued within these fragile kākahu. In this situation collaborative discussions about the ethics of both conservation and

the principle of mana taonga should take place for the betterment of those who descend from them. It is this question that the thesis now addresses: how can we bring together science and mātauranga Māori, that is conservation and practitioners, for the care and knowledge base building of taonga in such a way as to reconnect them to the people of the land?



## **Chapter three:**

### **What is your black?**

#### **Identifying the black dye recipe as an approach to reconnection**

##### **Introduction**

It was at the very beginning of my career that I envisaged one day having to gather paru samples to analyze what it is that causes the deterioration. This is another impetus for this study as discussed in the previous chapter. Almost decades later I found myself in the position of having to go into a field and gather iron-rich mud samples, certainly to support or learn of the material deterioration but also to identify different practices that produce different hues of black-dyed muka. From this field work, I gained an understanding of the environment of each site and the historical content of its people and land settlement. This type of research provokes a connection or reconnection for tangata whenua to an almost lost practice that embraces their tūpuna signature that lies in taonga kākahu.

This chapter describes the field work of engaging with tangata whenua in gathering their resources typically used by their tūpuna for dyeing muka black. Recognising that the geographical location and historical land formations can assist in identifying soil content and plant material resources, the gathering of materials and information also supports identification of the black dyeing processes. This may link some of those black fibres found in historical kākahu to the place of manufacture. The task of collecting materials and information when engaging with community members, be it individuals, family, hapū or iwi, is one that is treated with the utmost respect according to ethics guidelines. Research practices with Māori need to observe a respectful discourse because the mātauranga researched is historically unique to those people of that region.

This part of the project took into consideration that since European contact and two centuries of colonization, deforestation, and the development of agricultural practices, it was likely that mud sites would have been lost or degraded. The *Historical New Zealand*

*Atlas* identifies the colonial impact on forestry and indeed Māori. (McKinnon ed.1997, plate 30)

### **Fieldwork: Research with tangata whenua**

Having a strong background in the weaving community role as a conservator specializing in Māori textiles, I made contacts with weavers to seek their contributions to the research project. The contributors to the research were informed of the procedure for the collection of material samples, dyeing processes, analysis, interpretation, and the dissemination of information. Once it was verbally approved, a copy of the research information, questionnaire and consent form was sent to the respective contributor of samples and a time to carry out the work was put in place. In some cases, the contributor of samples could be a different person to the person contacted who could be a representative of a trust, iwi, hapū or wānanga.

The etiquette of engaging with tangata whenua is governed by the protocols or kawa of that tribe. A conversation with the contact person prior to the visit prepared me for the initial welcome and procedure throughout the course of gathering materials. When the formalities had been carried out, I presented an overview of the research project and asked that the property owner approve of the collection of samples by signing a consent form. I kept a copy and left a copy with them.

During the collecting of iron-rich muds and tannins, discussions were had about the history of the area and the use of the site, its relation to early settlement and what encounters were there, if any, between Māori and European around the time of contact circa 1800. It was considered that this information might provide links to the exchange of taonga between Māori and European and assist in the enquiry into how the exchange took place, whose hands gave and who received taonga kākahu. An example of one such encounter is that which took place in the late eighteenth century at Moutara Island between Cook and “New Zealanders”—Māori—with the exchange of fish, war weapons and ‘cloaths’ for nails and old bottles.

In terms of methodology, as discussed in the research design section of the introduction, several sites of geographical representation of the North Island and only one from the South

Island—Okiwi Bay—were visited. Few sites were known in the South Island and only one other in the lower part of the South Island, came to my attention well after the field work was completed. Depending on the tikanga of tangata whenua, a karakia was said at the site before the collection was carried out. At least two kilograms of paru was collected using a metal corer or by digging down into the mud with a shovel. The mud sample was contained in a plastic clip-top container and stored in a fridge as soon as possible.

### **Collection, treatment, and analysis of materials**

#### *Tannin waiwai:*

Collection of tannins required a sharp implement or small axe to cut the outer bark or take scrapings from the trunk. For the collection of bark pieces, where obvious removal exposes the inner bark, a pasting of moist soil and or mud was covered over the exposed area, serving as a ‘band-aid’ over a wound. This practice is common in tikanga of Te Taiao.

#### *Tannin treated muka tester:*

Prior to visiting the site, *Phormium* fibre was treated with the hīnau tannin and used as a standard tester to see if iron was present in the mud sample, proven by the tannin-treated fibre colouring black. This measure was taken if no tannins were available. In most cases this experiment was not proven until at least eight hours had passed.

#### *Examples of taonga dyed with paru:*

The client was also asked whether there were any examples of taonga having been dyed black with the source of mud that was being obtained. If there were examples, then these were examined, noting any typical hue of black and its condition. Colour measurements of the black fibre in the taonga could not be recorded because insufficient fibre could be amassed.

#### *Muka for dyeing:*

Only one source of muka was used, this was extracted from the taeore variety common to my region. The muka was extracted with a mussel shell, soaked overnight then, once the soaking water was changed, left for another overnight soak. The soaking removes the green

chlorophyll residue that stains the fibre. After the second soaking the cleaner fibres are hung out to dry.

*Tannin treatment:*

Approximately one kilogram of bark pieces was left to soak for two days covered in cold water in a stainless-steel pot. The muka was submerged in the tannin solution and brought to a soft boil, then the heat was turned off and the muka was left overnight. The tannin-treated muka was then removed and hung to dry in room temperature.

*Paru treatment:*

The tannin-treated muka was then rubbed with approximately two litres of paru and submerged and left overnight. The removal of the muka is best done during exposure to bright sunlight. This method was employed by my mother and grandmother, as a means of letting the warmth of the natural light fix or complex the tannin and iron-rich mud to the fibres. The exposure to natural light would be for no less than an hour. After an hour, the fibres are thoroughly rinsed and hung to dry. The result should be black-dyed muka.

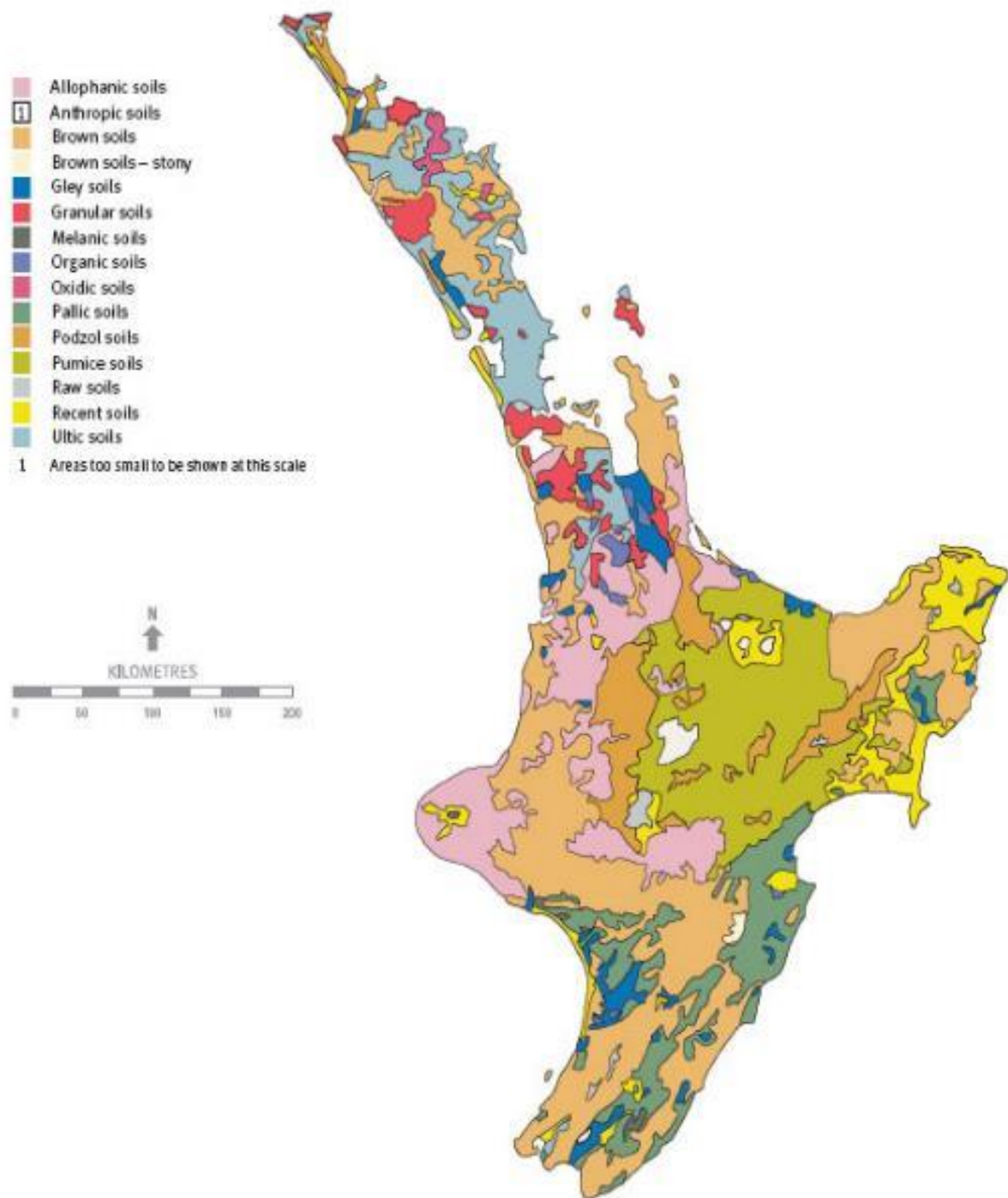
*Samples prepared for colour measurement:*

The dried black fibres were then prepared for colour measurement. The fibres were cut into snippets of no more than 2 mm long, then compressed into a pellet under a regulated pressure, this produces a uniform shape.

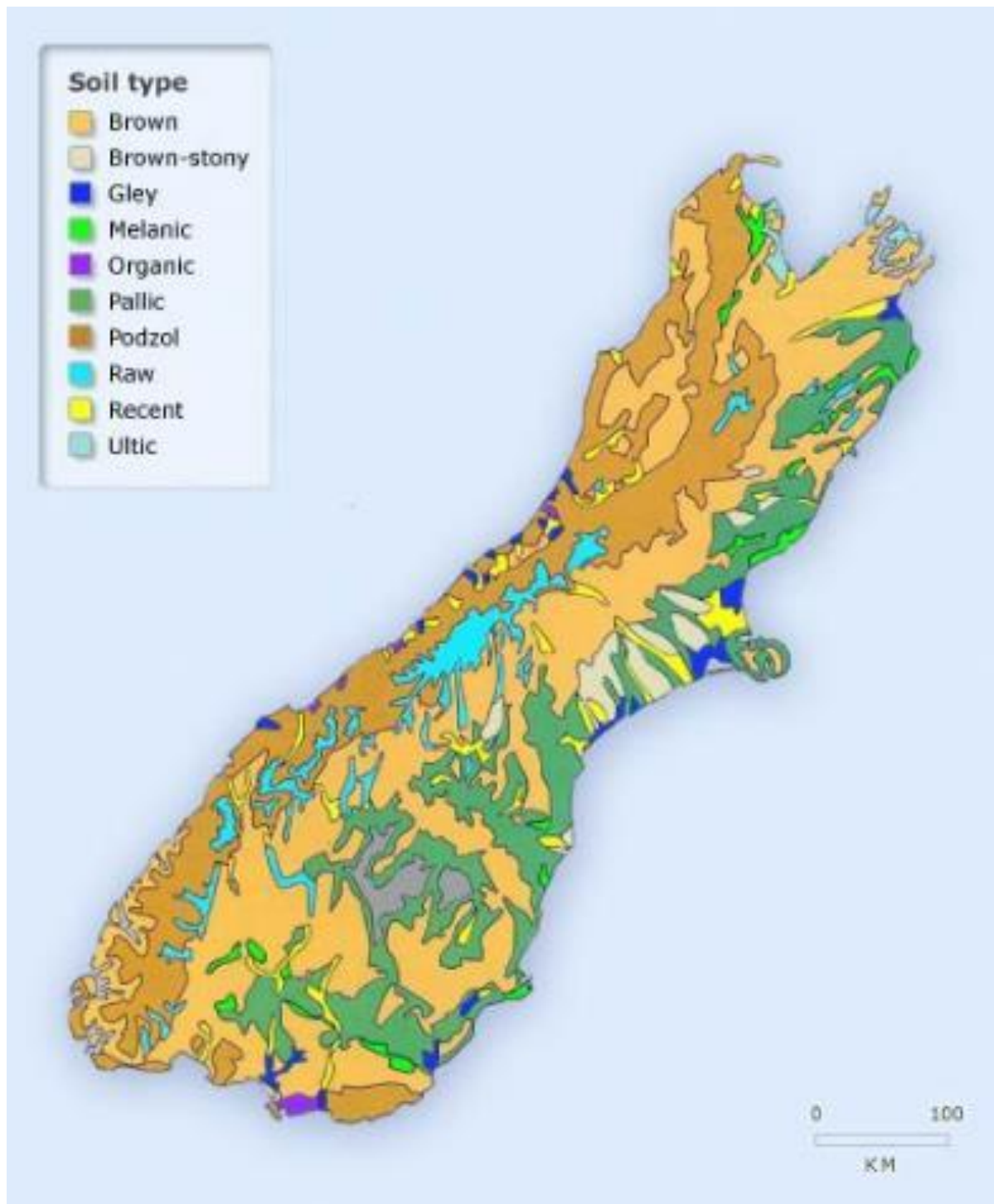
*Colour measurements:*

Measuring the colour value of the modern dyed fibre was carried out with the use of the Konica Minolta Colour spectrophotometer CM-700d/600d. The colour metre provides colour value based on the international organization for measuring colour and light, the Commission Internationale de L'Eclairage (CIE), and the L\*a\*b\* colour space referred to as CIELAB, applies here. This measurement helps to identify the dyed black fibres darkness or lightness with any hue of a base colour, for example a black fibre with a slight hue of red.





<sup>1</sup> “Soils of the North Island,” and “Soils of the South Island,” *Te Ara: Encyclopedia of New Zealand*: <https://teara.govt.nz/en/map/12300/soils-of-the-north-island> and <https://teara.govt.nz/en/map/12777/soils-of-the-south-island> (accessed 1 May 2021).



*Oparure iwi: Ngāti Maniapoto, hapū Ngāti Kinohaku*

The first site visited was on my family property, located approximately seven kilometres north-west of Te Kuiti, of Ngāti Kinohaku hapū (subtribe) to Ngāti Maniapoto, also neighbouring hapū of Ngāti Rora. A history of Māori holding fast to their lands is known for this region and relationships with Europeans during most of the colonization period were tested. Europeans were prohibited, and no noted engagements occurred under the reign of King Tawhiao. It was, however, in the early 1880s that he relented to an empowering European force and, alongside the then chief of Maniapoto Wahanui, negotiated the development of the main-trunk railway line passing through the King Country.

The geographical reference key for this region notes deposits of calcareous, sandstone, pure bioclastic limestone and basal coal in south Waikato. Two major limestone quarries are within ten kilometres of this site. The popular tourist attraction of the Waitomo glow worm caves is in the next valley, again less than ten kilometres away.

This site, although a relatively modern site used by my grandmother and mother since early 1900, produces an iron-rich mud. A gentle brook located on the outskirts of a small native bush has a few nearby streams that all originate from a natural spring and limestone cliffs and mounds surround the site. The stream that was frequented by my peers is nowadays no more than two metres wide and shallow enough to tread with water up to calf-height, certainly not the same place that was once used but rather two to three metres upstream. The vegetation remains the same with an abundance of kawakawa (*Macropiper excelsum*). The water is clear-running, and no obvious life of freshwater crayfish remains, as there was in my youth. While the surrounding farmland is leased for cattle grazing once a year for the past fifteen years, it was mainly a sheep farm during my upbringing. This stock grazing did not appear to have any effect on the health of the paru site (Figure 22).

The mud was collected with a shovel and when lifted from the shallow streambed revealed some grit and a few small pebbles, which I do not remember seeing as a teenage bystander. There was, however, sufficient mud of a deep grey colour that felt mainly smooth, that I could collect for the project. To my memory the submersion of the tannin-treated textiles by



my grandmother and or my mother was adequately covered with a consistently smooth, deep grey mud. The rubbing of the mud into the textile was carried out prior to it being totally submerged and it remained in the mud for 24 hours. Hopa describes this process at this paru site (Hopa 1971, 30) For this project, the muka extracted from taeore was pre-treated with hīnau.



Figure 22. Narrow clear stream with paru.

#### Waiwai, Tannin:

The primary tannin used by my family is that of hīnau and was sourced some twenty kilometres from the paru site. Pōkākā (*Elaeocarpus hookerianus*) is also available in the region located mainly on the low swampy wetlands, and for this reason was not the preferred tannin to obtain. The outer bark was stripped from the tree's trunk by first cutting into it with a small axe and peeling away the outer bark. As with traditional practice, tikanga prevailed, a karakia was performed, and a pasting of moist mud was applied to the inner bark exposed after the removal of the outer bark. Māori believe that this practice encourages a healing phase<sup>21</sup> (Figures 23 and 24). On one occasion the pasting of mud from a nearby stream to a pōkākā tree later revealed an iron-tannate complexing reaction resulting in the colour black staining the border only, of the outer bark's edge (Figure 25).

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<sup>21</sup> Kahu Te Kanawa, personal communication with the author, 23 June 2020.



Figure 23. Removal of hīnau bark.



Figure 24. Pasting of mud.



Figure 25. Tannin of outer bark of pōkākā, reaction to pasting.

The next site visited was at an estuary on the west coast of the Far North district of the North Island at the settlement of Ahipara—“Sacred fire”—the southern beginning of the popular Ninety-mile Beach, Te Oneroa-o- Tohe—the long beach of Tohe. The Far North was the first region for European settlement and the encounter between the two cultures was one of both intrigue and angst. It is likely that during the encounters, exchanges were made between the two cultures. Māori were interested in the application of metal implements made of iron and even exchanged taonga for nails (O’Malley 2015). In a reciprocal nature Europeans were interested in items representing the natives of the southernmost inhabited land. The French also settled in the Far North, although their encounters with Māori were more tumultuous.

The geographical reference key for this region notes that it consists of beach sand, gravel, peat, and mud (Edbrooke 2017). Being close to the seashore, less than a kilometre away, which in general maintains a constant form, suggests that the site could be much the same today as it was in traditional times. The approach to the site was informal and the contact felt comfortable about this. As a child, she had accompanied her grandmother to the site and assisted with dyeing Māori textiles, mainly piupiu, furthermore, she gave me a sample of a pōkinikini that had fallen from the waist garment.

The collection of mud was relatively easy to access at a river’s bank. The mud was completely covered with water approximately knee-deep at high tide. When dug up, the mud revealed a thin film of fine brown soil on the top and the rest was notably a dark charcoal colour of smooth consistency (Figures 26 and 27). There was no vegetation on either side of the river, other than a lone tī kōuka (*Cordyline australis*, cabbage tree) near the riverbank and the land was bare of any stock at the time, although the ground appeared to have stock hoof marks.



Figure 26. Ahipara riverbank paru site.



Figure 27. Collecting iron rich mud.

#### Waiwai, Tannin:

The contact was not familiar with the source of tannin used by her grandmother, however, she mentioned that pōkākā was common to the region and indeed a small settlement is named Pōkākā on the eastern side of the Far North. The mud collected was applied to the pre-treated hīnau fibre, which resulted in a black-coloured fibre.

#### *Rotorua iwi Te Arawa*

Infamous for its pungent smell of hydrogen sulphide, Rotorua has been one of the country's most visited tourist attractions for more than one and a half centuries (Pope 2009). Located on the Volcanic Plateau that features geysers and bubbling mud pools, it was a place of Māori settlement during the fourteenth century where they utilized these natural resources for their daily activities, including cooking and bathing.

The son of Emily Shuster, a prominent weaver who for several years was close friends with my mother, grew up in this environment. My contact with him, seeking direction on where to collect samples of iron-rich mud and tannins for the research project, was well received. A visit to Rotorua was planned and the collection of both mud and tannins was carried out



(Figure 28). The site was one that his mother and those before her had used to dye their textiles black.

The site was shaded by tall, introduced redwood trees and was barely recognizable through the thick groundcover of fallen leaves and vegetation. The collection of the mud sample was challenging to those unfamiliar with the site, and this task was taken up by the contact. Using a spade, he dug up a reasonable amount of mud which felt damp to the touch but not as wet in comparison to the other mud samples.



Figure 28. Rotorua site.

#### Waiwai, Tannin:

For the collection of tannins, we returned to the contact's home, where he had available a good supply of tannins growing around his property. The tannins included tawhero (*Weinmania racemosa*), mānuka and kānuka (*Kunzea ericoides*), and samples of each of these tannins were collected. The tester, hīnau-treated fibre, resulted in a black when the collected mud was applied.

To the best of his knowledge the tannin used by my contact's mother was varied and, in most cases, depended on what resources were available at the time. In personal communications with my mother about what tannin sources were used in the Rotorua region, she confirmed that her good weaver friend—my contact's mother—had often used either mānuka or kānuka or a combination of tawhero and tutu.

### *Ruatoria East Cape, iwi Ngāti Porou*

The most eastern region of the country, that claims first light of each day, was the first place where Captain James Cook arrived in the late eighteenth century. The coastal line exemplifies the beauty of the untouched isolated region and Captain Cook and his crew felt comfortable enough to stay. During their stopover at Tolaga Bay for a total of six days, Cook experienced the local hospitality of Māori, being presented with food and gifts, although records suggest the Tahitian navigator Tupaia in Cook's company was the attraction (O'Malley 2015).

A member of a family trust located in Ruatoria, who descends from one of the local Māori who engaged with James Cook during his visit, expressed an interest in the research and invited me to collect a sample of mud from their family site, which was gladly accepted. Five family members were in attendance to visit the site which made for a special occasion with a traditional Māori welcome, a karanga, by one of the family members.

The site (Figure 29) was located not far from a gravel country road in a slight decline of rolling pastures. The site was a pond with a single cabbage tree at its edge. A few clusters of trees were in the distance, but mainly the pond was very exposed. It was evident that cattle had trampled the pond's edge and for this reason, the family were proposing to fence the pond pending on how useful the mud source was in dyeing fibres black.

The sample of mud was relatively easy to obtain, although trying to collect a sample further in from the pond's edge and of reasonable depth, meant treading well above the knee. The mud was smooth to feel and included some of the vegetation matter that covered a good part of the pond's surface.



Figure 29. Ruatoria paru site.

The family had a good history of the mud site, disclosing that their grandmother and generations before had used the iron-rich mud for dyeing textiles. Some fragments of woven whariki floor covering exhibited the dyed black elements, which were in the typically degraded condition. The family did not know what tannin type the past generation of weavers used, however, they remarked that both mānuka and kānuka were plentiful about the region. The fibre pre-treated with hīnau, when treated with the mud collected, resulted in a black with a slight hue of red. This result was interesting for me however, it was quite a common result for my contact who remarked “that is typical to see a slight tinge of red”.<sup>22</sup>

#### *Muriwai iwi Rongowhakataa, Nga Tāmanuhiri*

The request to attend a workshop at Muriwai Marae, also initiated a visit to the local mud site, once again located on the East Coast and approximately a kilometre away from the seashore (Figure 30). This region has a strong history of first encounters between Māori and

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<sup>22</sup> Margaret Ngarimu, personal communications with the author.

Europeans, as it was the first place that Captain James Cook arrived in October 1769 (Pope 2009). Māori were well settled here at the time of Cook's arrival having established a stronghold as descendants from the two waka *Takitimu* and *Horouta* that had arrived some years before from Hawaiki. The encounter between the two cultures began with intrigue but ended in bloodshed with Māori suffering fatalities from the mighty “thunderbolt” guns. Cook named the bay ‘Poverty Bay’ because he and his crew didn’t find anything they wanted (Pope 2009, 178).



Figure 30. Muriwai paru site with oxide film cover.

The mud site was a narrow stream that connected to other streams leading out to sea that appeared to be irrigated. The location was on flat pastures without any trees for some distance. The geological key reference describes the region as comprising beach sand, gravel, shell, and marine cover consisting of gravel, sand, mud, and peat (Edbrooke 2017). The stream had a distinctive surface covering of an orange and black marbled film, typical of an oxide formation (Figure 30).

At this visit, some weavers were collecting some mud for the dyeing of their piupiu. There was no karakia performed at the site and I assumed that was because prior to our visiting the paru site I was formally greeted with a welcoming pōwhiri and karakia to bless the day's events at the marae. The owner of the site informed us that for as long as she can remember, weavers have sourced their mud for dyeing from there. The collection of the



mud sample was readily accessible from the stream's edge using a shovel to dig into the black bed of the stream.

Waiwai, Tannin:

The weavers used a combination of mānuka and kānuka to tannin-treat their fibre, however this resource was not readily available. The hīnau-treated fibre tester had some of the mud collected applied and resulted in a black.

*Wainuioru iwi Ngāti Kahungunu*

In the region of Wainuioru- 'Big water from under'—southeast of the North Island township of Masterton, a Victorian estate established in 1853 occupies some 75,000 hectares of cleared rolling pastures. This property exhibits the impact of agricultural development, although in personal communications with the contact, he reported that the Māori landowners thought, at the time of the lease of the land in the mid-nineteenth century, that the land was too bare and lacked the resource of native forest, as told to me by Edward Betham the current owner.

The contact also mentioned that when his family first settled on the property Māori frequented a gully in the valley to dye their textiles black (black arrow in Figure 25) and named the area "Ngawaewae"—the trampling of many feet. This name may have some connection to the action of submerging the textiles into iron-rich mud, by trampling.

The contact, a fifth-generation resident of the estate, arranged for me to visit the homestead to assess the condition of his own Māori textile collection, as he was concerned about the degradation of the black fibres and the evident losses. This condition was obvious upon my initial examination but attributing partly to their condition was the way in which they were stored, that is, in too small non-archival containers and folded to make them fit.

The collection consisted of a variety of Māori textiles, cloaks adorned with feathers, black dyed thrums and kete. The contact believes that the black elements in the textiles may well have been dyed on the property. He added that cloaks were gifted to the family by local Māori particularly when there was a birth in his family, which would explain some of the small cloaks in the collection (Figure 31). In addition to the textiles were other taonga

including taiaha and waka huia (treasure boxes), that also required some stabilization or at least improved storage (Hedley 2012).



Figure 31. Small korowai originating from Brancepeth.



Figure 32. Aerial view of Brancepeth Station established in 1853.



Figure 33. Brancepeth homestead.



Figure 34. Kuia (elderly woman) client, kaikarakia (priest) kaumatua (elderly man).

When the work on the textile collection was complete, my contact agreed to contribute to the research project and take me to the area once frequented by Māori to dye their textiles black. The first informal visit to the paddock was made via a four-wheel-drive vehicle, a necessity to traverse the rolling hills some distance from the homestead (Figure 32). This visit was to scope the paddock and ideally find a site of iron-rich mud. The area situated at a gully between two steep grades had a gentle downward flowing stream that came from two natural springs. The springs seeped water and a rustic oxide film that settled on the sloping bare banks and lowlands of each outlet (Figure 36).

I observed, while tramping alongside the gentle flow of water and wet black mud, that no place appeared conducive to the dyeing of fibre, certainly not on a sloping decline. Eventually, what appeared to have all the conditions suitable for mud dyeing appeared in a secluded area, with a narrow flatbed of charcoal-black mud, raised sheltering side banks with shrubs and a metre-high cascade, possibly used to rinse the muddy black fibres (Figure 35). Based on my instinct and ethical responsibility the decision was made to return to the site and conduct a blessing with karakia before collecting a mud sample.



Figure 35. Brancepeth paru site.

The second visit was in the company of a kuia and a kaumātua (respected elderly Māori woman and man), a kaikarakia (a man who conducted incantations) and the contact (Figure 27). As elderly people were in attendance on the second visit, we approached the site from the lower flat area of the gully, which was easier for them to traverse.





Figure 36. Detail of oxide formation on wet land.

Approaching the mud site and trampling over the bog I also noted orange oxide in many places (Figure 36). The vegetation through the steep gully was not significant, but what was most apparent was the very tall kahikatea (*Dacrycarpus dacrydioides*) tree to the side of the mud site. The girth of the kahikatea measured 4.5 metres indicating that it was approximately 150 years old. The kahikatea prefers to grow in lowland swampy areas (Figure 37). Chapman-Taylor writes, “If they wanted a black dye, they had to soak their flax in the dark mud of the Kahikatea swamp, but then the colour would wash out unless the flax was next soaked in a fixer” (Chapman Taylor 1963, 29).



Figure 37. Kahikatea tree next to paru site.

As we approached the mud-site the kaikarakia began to recite a karakia, and I and the others followed close behind. It was not until I was ushered forward by him to carry out the collection of mud that I did so. While collecting the mud I observed the surroundings of the sheltered cove and pictured the activity that may have taken place there. A slightly raised platform dirt bank was there to stand or place items on and the cascade could be used to rinse the textiles of the iron-rich mud. The site was well protected by raised banks and the constant flow of spring water could contribute to its stability.

Waiwai, Tannin:

The contact was not familiar with what type of tannin was used to treat the *Phormium* fibres. I had observed that during the assessment of the textile collection the black fibres had a blue-black colouration, which is typical of the gallotannin, that is derived from either hīnau, pōkākā or tawhero.

*Okiwi iwi Rangitane, hapū Ngāti Kuia*

With a reasonable collection of mud samples from the North Island the challenge was then to collect some from the South Island. It became apparent that few weavers in the south

were active in the practice of dyeing *Phormium* black with the iron-tannate treatment. Inquiries made with known weavers in the South Island, as to where mud sites were, resulted in only one being able to provide information for mud collection. This was in the Nelson region at the top of the South Island.

The contact is a skilled weaver who was inspired to weave in the traditional manner used for a cloak of Nelson provenance held in Te Papa's collection<sup>23</sup> His knowledge, learned from his grandmother who held fast to traditional Māori practices, has inspired him as a young male weaver to replicate his ancestral kākahu and today is halfway toward completion.

He very generously drove me some fifty kilometres north of Nelson along the coast to Okiwi Bay. He was able to recite the history of the area, identifying historical pā sites and the settlement of both Māori and Europeans. Arriving at the shoreline of the most eastern part of the bay, we proceeded to walk over a ridge to a historical site, that was once a Māori settlement at an inlet (Figure 38).

Large orchards and gardens were once established along the banks of the inlet providing a healthy resource of food alongside a constant supply of seafood. We walked about the inlet and decided to dig into the mud rich with cockle shells on the very outer edge of the inlet (Figure 39). The mud was mainly light grey charcoal with fragments of shell.



Figure 38. An inlet at Okiwi Bay.

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<sup>23</sup> “Meet a Ngāti Kuia weaver,” *Te Karere* (Maori news TV One) 7 June 2021.





Figure 39. Collecting mud from a cockle bed.

Waiwai, Tannin:

The contact was most familiar with using tutu as a tannin source, although he was keen to employ the use of other tannins, as in some cases he was not able to procure a black-dyed fibre using the combination of local mud and tutu.

### Modern dyeing of muka

The collection of different iron-rich muds for modern dyeing of *Phormium*, covering a reasonable geographical representation was overall not as successful as the project would have wanted. As mentioned earlier, many factors are likely to have contributed to this, the main ones being the lack of activity in the practice of iron-tannate dyeing for black and environmental changes caused by agricultural practices. I have, however, been able to gather sufficient iron-rich muds and tannin samples to provide data that will identify dye recipes that colour *Phormium* black, as seen in traditional kākahu.

How was the material completed? At least two litres of each of the seven muds was contained in plastic food containers and stored in the fridge. They originate from Te Kuiti, Ahipara, Rotorua, Ruatoria, Muriwai, Wainuioru (in the North Island) and Okiwi (in the

South Island, Nelson region). A collection of tannins; hīnau, pōkākā, tawhero, mānuka, kānuka and tānekaha were sourced from the North Island with the tutu (*Coriaria arborea*) from the South Island. The barks of hīnau, pōkākā and tānekaha were bruised with the back of an axe whereas the branches and leaves of the tawhero and tutu were broken down, and the mānuka and kānuka bark strips were bundled before each was submerged into a stainless-steel pot of cold water to soak for two days. Further to this list, a combination of tannin treatments included mānuka and kānuka, and kānuka and tawhero, these paired combinations are familiar to weavers in Rotorua<sup>24</sup> and Taranaki,<sup>25</sup> respectively. A total of nine tannin treatments each in combination with seven muds, and sixty-three recipes for dyeing muka black were processed according to the methods outlined above.



Figure 40. Six of the seven mud fibre samples.

As seen in (Figure 40) the muka was treated with hīnau tannin and covered with six different muds and exposed to sunlight before being rinsed. The theory is that the natural iron ore within the mud used for dyeing, differs in elemental composition and when complexed with a type of waiwai, produces a certain hue of black in the dyed fibre.

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<sup>24</sup> Jim Shuster, personal communication with the author, 2017.

<sup>25</sup> Maata Wharehoka, personal communication with the author, 17 January 2017.

Magnetite and hematite are two of the most common natural iron ores found in sedimentary rocks or fresh water. Further to this, goethite is a natural iron ore although it has less iron oxide at 62.9% compared with magnetite ( $\text{Fe}^3\text{O}^4$ ) at 72.4% and hematite ( $\text{Fe}^2\text{O}^3$ ) at 69.9%. All with a higher percentage of 60 per cent these iron ores are considered natural and have economical value as extractable ore. One mention of the discovery of magnetite was during the time of Ancient Greece when the nails in the shoes of a shepherd, named Magnes, stuck to a rock rich in magnetite. This natural ore has a grey-black or brownish-black appearance. Hematite derives its name from the early Greek word for blood, and in crystal form resembles a deep red colour. This ore is also a natural pigmenting source. Goethite, a hydrated iron oxide, usually appears as red, orange yellow, black, or brown. Overall, the natural iron ores range in colour from dark grey through to bright yellow, or deep purple to rusty red.

Equally important are the mordanting agents of tannins, which may be typical or more abundant in a region because of its landform or climatic conditions. Tannins fall into two main categories—the gallotannis or hydrolysed tannins and the condensed tannins or non-hydrolysed tannins. Hydrolysed being the breaking of chemical bonds with the introduction of water. The performance of tannins in the process of complexing with the iron source of mud involves a series of complex chemical reactions, which will not be covered in detail here, but are the results of the complexing of these two agents when treating or dyeing *Phormium* fibre and then measuring the colour value of the dyed modern fibre. Several tannins known to have been used both traditionally and in modern times have been collected and processed in the traditional dyeing method with iron-rich muds.

### **Colour Measurements: What is your Black?**

The dyed fibres for colour measurements were dried fibres cut into small snippets and weighing 0.3 grams. Working with a hydraulic press the fibres were pressed into compact discs. Three discs were pressed for each dye recipe, and a total of 189 discs were made for colour measurements.

Colour is made up of three elements—lightness, hue, and saturation—and these elements can be measured, compared, and described quantitatively. The Konica Minolta Spectrophotometer  $L^*a^*b$  colour space values measure the blackness of the dyed fibre and

numerical figures indicate its colour space in relation to an 'L' value with 0 being white and 100 being black, its hue with red having an 'a' value of '+a' green hue, the 'b' value of 60 is yellow with '-b' value being blue.

The  $L^*a^*b^*$  values, set of three for each dye recipe, are compared to ascertain which recipe gave the darkest and lightest blacks, which recipe gave the best hue towards red or blue and how these can be compared to those black fibres seen in our pre-European contact cloaks held in collections abroad.

### **What does $L^*a^*b^*$ stand for?**

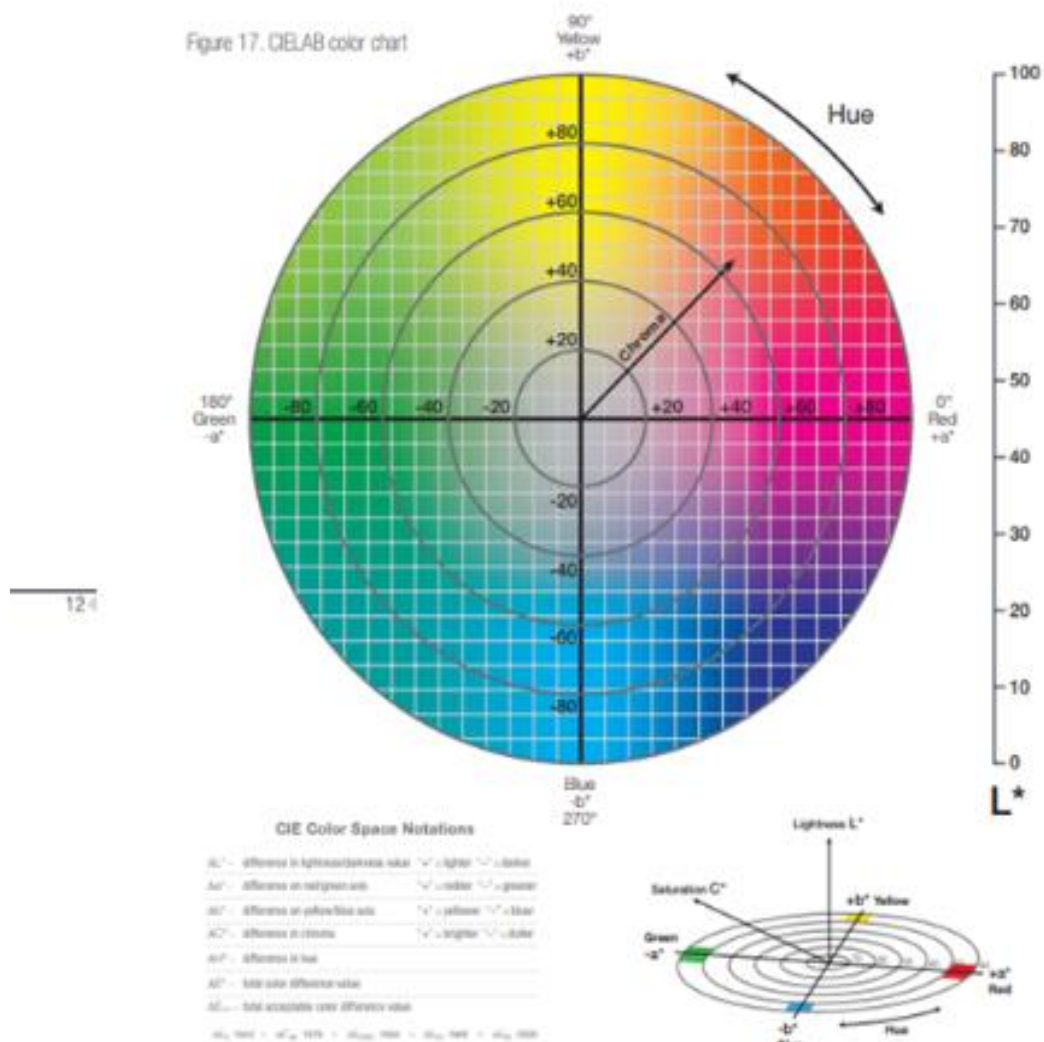
Regardless of which colour space name you call it, it's important to know what  $L^*$ ,  $a^*$ , and  $b^*$  stand for.

- $L^*$ : Lightness
- $a^*$ : Red/Green Value
- $b^*$ : Blue/Yellow Value

As an example, see Graphs 2 and 3, showing the colour-plotting diagrams for  $L^*a^*b^*$ .

- The  $a^*$  axis runs from left to right. A colour measurement movement in the +a direction depicts a shift toward red.
- Along the  $b^*$  axis, +b movement represents a shift toward yellow.
- The centre  $L^*$  axis shows  $L = 0$  (black or total absorption) at the bottom.
- At the centre of this plane is neutral or grey

Figure 17. CIELAB color chart



Graphs 2. and 3. Colour plotting.

<b>Tannin</b>	<b>Hīnau</b>			<b>Mānuka</b>			<b>Pōkākā</b>			<b>Tutu</b>			<b>Tawhero</b>		
<b>Mud-Fe</b>	<b>L</b>	<b>a</b>	<b>b</b>	<b>L</b>	<b>a</b>	<b>b</b>	<b>L</b>	<b>a</b>	<b>b</b>	<b>L</b>	<b>a</b>	<b>b</b>	<b>L</b>	<b>a</b>	<b>b</b>
<b>Ahipara</b>	30.70	0.80	-0.20	36.85	0.67	3.72	29.48	0.69	-0.56	43.75	1.17	-0.33	29.64	1.17	-0.59
	29.75	0.81	-0.47	35.8	0.68	4.15	31.91	0.70	0.30	46.30	1.23	-1.25	32.51	1.09	-0.04
	34.51	0.78	-0.91	38.29	0.74	4.41	31.78	0.78	0.04	33.59	0.95	-1.56	34.09	1.41	-0.07
<b>Rotorua</b>	37.44	1.05	0.52	42.62	1.00	5.61	40.68	0.68	1.45	40.81	1.10	2.39	39.37	1.57	-0.43
	36.77	0.95	0.42	41.87	0.97	5.69	40.40	0.76	1.33	39.36	1.55	2.92	38.83	1.52	-0.13
	37.05	1.07	0.50	42.27	0.86	5.35	39.10	0.73	1.19	40.31	1.31	2.61	38.22	1.62	-0.11
<b>Te Kuiti</b>	27.90	-0.75	-1.24	36.06	0.60	3.27	28.34	0.78	-1.26	30.46	0.77	-0.55	28.58	0.97	-1.39
	27.14	-0.73	-1.12	35.51	0.52	2.93	28.86	0.79	-1.24	30.64	0.70	-0.63	28.42	0.94	-1.58
	27.87	-0.75	-1.09	34.97	0.53	2.78	29.43	0.81	-1.16	29.08	0.69	-0.60	28.81	0.85	-1.63
<b>Muriwai</b>	30.73	1.08	-0.49	38.56	1.11	4.24	32.16	0.93	-0.81	31.17	0.87	-0.10	32.02	1.04	-1.00
	30.81	1.07	-0.63	36.81	0.86	3.46	33.64	1.04	-0.48	31.87	0.88	-0.01	31.12	1.16	-1.19
	30.84	1.14	-0.71	35.10	0.86	3.25	31.34	0.98	-0.83	32.19	0.94	-0.29	32.83	1.26	-0.67
<b>Wainuioru</b>	34.07	0.96	-0.45	42.47	0.78	4.31	34.24	0.79	-0.69	35.29	0.80	0.63	34.47	1.20	-0.47
	36.56	0.99	-0.14	41.59	0.80	4.71	33.26	0.80	-0.69	36.82	0.89	1.15	33.19	1.19	-0.80
	35.01	0.95	-0.21	42.01	0.77	4.67	33.55	0.75	-0.61	35.82	0.88	0.99	34.66	1.13	-0.87
<b>Ruatoria</b>	34.34	3.26	3.97	31.70	3.26	1.61	32.90	2.59	1.89	34.68	2.98	3.03	31.60	3.09	2.01
	31.89	2.49	1.46	39.58	2.04	5.71	33.74	2.81	2.25	32.82	2.77	2.01	32.32	3.01	1.63
	31.11	2.72	2.18	38.41	2.05	5.35	33.44	2.82	2.32	34.88	3.17	3.25	32.56	3.57	2.21
<b>Okiwi</b>	32.73	1.64	1.77				30.74	1.95	1.27	41.14	1.74	+ 6.55	31.82	2.16	2.71
	32.50	1.57	1.72				31.62	1.99	1.50	43.21	1.98	+ 7.30	31.01	2.07	2.32
	32.49	1.46	1.67				31.02	2.17	1.36	40.98	1.75	+ 6.97	32.48	2.10	2.66

Table 1. Colour values.

<b>Tannin</b>	<b>Kānuka</b>			<b>Kānuka/Tawhero</b>			<b>Mānuka/Kānuka</b>			<b>Tānekaha</b>		
<b>Mud-Fe</b>	<b>L</b>	<b>a</b>	<b>b</b>	<b>L</b>	<b>a</b>	<b>b</b>	<b>L</b>	<b>a</b>	<b>b</b>	<b>L</b>	<b>a</b>	<b>b</b>
<b>Ahipara</b>	32.35	0.59	2.68	32.13	0.49	0.70	31.13	0.40	1.44	35.10	5.36	6.86
	35.26	0.67	3.26	32.52	0.48	0.90	31.64	0.52	1.33	35.50	5.71	7.40
	39.92	0.78	0.62	30.24	0.57	0.44	30.69	0.49	1.51	34.33	5.70	7.05
<b>Rotorua</b>	45.09	1.05	+ 6.11	44.96	1.16	5.73	42.04	1.51	6.78	37.44	7.71	10.05
	44.49	1.10	+ 6.11	43.71	1.22	5.26	43.55	1.77	8.38	36.74	7.75	9.89
	45.70	1.27	+6.69	43.63	1.40	4.86	41.41	1.72	8.18	36.30	7.71	9.51
<b>Te Kuiti</b>	32.67	0.78	1.78	32.72	0.77	1.84	30.38	0.63	0.90	30.67	2.81	3.15
	33.82	0.82	1.70	32.40	0.74	1.66	31.10	0.60	0.88	30.95	2.33	3.97
	31.69	0.73	1.28	31.87	0.66	1.02	31.81	0.53	1.61	31.48	2.61	3.34
<b>Muriwai</b>	34.77	0.25	1.80	32.09	0.30	-0.05	33.12	0.21	0.96	36.22	5.00	8.42
	36.36	0.15	2.46	32.52	0.25	0.14	32.56	0.21	1.20	35.05	5.15	7.63
	34.74	0.23	2.07	32.39	0.28	0.15	33.52	0.21	1.37	35.66	4.63	8.86
<b>Wainuioru</b>	35.88	0.61	2.77	34.98	1.25	2.62	34.15	0.60	1.78	31.97	3.87	4.72
	36.39	0.62	2.80	34.51	1.27	2.01	36.32	0.56	3.38	32.78	3.86	4.70
	36.97	0.65	3.01	35.06	1.09	2.83	33.81	0.69	1.92	32.28	3.87	4.74
<b>Ruatoria</b>	38.31	2.17	6.53	31.57	2.37	3.10	34.96	2.40	4.46	30.91	4.68	3.75
	34.73	2.22	4.41	32.69	2.35	3.75	34.48	2.50	3.97	31.67	4.62	3.69
	34.70	2.26	5.18	33.27	2.04	3.62	33.35	2.30	3.71	31.69	5.08	3.72
<b>Okiwi</b>										34.80	7.65	5.94
										34.52	7.90	6.11
										34.61	7.74	6.19

Table 2. Colour values.

## Results of the colour analysis

The darkest fibre dyed was the one treated with the tannin from hīnau bark and the iron containing paru mud collected from Te Kuiti with CIE L\*, a\*, b\*, colour spaces recording the lowest 'L' values of 27.90, 27.14, 28.34 indicating that this value was closest to pure black (a value of '0' and pure white being '100'). Similar values were measured for Te Kuiti paru and tannins pōkākā and tawhero with 'L' values 28.34, 28.86, 29.43 and 28.58, 28.42, 28.81 respectively. The 'a' value for all three tannins combined with the Te Kuiti paru ranged from -0.73 to -0.97 indicating a greener hue colour space of '+100 60' for red as shown in the diagram. As it was for the 'b' values ranging from -1.24 to -1.63 indicating a blue hue shown in the colour diagram. Overall, all the tannins each combined with the Te Kuiti mud recorded the lowest 'L' values ranging from 27.14 to 36.06, the latter combined with the mānuka tannin. The hīnau, pōkākā and tawhero tannins also performed similarly with the Wainuioru mud with 'b' values ranging from -0.14 to -0.87, with a slightly blue hue. From this, we can infer that the tannins hīnau, pōkākā, and tawhero are of the Gallo tannins type that exhibit a blue-black hue. These results also indicate that the Te Kuiti mud is a good source of iron.

The palest of the dye recipes was that of the Rotorua mud and the kānuka tannin with 'L' values 45.09, 44.49 and 45.70-(100 is whiter). The 'b' values for this recipe ranged from +6.11 to +6.69; however, the combination for Rotorua mud with kānuka and mānuka gave the highest 'b' values for all combinations ranging from +6.78 to +8.38. The other pale dye recipe was that of Okiwi mud and tutu tannin with 'L' values ranging from 40.98 to 43.21 and 'b' values ranging from +6.55 to +7.30.

The tannins kānuka, mānuka and tutu, appear to perform much the same, characteristic of a condensed tannin resulting in pale black of a green hue. All tannins except that of the tānekaha, combined with the Ruatoria mud, gave similar values with minor changes between the Gallo tannins extracted from hīnau, pōkākā, and tawhero to that of the condensed tannins; extracted from mānuka, kānuka and tutu. Values of these combinations ranged from 31.11 to 39.58 for the 'L' values, 'a' value ranging from 2.04 to 3.57 and 'b' values ranging from 1.46 to 4.46.



The tānekaha tannin gave high ‘a’ value for all combinations with mud ranging from 2.33 to 7.90. The most obvious combination was that of Okiwi and tānekaha with ‘L’ values ranging from 34.52 to 34.80 and ‘a’ value ranging from 7.74 to 7.90 and ‘b’ values ranging from 5.94 to 6.19. These values give red/blue-purple hue (Table 2).

### **Iron-mud efficacy**

Visual examination of all dyed samples readily identified colour differences particularly those of the darkest and palest blacks and those with a red hue. The most interesting was that of the Ruatoria and Okiwi muds in combination with tānekaha tannins. The Ruatoria mud gave a consistent red hue for all dye recipes. To understand this phenomenon the mud-dyeing work of O’Connor in West Surrey, East Hampshire, England is also reviewed here. The location studied in West Surrey has a high ion sulphide content, iron pyrite ( $\text{FeS}_2$ ). In the presence of bacteria, the microbial activity can catalyze the oxidation of pyrite to release soluble ferrous ions in an acidic solution ( $\text{H}_2\text{SO}_4$ ) that can be absorbed by the fibre presented for dyeing. O’Connor reports that a variation of tannins used with the iron pyrite mud produces colour variation from a grey to a reddish-brown hue (O’Connor 2002). The colouration can be affected by the nature of the mud ion pyrite being oxidised to release ferrous ions by microbes or bacteria in acidic conditions. The reddish hue in all the Ruatoria samples may be attributed to the general location of the paru site in Raukumara Peninsula where iron oxides have been detected in stream beds (Black 1980). When visiting the site, it was observed that the cows had trampled the edge of the paru site and it smelt like there was cow waste present.

A preliminary test of hīnau-treated fibre was submerged in the Ruatoria mud and left overnight. The red hue in the fibre resulting from the dye test was familiar to the client and the response was “that is typical of our paru black”. This red black is not common in Māori cloak collections, however, one that exhibits this is in the Auckland War Memorial Museum (ID 632272, 3211), and is of Coromandel provenance. The combination of tānekaha and the Ruatoria mud gave the highest “a” value of 5.08 for all its dye recipes although higher with a value of 7.90 was that of tānekaha and Okiwi mud. The Okiwi paru mud reacted best with the tannin from tānekaha, giving a red purple initially, however, fading to a red brown (Figure 41).



Figure 41. Okiwi tanekaha- and paru-treated muka.

The tānekaha tannin is a condensed tannin and was used for procuring a red-brown-coloured fibre by rubbing the wet dyed fibre into warm wood ash that is a strong alkali based on potassium. In this case, the wood ash is replaced with the Okiwi mud of rich calcium carbonate derived from the cockle shell bed. This basic environment converts polyphenolics to red anthocyanidin products (O'Connor 2002). Unlike the other condensed tannins, mānuka, kānuka and tutu, the tānekaha complexes well with Okiwi mud and the results are almost unique. The red-purple-coloured fibre of similar hue is seen in an eighteenth-century kaitaka held at the Hunterian Museum in Glasgow (Figure 42). This cloak also exhibits a contrasting blue-black and a noticeably light grey-coloured fibre.

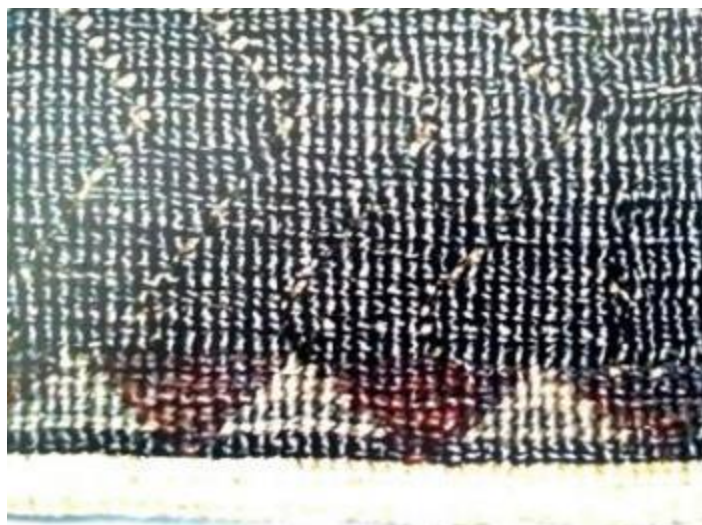


Figure 42. Detail of a kaitaka held in the Hunterian Museum, Glasgow (Registration E616).

The tutu and Okiwi combination gave a high 'L' value of 41.14 that corresponds to a lighter-coloured fibre. Further to this, the combination of hīnau and Okiwi gave a more intense black. The properties of the Okiwi mud produced the most notable variations of dyed muka depending on what the tannin combination, from a light grey, black to purple-red and fading to a red brown. This feature is not common in Māori textile collections held in Aotearoa and certainly not all in the one cloak. It may well have been the result of early contact between Europeans and Māori in the upper South Island with an exchange of items. An example of one such encounter is the one, also noted above, which took place in the late eighteenth century at Moutara Island between Cook and "New Zealanders" (Māori), with the exchange of fish, war weapons and 'cloaths' for nails and old bottles (Beaglehole 1925).

## Conclusion

It was, indeed, a privilege to work with tangata whenua visiting their paru sites. The experience shared with them, be it with an individual or group, was enlightening and mana enhancing. Taking an excursion to the place that held the mana and significance of its people and being given the historical content of the location was an honour. I felt that I could walk with them along the paths once taken by their ancestors. For this reason, on occasion, tikanga was observed and a karakia given to bless those partaking in the activity and to recognize the whenua. This encounter or participation provides a feeling of connection. I was pleased that the contacts were happy to share their information about the site because they were interested in the objective for collecting the mud samples and being part of a kaupapa that was rich in their material culture.

Through the course of engaging with tangata whenua in the field work it became apparent that the locations of paru sites had similar landscape features. It is possible to search a landscape for sources of water along which path could lead to an historical settlement. Names of marae or pā settlements and place names that surround the marae with notable landmarks such as, hills, mountains, rivers, and the lowland swamps can help identify paru sites.

The stratigraphy of landforms is provided with various technical maps. A wealth of information is accessible to any member who is interested in the make-up of their land and furthermore what attributes to the soil condition, the latter being of particular interest to early Māori, to produce crops. In this study the black dyeing of *Phormium tenax* fibres, muka, relates to a unique chemistry in the iron-containing paru that gives a signature black colour in combination with the waiwai-tannin resource associated with a specific locality. The activity or practices of tangata whenua are relative to their whenua and this can lead to taonga crafted during their settlement.

The collection of paru samples was in the main successful. Of the eleven sites visited seven paru samples produced a black-dyed fibre. The black fibres did reveal some notable differences in their hues of blackness. This outcome will support further research to identify which plants for tannins and which properties of the iron-rich muds, either acidic or

alkaline, exist in each region today. The acidity or alkalinity of the mud can influence the stability of the dyed fibre and could support the practitioner's choice and, indeed, museum conservation and/or curatorial research.

The research did identify paru sites that were recognized for their history but, unfortunately, their health had been compromised over time. One site visited had been recognized for its activity for dyeing Māori textiles black and had a monument describing its use and those who used it (Figure 43), and a pou (wooden carving) erected as a kaitiaki (guardian) (Figure 44). The site can be visited today by the public because it is in the hub of Whakatāne township, a five-minute walk from the urban shopping centre. Urban development surrounding the site has seen land changes with engineering for irrigation and walkways that have altered the water flow from the nearby seashore. This development, unfortunately, has, I believe, destroyed the once valuable iron-rich mud resource. Paru mud samples collected from this site and tested with the tannin-treated fibre showed no black colouration, only a light grey stain.



Figure 43. He Mātāpuna paru (the paru source) monument, Whakatāne.



Figure 44. Parau site with pou.

Known parau sites should be made available to tangata whenua and certainly to traditional dyers who would like to source an iron-rich mud. A relationship should be developed between the practitioner and the landowner of the site and from this a maintenance plan could be implemented. The site could become a place of cultural heritage and its 'health' treated accordingly. Maintenance of the site would take into consideration the surrounding elements such as water flow and stock and/or human impact. The care of the parau site would adhere to the values of Te Taiao. I advocate that in the interests of the continued practice of dyeing black Māori textiles with iron-rich mud, parau sites should be recognised as part of wāhi tūpuna with Heritage Aotearoa, and a care programme be put in place by the landowner, tangata whenua and/or practitioners.

The results of sourcing tannins during the research were not plentiful and in places were non-existent. It would be a logical and practical measure to develop a source of plants that were typical to a region to be grown and again made available to tangata whenua and traditional dyers. The tannins that were used for the research could be sourced for the establishment of a plantation perhaps grown next to, or near, a parau site.

The recognition and restoration of both parau sites and their respective sources of tannins, would be an ethical and cultural means of preserving mātauranga. In every aspect of this restorative practice Te Ao Māori is fundamental. The connectivity to Te Taiao and the whenua while developing and maintaining human relationships would support well-being

(Geismar, H. 2013). It most definitely would enhance and, in most cases, improve the environment, including better water flow and the restoration of wetlands. Deploying these practices might also lead to further research to add to a knowledge base of mātauranga and to add to the knowledge of conserving taonga kākahu, held in homes and in museum collections.

The research identified some unique hues of black-dyed fibres, which appear like those seen in taonga kākahu, housed in museums abroad and not known to tangata whenua. A responsible course to ensure the preservation of mātauranga would be to support the practice of dyeing fibres black and to research the technology in taonga kākahu that may have application in our modern world and, importantly, would help to retain identity.





## **Chapter four:**

### **Weave it to know it:**

### **Analysis of taonga kākahu**

#### **Introduction**

I have often heard an enthusiastic weaver say, while working with harakeke, that from the time they have learnt how to fashion it they find the craft therapeutic and almost addictive. The weaver of traditional times however was likely to have had a different approach to the craft of fashioning items made from harakeke. Supervised by an elder weaver or tohunga, the weaver would have demonstrated the right attitude and aptitude for the tasks at hand (Best 1898, 627). The procurement and preparation of materials would have been an organized set of processes, which adhered to the protocols of Māori culture. The availability of plant materials and the processing of them was relative to the nuances of a people treading new lands. The mātauranga retained in the manufacture of such taonga identify the practice and identity of a people. The weaving domain, Te Whare Pora, connects Māori to whakapapa and maintains a sustainable way of life.

The previous chapter set about identifying some of the processes or recipes for dyeing the muka black, which would have been employed in traditional times. The properties of plant materials for tannins and the locations for sourcing the iron-rich mud, not only supported the mātauranga of Te Whare Pora but provided connection for tangata whenua. From that practical exercise, this chapter moves on to apply the dyeing processes to obtain black fibres for the construction of detailed work mimicking some traditional Māori weaving. As a weaver the proposed work was challenging, however, from a Māori view it was fulfilling, and then from a conservator's perspective, informative. This chapter looks closely at pre- and contact European kākahu and attempts to replicate the processed elements in two rāpaki and a woven portion of the pauku. In this exercise the processing methods and weaving are described to provide traditional weavers or practitioners with a means of reproducing the taonga and in doing so to reconnect to the mātauranga of these taonga kākahu.

Three incredibly special taonga kākahu have been selected to be copied for their technical aspects. Only a small portion of each taonga has been replicated. Two of the taonga, both rāpaki, are stored at Te Papa in the Whare Pora Hineaniwaniwa storeroom. Each of them has a significant amount of dyed black fibre, one exhibits all black elements and the other has a heavy outer cover of fine cylindrical pōkinikini that has black fibrous sections. The third taonga is stored at Durham University Museum in the United Kingdom and is a fine example of pre-contact taonga.

All three of the case studies are considered very fragile with continual fragmentation of the dyed black fibre. A technical description is presented in this chapter and an interpretation of the narrative in the woven work is also described. In terms of the methodology employed in this analysis, (and as I explained in the introduction of this thesis), a description of each textile includes the material processing, construction and design, condition, and proposed stabilization. The last section of the chapter discusses the significance of this knowledge in terms of how it is related to the nuances of early Māori culture. In this exercise the objective is to explore and expose the theory of weaving taonga as a means of reconnecting to the mātauranga of Te Ao Māori.

Museums in Aotearoa and, notably, museums abroad hold in their collection stores examples of traditional Māori weaving that are testament to the technology and craftsmanship employed by Māori. Identification of materials, processing and fabrication, and close visual analysis of design, can provide a technical guide to understanding and reconstructing weaving and, thus an opportunity to walk the paths once taken by tūpuna in making taonga kākahu. This path, or ara, draws knowledge from Te Ao Māori in the hands of the weaver, wāhine Māori and a conservator who is the author of this study—ko au tēnei. My whakapapa will be a supporting tool to extrapolate and interpret the taonga presented here.

## Analysis of taonga kākahu in museum collections

### 1. The Te Papa rāpaki (ME2086)

The rāpaki can be a waist garment or cape. Its construction is less complicated than the kākahu, which may suggest it was one of the first garments to be fashioned upon arrival. Early European descriptions of Māori clothing included a ‘thatched’ type waist garment or cape (Roth 1979, 46). The waist garment was also typical for other Pacific cultures and, indeed, today some of these remain part of the customary costume. The twined cape is also evident in cultures of the northern hemisphere. Examples displayed in Austria at the Vienna National Museum, dating from the time of early European civilizations, appear similar in construction to that of the pākē, or thatched mantle in Māori weaving.

The dress of the ancestors of Māori in their former homeland in the Pacific was very much a garment wrapped around the waist fashioned from tapa of the mulberry bark, or ‘aute’ in te reo Māori, more suited to a warmer climate. The unsuitable climate conditions for growing mulberry in their newfound land, Aotearoa, and the adaptation of harakeke to readily cover the lower half of the body as a waist garment, is evident in the rāpaki.

The woven foundation, from which hang free lengths of dressed harakeke, provides coverage and allows movement. The rāpaki has a fibrous foundation with weft rows enough to cover the lower abdomen. Pōkinikini are woven into the weft rows and hang free to the hemline, allowing ease of stride. It was noted by early Europeans for its practicality particularly during warfare. The lengths of the rāpaki allowed the wearer to run freely, and the waxen surface repelled the water. When it did get wet, it would be dried readily by an open fire. When on the side of kūpapa—Māori who fought with Europeans—soldiers of the British constabulary adopted the rāpaki as an alternative to trousers. Trousers were restrictive when wet, they were heavy not allowing mobility in warfare, and they took much longer to dry.

The rāpaki at Te Papa (ME2086) is impressive on the initial examination, thousands of small black fibrous sections of thin leaf cylindrical lengths appear as a wavering of black specks in motion (Figures 45 and 46). The waistband is all black, with upper and hemline borders worked only in untreated, or non-fibrous, leaf.



Figure 45. Rāpaki overall view.



Figure 46. Detail of rāpaki.

The rāpaki measures 1300 mm at the waist—a considerable size to wrap the waist—is 680 mm long and weighs about three kilograms. Hundreds of thin pōkinikini lengths differ in the pattern. The pattern changes between layers of pōkinikini woven into alternating weft rows, that make up the thick outer mass. The preparation of the pōkinikini for this rāpaki appears to be extensive. Traditionally, however, with no distractions and more concentrated efforts, the results in the beautiful work are indicative of the creator's concentration and execution. Thousands of thin pōkinikini lengths differ in dimensional pattern changes between layers woven into alternating weft rows.

#### *Materials Processing*

The selection of the type of material is critical in achieving the desired outcome. The rāpaki made of strips of processed harakeke features dyed black sections, pōkinikini, that collectively make up a pattern. In this instance, what is of interest is the colour of the blade once processed and aged and the narrow sections ready for dyeing. The processed, aged leaf can range from a deep honey-colour to a light almost whitish-yellow shade, the latter gives excellent contrast to the black sections seen in the rāpaki.

The lengths of the uppermost pōkinikini, those most visible, have, on average, 120 black sections this would equate to 240 incisions made on the dull side. For this reason, a broad strip is worked and striped into narrower strips. It could also be possible to expose the fibres with just a firm pressure and scraping of the leaf with the straight edge of the shell. In this case, a concentrated effort to scrap the blade at regular intervals results in the uniformity of spacing between black fibrous sections. The skill of work also executed for the lengths that have a broader and consistent spacing, is essential. The rāpaki in the Te Papa collection has pōkinikini of three main patterns worked—the spacing of three to four, four to five and six to eight millimetres.

Making piupiu requires an incision, or whakapā, about half the depth of the leaf, on the underside, or dull side. Two cuts on the underside assist with the exposure of fibres and release of green matter between cuts when processed with a mussel shell on the upper side.

### *Replicating Pōkinikini*

For the sample replica of the rāpaki pōkinikini, local varieties—ngutunui, taeore and an unknown variety—were available. Ngutunui produces clean fibres with little epidermal matter, readily extracted with a mussel shell, immediately after being harvested. Its blade is notably wider than taeore and has a reddish edge, whereas taeore has black trim and is much narrower. The unknown harakeke also has a reddish edge and is not as broad as ngutunui. A wild variety of harakeke was harvested and stripped approximately two centimetres wide.

Close examination of the dyed black sections in the rāpaki reveal that few fibres are exposed. The breaking of the waxy surface is enough to dye the underlying fibres. Preferably, the straight edge of a natural mussel shell, which is stronger than a cultivated one, is placed on the shiny side or upper epidermis immediately above a shallow incision made on the underside with the sharp edge of a mussel shell, not a knife-edge of steel which is used in modern times. With the shell held tight in the right hand and remaining stationary, the leaf caught in the left hand pulls up from the shell's edge in a quick action, enough to break the cutin, or para, the waxen surface. The constant regular action of scraping or pinching the leaf strip is translated to kinikini and the black to pō (of the night) dyed sections, hence pokinikini.

The lengths that are outermost are the longest, measuring approximately 670 mm long. These lengths have black sections about three to four millimetres apart (Figure 47) with a 30 mm end that has no scrapings. An approximate 120 scrapings or black parts appear on each. There is uniformity in the pattern when three to four lengths are adjacent suggests that one width with the same design striped into a number. A width of 2 cm split into four, will result in a 2 mm diameter when processed—boiled and dyed. Notably, the underlying lengths have a wider spacing between black sections, these range from four to five millimetres apart and those most underneath along the first weft row spacing of six to eight millimetres apart.



Figure 47. Detail of Pokinikini; old (left) and modern (right).

The strips that make up the uppermost layer have a non-fibrous leaf section at the top and bottom, about 40 mm which forms a decorative border trim. Past the upper border trim is a fibre length approximately 150 mm long, woven into the waistband. The underlying lengths all have the lower border trim only and fibrous top incorporated into the series of weft rows.

The fibrous sections contribute not only to the overall aesthetics of the rāpaki but allow each of the lengths to be woven into the foundation. The preparation of the lengths, of which there are thousands, would require more work than the actual weaving or fabrication. The weaver would have to trial a variety of harakeke, to decide which would react best to the dyeing and the boiling of lengths to achieve a tight curl in its processed state. In this exercise the weaver becomes accustomed to the properties of their resources.

### *Boiling*

The dressed leaf lengths are boiled for about half an hour to encourage the contraction or curling up of the leaf strip when drying. Before being left to dry the leaf is stripped into narrower strips. Two to three days left drying ensures that the lengths contract and curl up tight.

### *Dyeing*

The dyeing black of the small fibrous sections on the hundreds of narrow curled up lengths is the making of pōkinikini for the rāpaki. Soaked in hīnau tannin solution overnight and hung to dry before being submerged into an iron-rich mud, paru/repo, they remain submerged overnight. A thorough rinsing removes particulate matter, and the fibres are dyed black once exposed to air.

### *Weaving the rāpaki*

Aho preparation: The prepared pōkinikini are woven together with muka extracted from the leaf using a mussel shell. The obtained fibres are coarser at the lower end of the blade and taper thinner to the top. Even thickness is achieved when the fibres are separated into two—the top end of one half taken to the lower half of the other. The collective of fibres is then halved and plied over the thigh to develop tightly woven lengths of aho. The weft, aho threads are of reasonable coarseness, approximately 1mm thick.

The kaupapa: The weaving began at the lower part of the garment and worked up toward the waistline. The pōkinikini, with the leaf and black sections away from the weaver, are woven in the first aho stitch and continue to make the lowest weft row using the weaving technique of double pair twining—whatu aho rua. The first woven row whatu twines two or three lengths in each weft stitch, not at any time is a single pōkinikini woven, on average, three to four weft stitches to each centimetre. The aho of the first weft row appear thicker and the plied twist to be tighter, than those that follow. This method of weaving adds body or volume to the foundation, or kaupapa.

The first row of pōkinkini has the least amount of leaf matter and the longest black fibre, approximately 50 mm, the latter woven into the other weft rows that follow and finally the waistband—the black threads in each length woven into the weft rows. The leaf matter has

fibrous black sections that are further apart than others. Another twenty-one weft rows build the foundation and layered patterns of the black-dressed lengths. The foundation, or kaupapa serves as a part garment with weft rows creating a woven cover for the lower abdomen.

A first weft row worked in double pair twining joins hundreds of prepared lengths. Alternate weft rows weave in more pōkinikini which are spaced by two or four stitches. The weft rows have a spacing of about 2 cm. The eighteenth row starts with the first seven stitches worked immediately above the previous row then gradually spaces above that row to 2 cm. It continues then tapers back onto the last row with the last several stitches woven directly above those of the previous row. The inclusion of a tapered row is referred to as aho poka, a shaping row which provides volume. Four more weft rows complete the making of the kaupapa.

Waistband: A length of dyed black muka fibres not plied into aho weaves the fibrous ends of an estimated 1500 pōkinikini. A single pair twining, or whatu aho tahi, is worked in six rows. The top edge has a rolled edge.

### *Design*

The construction is basic weaving employing only twining in single and double wefts, the preparation, however, is more involved and requires a skilled hand to produce distinctive elements. The intriguing layering of pōkinikini with varied small, black fibre sections contrasting with the pale leaf parts makes for an impressive visual movement, even when it is lying still.

When worn, the rāpaki would have displayed a thousand or more black sections moving about, an eye-catching feature. My interpretation of this visual feature, as previously described, is that it represents a tremulous collective of peaks as one would see on the vast sea. The description aligns with the experience of our tūpuna having spent long periods on the sea during their epic voyages across the Pacific, in their quest to discover new lands and indeed the world. The name Moananui a Kiwa is translated to the deep dark—Kiwa, big sea—Moananui. For Māori, as for all Pacific Islanders, ocean voyaging was part of their culture in centuries past. Understandably the surroundings or natural environment can



influence the creator's intent, and here, in my view, we can see a clear connection to the visual design of the rāpaki.

### *Condition*

The rāpaki appears whole and stable overall. It is, though, on close examination, in poor condition as there is a continual loss of black fibres. Of the hundreds of pōkinikini that make up the kilt, there are hundreds detached because of breaking black thread. The detached lengths contained in a large sample bag lay next to the rāpaki. Further to the acidic degrading effect of the iron-tannate black dye, the actual make-up of the individual lengths, or pōkinikini, comprising both leaf and black fibres, further stress at the point where leaf becomes fibre, contributes to detachment. The strength of the leaf section has no flexibility against the fragile black sections, and this condition is typical of waist garments such as piupiu. The leaf sections of the outermost pōkinikini appear lighter than those underlying, typical of aged plant matter of this type.

### *Conservation*

To prevent the lengths from becoming detached from the foundation of the rāpaki, consolidation treatment is necessary. The lengths are both leaf and black fibrous sections and ideally only the fibrous sections should be treated, this however is impractical as each length would be subject to movement for localized treatment, and because there are thousands of black sections it would take an extremely long time. The approach to stabilize the lengths would require a complete coverage of consolidation, leaf, and black fibres.

For this treatment I would propose that the lengths be separated into their layers beginning with the lower or under row. The challenge would be to separate the layers and keep them separate until the consolidation treatment is dried which would take at least eight hours. Once the layers were treated and the overall face of the rāpaki was consolidated and stabilized it could be carefully turned over to treat the reverse. Minimal movement would prevent fragmentation therefore this treatment requires a once-only approach.

To maintain or eliminate movement after consolidation, a support system can be designed to keep the rāpaki stationary. Three options have been successful in eliminating movement, one method has been to surround the waist garment either in part or full, removing space for

elements to move into, or placing the waist garment in a recessed surround. This surround method does eliminate movement, however, in this case with the volume of this rāpaki with its many layers of varied exquisitely crafted pōkinikini, the surround would compromise this special feature. Alternatively, the positioning of T pins, covered with Japanese tissue dyed to match that of the leaf sections, could be placed at numerous points around the rāpaki, and even through the foundation carefully positioned between the whenu.

The conservation treatment is directed toward arresting black fibre deterioration and providing a support system that eliminates or prevents movement. In this case, the intervention is permanent and therefore considers the parameters necessary for both storage and display. Employing this method of support to prevent movement is in opposition to the intent of the performing pōkinikini that are fashioned in a way to show movement.

For the modern weaver, considerations may be taken to trial various sources of iron-rich mud to colour the fibrous sections black with either a post-treatment of Waiwai, or tannin, described in chapter two or by sourcing an alkaline mud, like that of the Okiwi mud described in chapter three.

### *Storage*

The rāpaki at Te Papa is stored flat on a support archival foam board. The support board is a Micro-chamber board. The board is made up of one hundred per cent cotton rag, free of lignin and sulphur and has zeolites—molecular traps that absorb acidic vapours. The rāpaki stored in an enclosed metal drawer can trap acidic off-gassing from the rāpaki, the board will assist in absorbing some of those damaging vapours.

### *Display*

It is possible to display the rāpaki with specific parameters adhered to. Because of the fragility of the black fibres, a flat display angle should not exceed 45 degrees. To keep it still and not subject to any movement, the use of T pins—described under conservation above—can secure the rāpaki to its support. Light levels should not exceed 50 lux and/or be controlled by sensory lighting. Ideally the display time should not exceed three months however sensory lighting could allow a display time of up to six months. The accompanying text should provide some technical notes regarding the numerous black

sections, and their making and the pōkinikini should be slightly parted to show the layers of lengths.

### **Attempted replica of pōkinikini on rāpaki**

Initial examination of the pōkinikini noted the very thin, tightly-curled lengths and regular spacing of the black sections. After much experimentation, the results indicate further practical trials are required to match the pōkinikini of the rāpaki at Te Papa (ME2086). The execution of the process of removing the waxen epidermal matter to allow for dye penetration depended on the amount of pressure applied with the mussel shell edge on the upper side of the leaf strip along only one incision line made on the underside. I found that a short, controlled pressure at regular intervals, only millimetres apart, could achieve the result. The results of this work were varied, with some pōkinikini showing dye bleed, different widths of black sections and degree of the finished curl. The pōkinikini of this work are notably thicker than those of the rāpaki at Te Papa.

## **2. The black rāpaki at Te Papa (ME2085)**

Another rāpaki in Te Papa's collection (ME2085) appears to be of the same period and its construction features no leaf material but only dyed black fibre (Figure 48). Instead of the pōkinikini, the lengths that hang from the weft rows and the waistband are plied miro. The garment features hundreds of plied black lengths. All the plied lengths have maintained their degree of tight twist, without any unravelling, after at least one hundred and fifty years.



Figure 48. Rāpaki ME2085.

### *Preparation*

Hundreds of strips of harakeke have had muka extracted and dyed black. The uniform coarseness of the lengths is achieved by ‘top and tailing’ the muka. The fibres are plied immediately after extraction from the leaf and while still moist; this assists in maintaining the tight twist. The top and tailed fibres are equally separated or halved, and each half is rolled in the same direction over the thigh with a firm downward action under the palm. The plied threads are then pinched together where the plying ends, and self-twist upon themselves. This plying technique forms a tight twist and is worked in segments down the length. The plying miro is slightly varied—the ‘Z’ twist angle of the miro ranges from thirty to fifty degrees and from 1.5–2 mm apart. They range from 30–600 mm long and are knotted at the end.

### *Construction*

The construction of this rāpaki (ME2085) is like the one discussed above. Like the pōkinikini, the miro lengths require a leaf type with good fibre content and measured width. The weaving of the weft rows also begins at the lower part and is a total of eighteen rows, including one shaping row, the aho poka. Black weft threads worked in double pair twining, or whatu aho rua, weave the black lengths together. Each of the first two weft rows has two

rows, or whatu, close together. The waistband is plaited together and tapered off to tie lengths.

### *Replication of miro lengths*

The harakeke variety taeore was selected for the making of the miro lengths, this variety has a good fibre length. Strips of leaf ranging from 1–1.5 cm wide had fibres extracted using the haro technique. The fibres are divided and top and tailed, because the fibres are coarser at the lower end and taper thinner to the tip end. The plying or miro is worked over the thigh by rolling the divided fibres in a downward direction till they meet, at which point the fibres are rolling upward so that they ply together. For a consistent plied twist down the full length, the plying is done at regular intervals, pinching the plied section so that it will not unravel.

The lengths are dyed by first soaking overnight in hīnau tannin solution then submerged in iron-rich mud, again over night, before being rinsed clean of mud.

### *Design*

This rāpaki presents an intriguing design because every fibrous element is black without any contrasting feature, which is rare. The black feature could have contributed to its function of being hard to see at night and the miro plied lengths would be flexible and, without leaf sections, would not cause a rustling noise during movement.

### *Condition*

The condition of the design is apparent, with losses resulting in holes in the central part of the waistband and many detached lengths kept in a large sample bag. It does, however, have sufficient remaining in its make-up to appear to be whole. The miro lengths have retained their twist in ply with no noticeable loosening. Like the previous rāpaki, it is stored flat on Micro chamber board within a metal drawer.

### *Conservation*

The stabilizing treatment for the all-black rāpaki is like that of the previous one—to apply a vaporized consolidate to arrest the continual fragmentation of black fibres—and also

requires a once-only approach. Unique in its make-up of having only dyed black fibres, it presents itself well to being treated overall with a consolidate. The first part of the treatment would be to align the plied lengths and separate them into layers for isolated treatment with a consolidate. This work would begin with the lower or most underneath layer. Once the consolidation treatment of applying and drying was complete, the decision to support and store in a permanent state would need consideration.

The first consideration would be to provide a support system that eliminates movement of the black fibres. The losses in the foundation, are obvious however this appearance could be reduced by ensuring that the underlying material was of the same hue of black as that of the rāpaki. Losses are often supported to reduce or eliminate stress to frayed elements that could lead to further loss. In this case the fragile black fibres are not strong enough to apply any direct intervention with needle or consolidate.

A permanent support system that eliminates movement could be achieved by providing a nesting or recessed surround, which has no space for the fibrous elements to move into. This type of support does, however, slightly compromise the overall visual dimension of the taonga, although a careful choice of surrounding archival materials that make up the support can highlight the rāpaki.

In the making of the storage support for permanent fixture, consideration should be given to the function of display. The storage support system could also be used to display the rāpaki if the materials that surround it were sympathetic to the display case. In this case, a neutral colour palette would conform best to any surround.

### *Display*

The display of this rāpaki would be much like the previous, flat on a slight angle. The same display parameters would also apply. Accompanying text could give detail of the miro lengths and suggest that it was possibly worn at night and that the black elements served as a camouflage and the miro lengths minimized any rustling sound.



Figure 49. Detail of miro lengths on rāpaki ME2085.

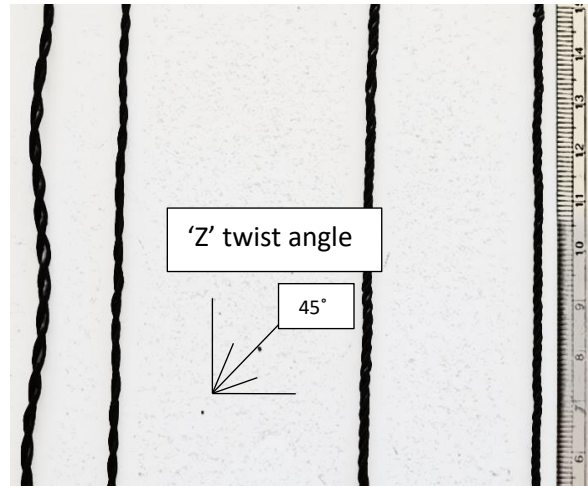


Figure 50. Modern miro lengths.

### Attempted replication of miro lengths

Muka was extracted and plied into lengths before being treated with pōkākā tannin solution and submerged in iron-rich mud. Two harakeke leaf strips approximately 15 mm wide were extracted of their muka. The muka from one leaf strip was laid upon muka of the second strip ‘top and tailed’ so that the lower courser fibres were laid upon the upper thinner fibres of the second strip. This measure would ideally produce an even course of fibres. The layered fibres from two leaf strips were then divided into two. Each of the divided lengths was then divided again and each rolled over the thigh to ply the fibres together.

An even twist, or ply down the miro length, requires a reasonable downward rolling pressure applied at intervals, making sure to pinch what has been plied to avoid the fibres unravelling. This exercise takes a concentrated amount of effort. As I wove this replica sample I reflected on the construction and marvelled at the hundreds of uniformly plied miro lengths on the rāpaki ME2085 at Te Papa.

### **3. The Durham pauku (DUROM. 1971.232.B)**

The Durham University Museum received a pauku in 1971, and, according to the museum's staff, it was donated by a member of the Trevelyan family, a forebear of whom was an associate of Sir Joseph Banks. Banks had gifted artefacts acquired during voyages with Captain James Cook which is how the pauku was received by the Trevelyan family and housed in their private museum collection. The pauku was amongst several other artefacts donated, some originating from South America—Chile and Peru—some Fijian and Tongan war clubs and Chinese lotus shoes. The pauku dates from about the late eighteenth century, is a rare cloak and it is extremely unlikely that any exist in New Zealand (Nicholas 2016, 107).

The pauku represents a taonga of the pre-European contact period, not known by its descendants. Today's weaver of Māori textiles would be very privileged to be in the presence of such a taonga. Although my visit to the Durham Museum was brief, my analysis of the pauku was especially important and it had a lasting impression on my research. Photographs are the only source of reference to describe the cloak. Every attempt to replicate a sample weaving of the pauku is subject to a critical review by a practitioner or practitioners who may dispute my current analysis of this work, and any criticism of the discussion is welcome to further our understanding of this rare and valuable object.

#### *Description*

The pauku, also known as a pukupuku, is a prestigious warrior's cloak, and its compact weave is impenetrable to sharpened weapons. The cloak at first sight appears simple in structure, flat and slightly rectangular, however closer examination reveals that the weaving is intricate, particularly in the tāniko border (Figure 51). The main body, kaupapa, is plain, woven close in single pair twining weft rows without spacing. The tāniko lower border is approximately quarter the height of the cloak and woven with both black and undyed wefts. The tāniko features two sections of different weaving that alternate across, each repeated three times.





Figure 51. Pauku overall, obverse view. Durham Museum

### *Material processing*

Fibres extracted from the harakeke leaf are plied into whenu and aho, threads, as described in the making of the rāpaki. These threads are, in most cases, plied tightly, this property being necessary to provide strength and to be compact.

### *Aho*

The aho is the active thread throughout the weaving of the kaupapa, and its form contributes to the compact weave that provides protection. The aho over the kaupapa is undyed and woven row upon row without spacing, making for a strong foundation, impenetrable to a wooden weapon. The aho measurement per centimetre is approximately six. Early Europeans describe this as a thick heavy canvas (Roth 1979).

The aho plied over the thigh is worked immediately after extraction, so that the fibres retain moisture and stick together. As described previously, the fibres are separated and top and tailed to achieve an even coarseness. Two lengths of fibres rolled under the pressure of the palm over the thigh in one direction, then back in the opposite direction is, in the first part, a

technique known as splicing and, in the latter, as plying. A natural microfibril angle of a ‘Z’ twist also contributes to its twisting. Māori also produced a very tight twist at a thirty to forty-five-degree angle by rolling firmly three groups of fibres individually rolled over the thigh, pinching each end before allowing them to twist upon themselves. This technique is employed when making kārure of the ringlet-type thrum, where the tight twist unravels after being wet and left to dry. The kārure maintains its form for years, even decades.

On close examination, the aho in the pauku appears to be two-ply, however, it was not possible to unravel and identify definitively whether it was two- or three-ply. A feature of a two-ply aho, compared to a three-ply aho, is that the twist angle is straighter or looser. This feature is identifiable on close examination.

The aho in the tāniko are both active and passive and are both undyed and mostly dyed black. The tāniko exhibits two types of black: a blue-black and a red-black. The difference of blacks occurs because the recipes of tannins and muds differ as discussed in chapter three. In the tāniko, the mainly dyed black aho with a few contrasting undyed aho form a subtle zigzag pattern.

### *Whenu*

The whenu are two-ply and over the kaupapa lie from top to bottom. In the tāniko they appear doubled in a particular pattern, the description of which follows. The twist angle varies however, the majority have a sixty- to forty-degree angle of ‘Z’ twist. As a result of being exposed after the loss of the black fibres, some loose whenu have little twist at an almost eighty-degree angle. The continuous whenu from top to bottom is likely to be achieved with the splicing of fibres near their ends. Increasing length can also be made by laying the new whenu upon the previous one. It was not possible to technically analyze the cloak to determine where joins or splicing of fibres occurred, if at all. In traditional times when constant harvesting made for a healthier plant, long leaves grew and may have produced long leaf fibres for aho and whenu.

### *Commencement*

Determining the commencement of the work is difficult due to the lack of time I had to examine and analyze the cloak properly. The beginning of the mantle appears to start at the upper proper-right (textile's right) corner.



Figure 52. Top proper-right corner of pauku.



Figure 53. Top proper-left corner.

The proper right corner does not have that much volume of woven fibre. It does show plaiting along the top edge and this gradually becomes thicker as it nears the proper-left top corner. Likewise, plaiting also begins part way up the cloak's edge of the proper-left side towards the top proper-left corner. At the top left corner is a short length of plaited fibre which may indicate a finishing. For the plaited edges to have body it is likely that the whenu are doubled.

### **An interpretation and reconstruction of historic weaving**

A previous attempt to start this work, where only single whenu were woven, resulted in the work curling, not linear. Doubled whenu were woven which can be separated for the different woven patterns in the lower tāniko border. Separating the two whenu into single whenu would then contribute to the slight outward angle at the lower proper-left corner. The separation of doubled whenu appear at every third or fourth whenu. The whatu aho

tahi, single pair twining, of two whenu compacts the body of work and keeps the work linear.

Single pair twining (aho tahi) is woven over the kaupapa and continues up to the beginning of the tāniko border. Nine aho rows are woven with alternating shades of black, a red-brown, black-typical of fibres pre-treated with tānekaha and a blue-black, pre-treated with hīnau or pōkākā, as described in chapter three.

The central part of the tāniko past the nine rows of whatu aho tahi is much more complicated. Four different techniques of twining appear over the tāniko, and two are worked. each in two alternating sections. The sample replica begins with the linear and raised zigzag pattern section, the linear weave is described first, from top to bottom. The mainly black facing aho is worked over the vertical warps and, in places, for a design, a passive aho is as well. Two weft rows worked in black aho tahi then a contrasting undyed weft row forming a linear line is thinner than the black aho and weaves are slightly recessed. The undyed linear row continues for twenty-eight whatu stitches—in this case—and discontinues before being worked into the raised vertical zigzag pattern as a supporting aho.

After the linear undyed aho row, two black aho rows change weave direction, the black aho passes under the whenu and linear supporting black aho and comes to the face from above the black supporting aho and passes down over it before repeating—under whenu and linear supporting—up from under at the top and passing down over the supporting aho. This weave is worked between whenu and forms a vertical rather than an angle whatu stitch over the whenu as seen in the previous black aho rows. The two black aho rows of angled and vertical whatu alternate between each of a single aho row of undyed muka. This work makes a series of linear lines—made up by the undyed aho—in a pattern from the upper to the lower part of the border. This work, referred to as the meandering square, is seen on kākahu of this period, both pre- and post-European contact (Roth 1979, 74).

The raised whenu, worked in short vertical lengths parallel to each other that taper into a vertical zigzag pattern, begins after the meandering square. The raised whenu starts with the black aho from the first of two angled aho rows, whatu over two whenu twisted together to give a rounded form rather than two in parallel. Two black aho are worked in whatu aho

tahi in half twist over paired whenu for five whatu before beginning the next meandering square section. The next two black aho from the second angled rows are separate, each whatu over the paired whenu in a full twist with an undyed aho from the following row. The second weaves one paired whenu before the other starts and ends before the last finishes. This gradual taper forms the downward zigzag pattern. The meandering square and raised vertical zigzag alternate for five sequences and feature in three sections across the border: left, centre and right. In some cases, the paired black aho in the meandering square is worked only in angled whatu without any vertical whatu.

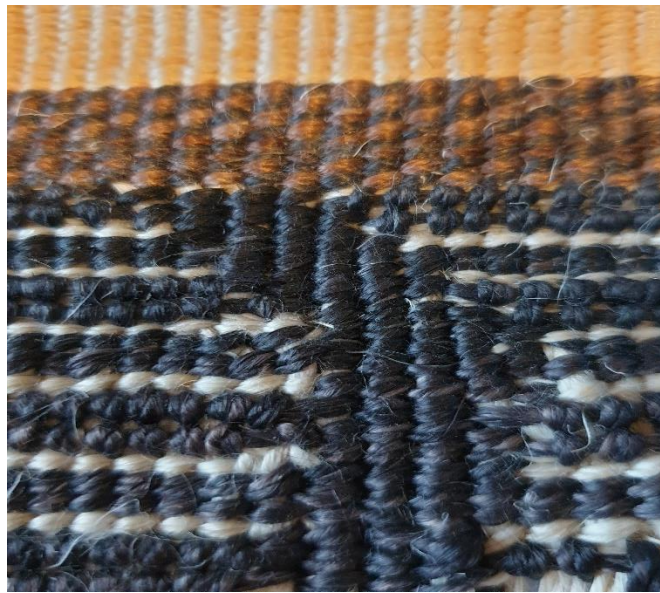


Figure 54. Detail of replica of meandering square.

The next part of the weaving is more complex and has an overall textured surface worked in the black aho and sections with a subtle narrow vertical zigzag worked in undyed aho. The active black aho worked in a half twist alternates over a raised and recessed whenu. The black is in most part whatu aho tahi. In some weft rows, the black aho are twined vertically. It appears the passive aho behind the whenu allows the facing aho to be woven top to bottom, rather than on an angle, as usual.

A change in weave direction and structure after the raised whenu work and rectangular design starts a different pattern. The aho, mainly black, continues in aho tahi however the weave direction appears to change in the weft row, from top to bottom and from bottom to top of each single twined stitch. The twined stitches are woven over the whenu and

supporting aho. The whenu also appears to be placed either to the right or left of its vertical alignment. This work results in a slightly textured surface with a zigzag pattern.

In part, a contrasting zigzag in natural muka is to the face of the weave. Three whenu, the first with the underlying undyed supporting and facing aho that continue from the meandering work, are whatu together with the black facing aho. This whatu gives a raised effect in the weave. The second whenu has an undyed aho passing over it before whatu with the black aho and is less elevated than the first. The third whenu is whatu with the undyed aho, which is part of the subtle narrow vertical zigzag pattern. This work repeats in the following row; however, the first whatu whenu begins one before the previous.

The twist of whenu, facing and supporting aho, attributes to the strength and textured surface to form a distinctive design between the built whenu work, rectangular design of contrasting black and natural lines. The processing of the threads is a deliberate exercise to achieve body and strength, like a thick canvas, and to function as armour.

### *Design*

The tāniko in the pauku is intriguing in design and construction. The weaving technique, working the tightly plied warp and weft threads, makes a textured surface. The aho facing whatu, over the sometimes doubled or repositioned whenu, form a rare form of Māori weaving, certainly not seen in modern times in Aotearoa. The textured or raised weave of the two repeated main patterns resembles the motion of the sea. My interpretation of the section in second and fourth place across the tāniko is much like the waves peaking and recessing, in an overall consistent pattern, much like the lozenge pattern. Gooley presents a technical note for this water pattern as ‘Clapotis gaufre’ or “waffled clapotis” (Gooley 2016, 190-191). The vertical raised zigzag pattern and the meandering square resemble the tide lines which for the voyaging ancestors would have been closely observed as part of their navigational skills (Figure 55) (Thompson 2019, 96–97).





Figure 55. Detail showing meandering square.

#### *Interpretation of the design: Kiwa*

Black is the primary colour used throughout the tāniko border, and from a distance, it appears to be all black. The subtle inclusion of the undyed threads in the linear meandering and vertical zigzag contrasts nicely with the textured blackwork. The black textured weave casts shade in the adjacent recessed stitches. The recess weave of ‘black on black’ is a typical feature seen on early traditional kākahu. This technical note of a changing weave direction worked in black presents more than a visually textured surface but also, in context, represents the deep, dark sea.

During their great sea voyages, Māori practised ready reckoning—guided by the positions of the stars. They named the stars and noted their location in relation to the sea’s behaviour, or sea swells and waves, at the same time. This constant practice adhered to with karakia would guide their passage through the night. The largest ocean on the planet—Te Moana nui a Kiwa, presided over by the atua Tangaroa—commands the utmost respect and Māori would have been most respectful.

The voyages, and there were many in these surroundings, shaped the cultural practices of those who recorded and recognized the great atua Tangaroa. My interpretation of the tāniko weaving in the pauku reflects that cultural recognition. ‘Wapōkere’ is a weaving term that is known through my whakapapa and refers to the black weaving in tāniko. The word pō in this instance denotes the colour black. Te Pō is also known as the source of Māori origins and is recited frequently in traditional karakia (Buck 1950, 435–436).

### *Condition*

The condition of the pauku is fair. The kaupapa is reasonably sound, and the few apparent holes have not caused further surrounding deterioration. The poor state of the tāniko is apparent with significant losses of the black muka and collapse of the woven matrix. The exposed undyed loose threads without alignment are vulnerable. The continual fragmentation is substantial, and fibres lie upon the supporting archival board.

A regular linear area of lost black fibres appears across the border, whether this loss results from over exposure in one part and not in another or is an inherent weakness of those black fibres, is not known. In a narrow band above and below the main tāniko, the red-black muka remains stable in comparison to the blue-black. This condition may be related to the processes of dyeing the fibres black and the variation of tannins used as referred to in chapter three.

A smear of red matter likely to be red ochre over the lower part of the kaupapa may be a deliberate application as this condition is typical of the hanahana cloak (Best 1898). On the kaupapa is the faint appearance of vertical, darker, and regularly spaced lines. The dark lines are indicative of light exposure and, in this case, suggest that the cloak could have served as a screen. A notable pale patch of irregular shape is recognizable about the centre, upper half. The distinctive shape suggests that something like a piece of cloth lay on it for an extended period. Watermarks appear overall without relevance to any damage or areas of loss. At the lower proper-left corner the plaited length with once attached, bound awe-kurī fur, is loose and insecure.



### *Conservation and stabilization*

Stabilization of the pauku would begin with overall and detailed photography and follow with a controlled vacuum surface clean. Photography not only records the condition before intervention—if any—but also provides a reference of the material construction, a tangible tool in research. The surface clean is much as it suggests, however, the decision to remove soiling depends on whether it is causing damage to the physical make-up of the material or is an integral part of the object as ethnographic soiling. In most cases, the former applies. In this case, the smear of red ochre on the kaupapa is historically significant and should remain. A thorough examination of all surface soiling before cleaning would be necessary.

Continual loss of the black would need some intervention to prevent this occurring, which is achievable with the application of a consolidate. The consolidate would, however, need to be applied to the disintegrating black fibres, which are adjacent to stable fibres. The challenge is not only in the method of application but also in localizing it. A consolidation treatment that addresses only the deteriorating black threads would be an extensive conservation treatment, and several technical trials would need to be performed and evaluated for their efficiency. The plaited length that retains remnants of kurī fur would need securing with stitches to the edge of the cloak.

Support to avoid further stress and/or loss to those areas of collapse or loss is necessary. The holes over the kaupapa are not significant but are vulnerable to further damage if not supported. Support material stitched to the kaupapa such as cotton organza with muka stitched onto it that mimics the original stitches lost, would provide support, and restore the aesthetic value. This method of support would also need trialling. The support directly under the cloak should either be in keeping with its colour or sympathetic to it. Apart from the consolidation of the deteriorating black fibres, the support work is reversible. The conservation treatment would enable more controlled handling to allow preparation for display.

### *Display*

The display of the pauku would require flat support on a slight angle, not exceeding 45 degrees. Light levels not exceeding 50 lux and or sensory lighting are necessary. The pauku

is not available for display in New Zealand, however, an alternative to seeing such a unique example of taonga would be an actual correctly dimensioned image transferred onto cloth. This display would provide an interactive, where the visitors could drape the image over themselves to get an idea of how it is worn. The cloth image would also have an accompanying tactile woven sample of the weaving techniques employed in the construction of the kākahu. Accompanying text that described the function of the pauku with a detailed image of the weave including a ruler prop showing millimetres would be required.

### **Discussion and interpretation**

The pauku is rare and for two and half centuries has been distanced from its descendants and the people of Aotearoa, disconnecting them from the mātauranga held within. The pauku is not only testament to craftsmanship but also retains whakapapa, and in my interpretation, represents the whakapapa of the sea: Tangaroa, Te Moana nui a Kiwa, Aramoana (path of the sea), whatumoana (eye of the sea or weave of the sea), pātikitiki (flat fish). Pātikitiki and Aramoana are tāniko patterns common to our modern weavers.

The tāniko work in the pauku is rare and unlikely to have been seen by Māori since its acquisition in the late eighteenth century. The material preparation and construction presented would be new information from old technology for the modern weaver and for the general textile study body of knowledge. This study did, however, describe some old technology that today continues and that is the thread, whenu and aho preparation of plying miro. This technology is believed to have preceded the craft of spinning, which dates to the late Iron Age (Kromer 2016). Comparison with the weaving techniques of our Pacific Island and the material construction of their costume demonstrate that it is quite different.

The Tahitians, however, do have examples of twining and plying miro in their culture. Unfortunately, I have not had the privilege of seeing examples of plying and/or weaving from the Tahitian Islands.<sup>26</sup> From my discussions with weavers, the twining technique appears in a traditional cloak like a kaitaka paepaeroa. On the outskirts of the Pacific, the islands north of Japan also exhibit twining in their traditional costume. Further into the

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<sup>26</sup> Personal Communication Tracy Tangihaere 2019 who saw a cloak in Tahiti of the same make-up as the kaitaka.

Middle East twining and plying of threads have been identified in textile fragments excavated from archaeological sites. Historical textile accounts of twining in early civilizations prove the technique was widespread and as far as the last lands inhabited by humans, namely Aotearoa.

The adaptation of the twining technique in Aotearoa is unique, as seen in the pauku. The weaving of the aho in various directions and at times over more than one whenu presents a textured surface. The textured surface reflects and refracts light across the work and supports the visual narrative. The narrative or design of the whatu depicts, according to my reading of the pattern, the most incredible human feat of voyaging across the largest ocean on the planet.

The textured surface of the pauku tāniko work captures the sea's behaviour as observed during the great voyages. By day, the sea swells and currents indicated the wind direction, and by night, the positioning of stars—ready reckoning—showed the location (Thompson 2019, 97, 266). This constant practice of traditional seafaring, without a compass, has baffled historians, anthropologists, scientists, and other researchers for many centuries. In some cases, explorers who later navigated this vast ocean had difficulty in accepting that Polynesians had sailed the great Pacific Ocean without navigational tools, and fabricated myths of 'accidental' discovery that discredited their skills, suggesting that it was by the luck of drifting that they discovered Aotearoa.

My analysis of the taonga reveals the mātauranga that is literally woven through the garment. The tāniko in the pauku, as I show above, captures within the whatu stitches a record of Polynesian intellect and traditional knowledge that for too long their descendants would be deprived of. In conforming to a western mindset, and governed through a colonial system, Māori lost their cultural identity and eventually succumbed to social inequities that are evident today, as pointed out in the introduction. I find it disrespectful that the term 'mat' or 'dress mat' was the early term for such fine works of weaving and mātauranga, and even more alarmed to hear the term used recently by a Māori person who was asked to assess a kahukiwi, yet another example of being disconnected from one's culture.

The restoration and ownership of traditional mātauranga retained in the pauku can be recovered by reciting the narrative and practising the material construction. In the

reconstruction of the pauku, deployed here as a sampler, the technical execution embraced both male and female contexts. Through the twining of the aho over two whenu every third whatu and at times the inclusion of a supporting passive aho, the work made for a compact woven matrix that provided an impenetrable cloth of armour. In the same weaving content, a subtle contrasting undyed thread highlights the contours of the sea movements. The reproduction of this mātauranga is enlightening and it is empowering to capture and own the mātauranga that makes up one's identity.

It will be a pleasure and an ethical responsibility to pass this mātauranga on to those that are without identity. In this execution, the connection is with Te Ao Māori and Te Taiao. The procurement of material resources from Tāne Māhuta, repo and harakeke, recap the essence of Te Taiao. Today, the recognition of nature and its fundamental part in existence with humankind is more pronounced than it has been previously. Environmental awareness that addresses water quality and the cleanliness of rivers and streams that settle into wetlands or repō are all relative to a state of well-being. A confronting issue for current politics to address and improve the condition of many polluted waterways is more prevalent today than it has been in the past.

## **Conclusion**

The physical presence of taonga can be emotional, inspiring, a moment of no words, only a feeling. On occasions when hosting visitors to Te Whare Pora at Te Papa, the reaction of visitors is a rapture of pride and connectivity. As it was when *Te Māori* returned from the United States, Māori realized their disconnection from Te Ao Māori and importantly their identity. Significant changes in the museum sector from that time have pursued a reconnection of taonga and tangata whenua.

The case studies described here are a few examples of such taonga representing the traditional world of Te Ao Māori. In the first rāpaki at Te Papa, whilst simple in construction, the preparation is more complicated and requires a skilled hand. To mimic the black small fibrous sections in the pōkinikini (ME2086), took several trials. The second rāpaki at Te Papa (ME2085) with hundreds of plied lengths would have caused a red and

hairless thigh upon which each rolled. Tireless hours of preparation require a dedicated degree of concentration to maintain the correct technique and design.

The construction and design in each garment have both functionality and, to my mind, visual representation. The simple construction of the rāpaki would afford a readiness to fashion such a garment. Considering this, the rāpaki or kilt, as described in early civilizations, could well have preceded the cloak. The kaupapa of the rāpaki and the layering of pōkinikini would have provided warmth whilst allowing the wearer to be mobile. These features can also be seen in the rāpaki at Te Papa (ME2085), although distinctively all black, in this case, functionality and design are deliberate. The all-black elements were likely to provide camouflage as night attire and possibly representation of the night, Te Pō.

In the absence of holdings of taonga kākahu like the pukupuku, along with their associated of traditional knowledge, which are held in collection stores mainly in the northern hemisphere, I would argue that a deliberate attempt to investigate their make-up should be undertaken with strong relationships between museums. Over the last several decades researchers have received scholarships to analyse traditional kākahu held in museums abroad. It was on such an occasion that my mother Diggeress Te Kanawa and her close friend and weaving colleague Emily Shuster (both now deceased) travelled to the United States and United Kingdom in 1972, to view traditional kākahu held in various museums. They described their experience as lasting forever and as something that inspired their awe of the intellect held in the kākahu they were privileged to be presented with. My mother mentioned that on numerous occasions they were overcome with emotion and often a karakia would be recited to acknowledge the mātauranga of tūpuna held in the taonga.

Taonga kākahu, such as those described in this chapter, embody such values and beliefs of Te Ao Māori, captured in the materials sourced from Te Taiao, the technical execution, and the narratives of mātauranga Māori. The disconnection of mātauranga, because of colonization, now places an ethical responsibility on the very western construct of the museum to reconnect taonga to tangata whenua. The following chapter captures the mātauranga of taonga described here and Te Taiao of waiwai and paru presented in the

previous chapter and discusses how Māori today can embrace and apply the tangible and intangible values of Te Ao Māori.

## **Chapter five:**

### **How to connect with taonga**

#### **Introduction**

This thesis has explored the ways in which taonga kākahu can be understood as an example of mātauranga Māori. I have shown that the cloaks examined in the research are a testament of Te Ao Māori. In the previous chapter, I studied a select few taonga kākahu in museum collections and provided an interpretation of their material process, construction, and design to realize my objective of recapturing and revitalizing the mātauranga within them. This mātauranga Māori can be transferable to descendants, to those who have been disconnected from such systems for almost two centuries. The material processes, construction, and design—including the traditional use of paru in dyeing fibre which I have described—can now be made available to practitioners and weavers alike and Māori people in general, through the portal of the museum and various community forums. In this chapter, therefore, I reflect on the meaning of the research analyzed in previous chapters and discuss how it can be used in the present to address the contemporary issues and problems summed up in the research questions.

The research addressed both the intangible and tangible values of those taonga kākahu held in the collection stores of museums and queried how we can reconnect them to their descendants. The research advocates that we recognize the intangible values of taonga kākahu so that we could explore the mātauranga that is rich in material culture. The research has identified the plant materials and how they are recognized in Te Ao Māori in the natural world of Te Taiao, and that Māori today could be totally aware of that external component value of a kākahu that they could learn of the material make-up, and with each of those materials their placement in Te Taiao. This is relative to the land and a person's placement or connectivity to those landmarks and their respective names, and in their recognition reside a connection and a restoration of identity. Through the material composition of the taonga we can convert each component into a tangible value—something that is physically obtainable and practised in the traditional way. As

demonstrated by the work of practitioners who recently, on their tūpuna land, conducted a workshop of dyeing muka, employing traditional methods using traditional tools to gather and process for dyeing. Observing the protocol, a karakia was recited prior to the collection of material resources. An adze, for instance, was fashioned with carved wood and hand-sharpened stone bound with plaited muka and used to scrape the outer barks of selected trees for the extraction of tannins. In keeping with traditional practice, the exposed tree trunk was pasted with mud. Water collected with a gourd filled an oko (wooden vessel) and was heated with hot volcanic rocks. The bark was placed in the heated water and thereafter the muka was added. When the muka was well stained by the tannins it was removed and rubbed into the wood ash of mānuka, then finally rinsed in the awa that their tūpuna frequented during their settlement. The paru was gathered from the repo in the location of ancestral settlement. These practices are all about connectivity.

The weaving of the processed materials to make the taonga, a tangible piece of mātauranga, requires skill, intellect and a narrative to weave the tangible link to the intangible whakapapa and identity. In this we may assume that the weaver is replicating the taonga in the museum collection store to retain the mātauranga of the fragile item, this is an ideal exercise, however, not one that is obligatory. If the weaver has obtained material resources from their ancestral lands and observed traditional practices, the construction of woven taonga, be it replicating the old or weaving anew, will possess the mātauranga Māori of material culture. The material culture and weaving of the taonga then forms its mauri or mana. I have woven kākahu and gathered materials of my tūpuna land, the harakeke taore, the hīnau and raurēkau of our ancestral ngahere and the paru from the repo through which flows the Mangokewa Stream at the foot of the Pukeora Range. I whakapapa to the land, awa, repo, harakeke, and ngahere. Traditional methods and natural materials and the unique narrative for the making of my kākahu have retained the mātauranga of a people and developed the mana of tangible taonga kākahu.

The taonga kākahu that have been examined in the research date from the pre-contact and early contact periods without European influence. In this chapter, I emphasise that the knowledge and techniques embodied in these taonga provide a means of reconnecting people to the cultural heritage of their ancestors. The objective of this thesis has been, therefore, to present material culture as a means of identifying a sustainable way of life that



is now, for some, distant from modern living. In this exercise the transfer of information through making, wearing, caring for and exhibiting cloaks is a means of reconnecting Māori to their whakapapa and land, in restoring their identity. As I pointed out in the introduction, this is a major factor in overcoming the negative social statistics afflicting the Māori population today. In this final chapter I argue that the informed practitioner embraces the material culture of taonga kākahu, including its customary manufacture, techniques and materials, and in doing so is made aware of how that practice sustained the health and well-being of their tūpuna, and their relationship with the natural environment.

The practice of restoring the mātauranga which I outline here is not only a means of continuing with that material culture but also is a way of contributing to the preservation of taonga kākahu. This practice also affords the museum profession enhanced and culturally relevant methods of conserving and preserving taonga, methods which are better informed about the material composition, design, and construction of those taonga according to indigenous knowledge and cultural practice. The approach I present will support treatment proposals and allow for the preparation of ideal storage systems and environmental controls. It can enhance the information included in digital media and label texts for taonga in exhibitions and displays and help better inform the museum visitor about this precious cultural heritage which is unique to Aotearoa.

### **Taonga kākahu are equal to other taonga**

I am rendered speechless and in awe of the craftsmanship of our ancestors, displayed in taonga kākahu, and I imagine them, in the pre-European and contact periods, wrapped in fine kaitaka with silken kaupapa contrasting with a deep decorative tāniko border. The unique costume of Aotearoa indigenous people should be exhibited for all its finery and skill. Pendergrast showcased a variety of kākahu from the Auckland War Memorial Museum cloak collection in the exhibition *Te Aho Tapu* with the intent to expose kākahu more than they had been. The mana of taonga kākahu needs to be acknowledged for all New Zealanders and importantly for the people to whom they belong.

Today's weavers, and all Māori, who descend from them, should be proud, but there are too many that have no idea of what a kaitaka is. This thesis prepares to change that by presenting what has for too long been the lost knowledge hidden from a people who were

innovative, observant, curious and totally respectful of all things, all matter on the earth and in the universe.

This thesis allowed me the opportunity to interpret the mātauranga woven in to the tāniko border of the pauku. It is such a privilege to study and connect to the hands and minds of our ancestors. Chapter four acknowledges the necessary intellect and execution of weaving in the construction of taonga kākahu. Preparation of the io (warp) and the tāhuhu (weft) is supported by my whakapapa and my wairuatanga as a bold attempt to weave a detail sample of the tāniko and by working with images only. The weaving of threads that work in the narrative is the material connection to Te Ao Māori. Simple in its appearance, yet rich in its detail, the weaving of the sample is at its best the preparation and processing of the muka, dyeing and plying threads. This work presented here accompanied with diagrams is the only means of transferring the mātauranga. It is important that the thread technology is simulated as these properties contribute to the build of the weave and the strength of the pauku. The plied threads are indeed a form of knowledge and a method of thread technology that is one of the oldest known to humankind. They contain cultural heritage of immeasurable value not only to weavers but also to Māoridom more generally.

I argue that the very construction of weaving itself embodies essential elements of Māori cultural identity. The aho contributes both active and passive attributes to the strength of the kākahu, with the passive that runs along the back of the whenu and builds more fibre within the entwined active aho. The active element is woven in different directions and makes up the design or narrative of the tāniko piece. As I show in chapter four, it was enlightening to come to the realization that what I was interpreting in the active aho pattern at the face of the tāniko was, in my view, the pattern of whatu moana or the eye of the sea. The black and natural textured aho, it seemed to me, depicted the sea, or Tangaroa.

The seafaring voyages of our ancestors across the largest ocean on the planet are today regarded as one of the greatest human feats ever achieved. Such a feat would be the inspiration for renowned navigator and waka (canoe) builder, Sir Hector Busby, who employed the traditional ocean navigational skills of his tūpuna. It seems to me that Māori today should be informed of this, they should embrace the knowledge, and be reminded of it when in the presence of, or knowing about the existence of, a taonga kākahu such as the pauku, that partially records or makes concrete this feat. The textured black tāniko work,

where the aho is worked wide and narrow over the tightly plied whenu, can be understood to depict the ripple of sea waves, whereas the raised elongated zigzag pattern seems to replicate the sea currents. This interpretation, which arises out of my analysis of the Durham cloak in chapter four, provides a new logical approach to reconnecting people with taonga kākahu, by recognizing the power of observation and visual recording of the maritime environment or surroundings which have been depicted in a tangible work of art, in this case the pauku.

Other taonga that the thesis analyses are the rāpaki, the waist garment. It was a challenge to replicate the lengths of the pōkinikini for the item held in Te Papa's collection store (ME2086), as I show in chapter four. While simple in appearance they exert a very controlled and fine execution of work of great dexterity. I failed to achieve at first the narrow exposure of fibre that needed to be dyed black on the strip of leaf, although having partial success, and it took several attempts to achieve the correct amount of exposed fibre, little by little, down sections of the length. I could not help but imagine the dexterity and controlled work required to achieve such narrow spaces, working with mussel shells to incise and remove the epidermal matter. I was relieved that the weaving of ME2085, the all-black rāpaki, was not so difficult to replicate. The plied lengths, although varied, were each consistent down the full length. I achieved this only by plying the length at intervals, which produced a consistent twist, as attempts to ply in one action were not successful. When comparing the two rāpaki, I concluded that the one heavily adorned with the pōkinikini was obvious and would have been easy to see and hear with the rustling of its lengths, unlike the all-black rāpaki which would not be so obvious in the dark nor would it cause noise from its plied lengths.

From a weaver's perspective, I would argue that the cloak was preceded by the cape or pākē which was preceded by the rāpaki, the latter being similar in construction to the waist garments of the weaver's former warmer homeland. Each garment has evolved from the technical construction of the previous garments and, the black fibre is prevalent in all of them. Upon arrival in Aotearoa, Māori would have rapidly had to develop a means of covering themselves and based on the construction of the waist garment of their previous homeland, a rāpaki of relatively simple make-up would have filled that need.

It was interesting to note, that one of the oldest and largest korowai WE1892 (Figure 49) stored at Te Papa exhibits both the pōkinikini and plied lengths of black muka, hukahuka, like a combination of elements from the two rāpaki. The hukahuka are densely applied and from a distance the korowai appears to be nearly all black. I hope that one day I will have the privilege of conserving and preparing it for exhibition and to showcase the embedded mātauranga.



Figure 56. Korowai WE1892.

In my view, and based on a weaver's material analysis as above, all these garments depict the night, or literally, in te reo Māori, the 'pinches' of night (pō 'kinikini'). The mātauranga, the knowledge and understanding of the night, is prevalent in Te Aō Māori. The night (Te Pō) has several phases, as heard of during my childhood, that are recorded in the cosmology chart describing the different realms of night which was written by well-known Tainui scholar Pei Te Hurinui Jones and is stored at Waikato University's library.<sup>27</sup> In Te Ao Māori, observations and records of processes and events on this planet, but also

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<sup>27</sup> See: Mahi Mareikura, University of Waikato library: <https://www.waikato.ac.nz/library/about/student-centre/taonga/mahi-mareikura> (accessed November 1 2021).

within the wider universe, are made material through cultural artefacts now often held in museums. Our connection to living nature and the universe is therefore accessible through the mātauranga held in taonga, which can be preserved, revitalized, and passed on through the ongoing cultural practice of weaving and in museum exhibitions and public programmes.

As well as the weaver's interpretation of the knowledge inherent in woven objects, another form of reconnecting to traditional practices of our tūpuna, is through the practical exercises of gathering resources and dyeing muka various shades of black in different parts of the country. In chapter three, for example, I discovered a 'chocolate red-brown' by processing the muka with tānekaha tannin along with the local parū, as well as other recipes that gave different hues of black. It was a fulfilling exercise to go into the field, to places that have significance for local people, and learn about the locations, what they meant and, furthermore, what historical legacy they had. I suggest that this process I undertook as part of this research, working with people to record and analyze their parū sites and gather samples of mud to analyze, and later to connect to taonga kākahu in museum collections through geo-chemical analysis, colour analysis and other techniques, has provided a template for a Māori-centred methodology of museum conservation combined with the restoration of traditional weaving practices.

The research findings are not only relevant to the task of decolonizing or indigenizing conservation and museum practice to better reflect Māori values, but also to the wider task of restoring Māori identity after intergenerational trauma of colonization and loss of identity. This knowledge is one that individuals, as well as whānau, hapū and iwi, can hold onto for the rest of their lives and so is especially important to their identity and whakapapa connection. It is my whakapapa that has connected me, through the means of weaving, to Te Ao Māori, the very being that I am. There is no need for me to aspire to being other than the culture that I belong to and remain proud of. Therefore, I am privileged to exercise that sense of being here in this thesis through revealing the kākahu for what they are, showing their intellectual property and their mātauranga Māori. In today's world, where native and tribal people in many countries are seeking access to their cultural heritage held in colonial institutions, it is evident that indigenous groups are seeking to regain a state of well-being

and restore customary values based on their identity and their genealogy. For Māori people in Aotearoa, I argue that this quest for mātauranga Māori can be found imbued in taonga.

This research has also provided the basis to reflect about future models for weaving, museum work, conservation, and tribal cultural development. I have been fortunate to meet some very skilled weavers and, interestingly, a few that are male weavers. Also, I have been granted the opportunity, through the interviews conducted in chapter three, to speak to one such weaver, Hamuera Robb of Ngāti Kūia (Facebook page: The Pakohe Trails). Robb contributed the only sample of South Island paru for this research, described in chapter three, and has for nearly three years been weaving his tūpuna kākahu. He was inspired by his grandmother who was a weaver.

During my visit with Robb to collect paru, he took me on a journey which demonstrated his sense of place and how he identifies as tangata whenua. We drove fifty kilometres from Nelson to the location and stopped along the way where Robb pointed out over the hills the landscape, estuary, islands, and sea with the Māori names for these places. He spoke confidently about these places and the settlement of different hapū. As we neared the location for the collection of the paru, Robb described the layout of this location where in ancestral times his tūpuna would have established orchards, gardens and an overall sustainable life living at an inlet by the sea. It was not difficult to look over the landscape and visualize the settlement of Robb's ancestors. To hear him recite the Māori place names added so much more value to the visit and to this sense of connectivity to the land.

It was there that we gathered the paru sample and then returned to Nelson. Robb is the only weaver I know today who is attempting to weave his tūpuna kaitaka paepaeroa huaki, a cloak of no adornment that has two tāniko borders. In conversations with him, it was clear that he has wanted to replicate exactly the material processes of preparing and weaving a cloak, as a means of reconnecting to his tūpuna. His work is some of the finest weaving I have seen today, based on a close analysis of old examples in museum collections. The kaitaka he is working on consists of several narrow bands of tāniko vertically placed within the kaupapa and has contrasting whenu. The contrasting whenu appear to be typical of kākahu woven in the South Island. This conclusion is the result of my many years of observation and contact with kākahu that can be provenanced to the South Island. The other

technical feature of the South Island kākahu is that the fibres of the whenu are loose or not plied and appear wave-like between aho rows.

### **Reconnection today**

It has been encouraging to meet with weavers, male and female, who have taken a serious approach to learning the weaving skills of their tūpuna. So, it seems to be that young weavers like Robb integrate traditional Māori knowledge and museum practice or conservation of a practical reconnection to place and identity. He is unique in my eyes in that he is driven by a desire for connectivity. He walks in the footsteps of his tūpuna, he traverses the lands in which they dwelled, he executes the same practices as they did and, so, the weaving of a kākahu, kaitaka paepaeroa or korowai all involve a train of thought that sets the weaver into a stable mental state. That mentality supports the theory of mātauranga, knowledge which is a mental awareness of all things on the planet and indeed within the universe, people, land, the material and immaterial intertwined.

Another male weaver whom I know, has also woven a korowai with some exceptionally fine and detailed weaving. To weave a korowai is a huge undertaking in the modern world as it is for Robb in weaving his kaitaka. Both weavers have a huge dedication and passion for combining all the elements: the whenu, aho, dyed aho and hukahuka. They have a total commitment to the many tasks of preparation then the intertwining of threads to make up this end piece of clothing, which is without sleeves or collar or closed front but instead is a wrapping that can drape from or lie over the shoulders.

Many of the historical kākahu preserved in museum collections have so much to offer in learning and maintaining mātauranga associated with weaving. The weavers I have described here both have museum positions, as collection manager and curator respectively. These weavers have been inspired to take the journey of discovering that mātauranga of taonga kākahu held in the collection store of the museum. For weavers, the museum and its visitors, and Māori in general, are the more learned for what the museum weavers have extrapolated from the taonga they have woven. The positions of collection managers and conservators provide the ideal platform for practitioners and the museum domain to share and transfer the mātauranga of taonga kākahu. Weavers outside the museum can arrange by appointment a viewing of taonga in the collection and learn about the techniques of

weaving but also be informed about museum practices for care and storage of objects. Discussions can be had on the best support systems and environmental controls, and advice can be given on vulnerable aspects of taonga in relation to condition and material make-up. By developing a closer relationship between the museum holding taonga and practitioners working with taonga we have the means of more effectively reconnecting people to the knowledge imbued in these precious heirlooms.

The development of the mana taonga policy at Te Papa, as discussed in the introduction, is a forward movement for the governance and connectivity of taonga and Māori, both within the museum and the community. The question could be asked, however, as to how compatible the practice of museology and conservation is with mana taonga. On numerous occasions the selection of kākahu from the collection for use during ceremonies has been at the discretion of the collection managers and at no time has there been consultation with conservation in relation to the condition and handling of those cloaks which are often very fragile. As a conservator I had advocated for the use of gloves and a condition assessment before and after the use of kākahu, however this was overlooked and currently there is no consultation with conservation, and the laying of cloaks on tūpāpaku. During repatriation ceremonies on the marae this seems now to be an accepted practice. The use of a collection item such as the kākahu as a functional item is undoubtedly a unique practice at Te Papa and can be clearly seen by those in attendance at the welcome ceremony, mainly for repatriation of human remains, and the public via news broadcast. It brings attention to the mana of the kākahu and what it represents in the context of Māori culture for the repatriated taonga, a unique form of reconnection. It could be considered that the practice of using collection items for repatriation ceremonies demonstrates a connectivity for the people that advocate for this practice, or that the aim is to reconnect the repatriated taonga or ancestor and the kākahu from the same world.

Te Papa have acquired several modern kākahu for their collection and recently purchased a kākahu from me. By way of courtesy, the new owner, through a Te Papa curator, asked if I preferred the use of the kākahu. I replied that it should be used at repatriation ceremonies. I know that the kākahu from the collection are of the old world which is why they are draped over the taonga that are being repatriated. Contrary to this however I am aware that faux fur cloaks have been used and placed over the repatriated taonga in the formal ceremonies



abroad when the taonga are uplifted for their journey home. This is interesting and I feel that this practice needs some more discussion. I would certainly advocate for the use of the newly acquired kākahu that is made with harakeke, dyed with paru and the waiwai and adorned with the feathers of manu, in keeping with the traditional practices and certainly woven with the mauri of a weaver, rather than a faux fur cloak.

The thesis has provided some new information to support weavers in their quests to reconnect to a traditional cultural practice. In chapter three the colour variation of the fibres dyed with mud is identified as characteristic of the iron source in the mud. For example, the mud collected from Ruatoria is believed to be rich in iron pyrite, a sulfuric compound present in acidic conditions, that can be identified as a reddish-brown oxide. This material compound is typical of the geological stratigraphy of this region. This corresponds with the consistent red hue in all the fibre samples dyed with different tannins for this region. This information is a means of reconnecting people to the cultural practices of their tūpuna which they may choose to reinstate or, furthermore, to protect and preserve the paru site.

Also, in chapter three the Okiwi mud collected from the cockle seashore (which was rich in calcium carbonate, an alkaline compound), would have contributed to the deep reddish-brown hue of the dyed fibre, but specifically that of the fibre being pre-treated with tānekaha. My knowledge of acquiring a brown dyed fibre is treating the muka with tānekaha and rubbing the fibre into wood ash—an alkaline source (Te Kanawa 2002).

In chapter four the identification of a more stable reddish-brown aho woven in the tāniko border of the pauku may well be attributed to the alkalinity or basic deacidifying property of the mud used. These dyeing methods with both acidic and alkaline properties can also support the course of stabilization in the practice of conservation. Therefore, this thesis postulates that a practitioner's material procurement and methods of processing can support the knowledge base for caring of taonga kākahu.

In chapter two I discussed the current limitations or prevention of display for some of the fragile and aged kākahu. During my career as a conservator, I have changed my attitude toward the conservation of cultural material and the value of museum objects that are disconnected from their descendants. Restricting access to the fragile taonga will prevent the knowledge sharing inherent in the taonga, therefore a new directive of object

management and research should develop a collaborative practice for the communities of those taonga.

The research findings, analysis and discussion all laid out here, are pathways that explore a means to reconnect mātauranga of taonga kākahu, with scientific museology, and via the knowledge and skills of weaving itself, a cultural heritage practice. Whilst it is not everyone's aspiration to be a weaver or know the skills of a weaver, the procurement of material resources and the health of them in their natural environment is part of the role of kaitiaki, which should include Māori curators and collection managers in museums understanding, caring for, guarding the health of your water and soil, your paru and the natural resources of the ngāhere. These things alone contribute to a healthy state of well-being, for in Te Ao Māori the health of soil and water will return good health to the people. As a result of being threatened by a virus today people are returning to some basic home care practices which include gardening, at which traditional Māori were expert. Their knowledge of plants and soil was extensive. I argue that these practices and knowledge can be implemented today.

In addressing the many challenges imposed by environmental changes and viruses, one of the main political concerns of Aotearoa is the health of our waterways and many measures have been taken to find solutions to cleaning them, for example, the Puniu River Care.<sup>28</sup> The role of kaitiaki requires Māori to be involved in or lead the restoration of the natural environment and improve the health of our waterways and ultimately improve soil quality, all of which will reap rewards through the agricultural sector. It will also enhance the health of the paru sites that contain the iron-rich mud used in dyeing muka black. It can maintain the health of the natural resources of our ngāhere our forest and the return would be beneficial not only for humans but also for birds, insects and the plant life of the forest.

Programmes are being implemented for people in prisons to be a part of the restorative environmental. The prisoners are given the opportunity to learn riparian planting, nursery operations and connectivity to Te Ao Māori as the Punui River Care programme is under the governance of mātauranga Māori. Such a work scheme would fit well into the

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<sup>28</sup> “Restoring the Puniu River so children can swim freely,” (includes videos). The Tindall Foundation. 14 January 2016. <https://tindall.org.nz/5411-2/> (accessed 11 February 2017).

partnership agreement which is based on the partnership model derived from the Treaty of Waitangi as it has Māori acting as kaitiaki or caretakers of the rivers and non-Māori as the landowners.

An important part of my contentions in this study, in relation to paru sites and weaving, is the importance of re-integrating Māori culture with nature, in other words the wider natural environment. The condition of water is relative to the health of all living things including humans. Mātauranga Māori advocates the sustainable management of natural resources and in this practice, fulfilled the role of kaitiakitanga, or stewardship. The health of our soil is particularly important in this world today. The soil quality is fundamental to healthy living, gardens will sustain you and provide nutrients essential to life. Our arts practitioners should obviously be given the opportunity to be a part of the restorative environmental projects, and advocate for plantings of harakeke and native trees that will supply a source of tannins. In sum, Māori today should advocate and be given the rights to put in practice environmental awareness via hands-on projects and advocating for overall respect for Te Taiao.

I strongly contend that harakeke is a taonga. Used extensively by Māori, harakeke was and continues to be a plant of great mana in Māori culture. Early Europeans took great interest in the muka that was woven into the silken ‘mats’ that adorned Māori ancestors. Early European artists such as Sydney Parkinson sketched adult Māori clothed in fine cloaks of no adornment, typical of kaitaka, capes or kahukurī (Pendergrast 1996). European interest in harakeke grew stronger with the intention of establishing a textile industry in the new colony and many investigations into the varieties and their uses by Māori were carried out. More than one hundred varieties were recorded, each of characteristics according to their locations (Cross 1874). European attempts to mechanically extract the fibre to match the quality of that manually extracted by Māori, who used a mussel shell to make their silken kākahu, were not realized and, to this day, have not been achieved by European engineers. By the end of the nineteenth century, Māori were manually preparing the muka fibre of harakeke for European trade and up to three hundred tons of muka in a year were prepared by Māori. This amount of muka equates to approximately 28,000 tons of harakeke leaf for processing, such was the abundance of this taonga. As mentioned earlier, it is spoken of someone who passes that they shall return to their pā harakeke.

## **Applied mātauranga Māori**

With the whakapapa and mātauranga Māori vested in me, and building on the research conducted for this thesis, I am exploring the possibilities of manufacturing a textile from harakeke for application in our modern world, like our tūpuna did in their time. This project has occupied to date over a decade in research to procure a fibre that is equal to that which was extracted with a mussel shell. Early trials of mechanically extracting muka at the beginning of the project, were not successful. The quality of fibre was inferior in that it possessed the cutin matter or para and was not suitable for spinning trials. The removal of the cutin was always an issue and this was realized by early Europeans who developed an extracting machine which founded the flax mills throughout the country in the late nineteenth century. The flax mills produced an inferior quality fibre only suitable for rough finishings such as mats and rope, unlike the manually extracted fibre that could be fashioned into a textile as it was in 1847. The technology employed using a mussel shell very cleverly produced three materials the surface cutin, the fibre muka and the green matter separated in a single action. This mātauranga Māori was applied to a wooden device of mechanical construction and proved successful.

This concept came several years after the initial trials that began in 2004 with Crown Research engineers who were unsuccessful. It was a welcome development to have successfully mechanically extracted muka that was equal to that which had been manually extracted. The next challenge was to soften the fibre and for this the same mātauranga Māori was applied, although with a different method other than pounding. With the mechanically extracted and softened fibre I prepared to advocate the planting of harakeke, so that kilos or tonnes of a quality fibre could be produced and fashioned into a fabric or other products. It was indeed tonnes of harakeke that were manually extracted by our tūpuna, which contributed to their trading at the turn of the twentieth century. The next challenge currently remains to develop a spun thread from the mechanically extracted and softened fibre. The spinning technology was applied to muka, in Dundee in 1847 with manually extracted muka and again in India in 2005. Although the softening method in Dundee is not known, the softening in India was via a chemical process using alkaline solutions. The latter causes the loss of sheen and a reduction in fibre strength.

Today's project prepares to process the fibre right through to the fabric with the only additive being water, as it was for our tūpuna. Contemporary textile industries comprise many synthetic fibres and with this a compromise of producing unnatural material harmful for the environment. I shall continue with the project to achieve a purely natural textile from the muka fibre. Throughout the project tikanga has been observed during harvesting as described in the background chapter. This applies also to not harvesting whilst the tui feeds on the korari—flowering stalks— during summer. The project also advocates planting harakeke along riverbanks, that is, in riparian planting, to improve the condition of the water that has become polluted from over a century of deforestation and agriculture during colonization, resulting in high nitrate levels entering waterways. Riparian planting of harakeke and other plants that can absorb nitrates need to be established.

### **Ngā kupu: nomenclature**

One of the outcomes of this research is the need to reclaim indigenous heritage through indigenous language. While Māori suffered the complex range of impacts on their culture and ultimately their identity and beliefs, their naming of places, events of the past and materials have remained with us today. There is, therefore, a fundamental reserve of mātauranga Māori contained in words, names, phrases, songs, and proverbs connected with places, practices, and objects, which can be employed for reconnection of people to place and culture. Many names of places speak volumes regarding their historical content. In some instances, a name refers to an event, in others it is a description of the whenua or the unique natural occurrences of that place. Rāpaki is a name of a marae on Banks Peninsula in the South Island, named after an ancestor who placed his rāpaki upon the land on his arrival. There may also be names in relation to material resources. In this research I have observed that the materials hīnau and pōkākā are actual place names. From personal communications in 2020 with Rose Mohi of Ngāti Kahungunu, on the East Coast of the North Island, I learned that a name significant to that location is Pakipaki which is a main marae. It is also the name of a cloak or a tightly woven belt. Another name of a place is Maraekākahu on the western Heretaunga Plain, which is close to an old pā site. The reference to clothing in this region is pronounced.

The Ngāi Tahu tribe of the South Island have researched and established a resource called Kahurumanu, which maps their lands and describes the Māori historical content of place

names. This resource is for the benefit of future generations who whakapapa or are connected to Ngāi Tahu. This is an educational reference to their whenua, that the lands on which they were born and surround them should be known to them in a Māori context.

The research has also noted one sample of paru collected from the valley of Wainuioru, the big water from which 'oru' is derived in this case the iron source, and the practice of dyeing the fibres black was carried out in the paddock called Ngawaewae, the 'trampling', referring to the method of submerging the fibres into the black mud.

Place names contain traces of historical connections to culture and to nature, such as the reference to soils, or oneone. Māori males in the past were knowledgeable about the soil as this was necessary to produce good crops. Names of soils are listed in Best (1976, 42–43) and the list is extensive. Such knowledge has become important again in that being forced into isolation through a pandemic, people have learnt or revisited the practice of home gardening and nature has taken precedence again. The knowledge of our forebears, who mastered gardening, of soils and plants and the right times to plant is becoming fundamental to sustaining good health. It is important to note that every sequence of events related to nature has a whakatauki that should be acknowledged. It was once by kai (food), the very source of nutrition, that you could measure one's prosperity or standing within a Māori society, demonstrating the ability to feed their people and visiting guests.

One aspect of gardening or knowing when to garden is in reference to the stars or cosmology. Māori developed a theory, and consequently a practice, whereby certain stars should be placated to enhance the growth of crops. One thousand stars are named by Māori and one hundred and four of them are in the constellation, according to Dr Rangi Matāmua, formerly of Waikato University. The cosmology or the universe was very much a part of Māori traditional times and can also be followed today. So, although there has been a huge disconnection from mātauranga Māori where many Māori have adapted to a European culture, we can be connected to the theory and practice of mātauranga through Māori names of places, plants and people that surround us in this multicultural existence. Again, on a personal note is that of my name Rangituatahi (of the tenth heaven) as mentioned previously.

## **Museums: Portals to the past and future**

Over my long career, I have observed that many of the kākahu displayed in museums represent the mid- to late nineteenth century and are not well exhibited. In most cases these kākahu are displayed on mannequins so best to inform the visitor of how they were worn, however this display method limits the type of cloak that can be displayed. The mannequin display certainly does not provide adequate support for the korowai with fragile black thrums. Considerations are also directed by the exhibition space available, and, in some cases, there is adequate space for only vertical display which, therefore, excludes the korowai. The display design is at a curatorial and conservation interface, that attempts to best present the kākahu and its narrative. I believe we should educate our visitors to accept losses through understanding the reasons why it is not possible to display cloaks vertically. A more supportive and sympathetic display method, other than vertical, can be just as informative. The visitor would see the actual size of the cloak if it was laid flat, and an accompanying sketch or image could depict how it was worn. Information about the fragile black fibre that dictates the method of display could add to information about the cloak's composition and construction. This explanation of the cloak for both the practitioner and museum visitor could be enlightening. For people who have no knowledge of what a traditional Māori cloak is, what it was made of and what it represents, the museum display is one platform that can fill the gap.

As described in chapter four, the case-study pauku, dated circa 1770 and held in the Durham University Museum, provided one occasion of a taonga connected to tūpuna and mātauranga. For me, this special occasion to see the cloak while in Europe will remain a constant connection. I am grateful for the welcome and support I received from the staff at the museum. They encouraged the participation of people from Aotearoa in contributing to the knowledge of the pauku. With only a brief time in which to view the pauku, I could not examine in detail the technology of the thread and weave but, rather, I was supplied with high resolution overall and detail photographs of the cloak, which have been invaluable.

The mission of the museum, to provide care and ideal storage and display of taonga, could now be expanded to invite practitioners to be a part of providing more context and information about taonga. This relationship with practitioners should be supported by museology in adhering to the obligations of Treaty settlements between the two partners:

tangata whenua and Europeans of Aotearoa. It is, therefore, the museum's responsibility to support and encourage weavers where practical and to engage with Māori weavers and Māori in general to recover information about their taonga that they have been alienated from. During this engagement, the practitioner could learn the museum practices of care and storage systems and about facilities that are ideal for collection storage and care, while museum professionals could learn more about taonga kākahu including the kinds of knowledge about paru, construction, design and colours that have been gathered as part of this research. The gathering of information about the material composition and construction of taonga then could become a permanent record and could be used to inform the museum visitor and importantly the descendants of the taonga.

As described in chapter two the transformational *Te Maori* exhibition brought about a huge awareness of taonga to Māori, non-Māori and, indeed, the world. The response to *Te Maori* whilst in the United States caused our government agencies, such as the Ministry of Internal Affairs and the National Museum, to discuss a means of acknowledging the cultural materials of tangata whenua. The function of the museum is to care and preserve, present and transfer knowledge as an educational output of the taonga that it holds in its collections. It is the portal for connecting people to the past, but also restoring their identity. Māori need to thrive in the present and face the future with their heritage intact.

As a conservator, I conform to the practice and measures taken to care and keep taonga stable and to determine the best course of preventing damage. Being a weaver, I am interested to learn the material processes and the construction of the taonga and, furthermore, being of Māori descent the mātauranga and narratives of the taonga are equally important to me. These aspects of caring and knowledge gathering can be supported by the museum as a portal with a positive outcome for museology and those it serves, Māori and Pākehā, scientists and iwi.

The research involved in understanding the material composition and construction of taonga can involve a relationship with practitioners. This information will then support the best means of stabilizing the artefact by understanding or predicting the compatibility of a conservation treatment and understanding the material composition of the taonga. It will also bring a better understanding of how best to store taonga and control their environments, based on their material composition.



This information-gathering exercise can also further inform the museum visitor viewing taonga kākahu on display. For some time, I have felt that the accompanying texts for kākahu or Māori textiles on display have fallen short in their descriptions. Basic knowledge, such as the material make-up, be it fibre or leaf from harakeke or whatever plant it is, should be essential information. The weaving technique and weave count could be a brief description and for the weaving practitioner would be vital information and certainly for the non-practitioner would be new knowledge. A detailed image outlining the weave count, for example, explaining how many stitches there are per centimetre and how many millimetres, if any, are between the weft rows would give the visitor an idea of the quality of weaving.

Additional information could perhaps be added in a catalogue, that would describe the material processes of the dyed material. This would include the iron-tannate dyes, and the tannins used to procure the hue of black fibre. A scientific note could be added that certain tannins like that of the gallotannins found in the bark sources of hīnau and pōkākā produce a blue-black hue. In this context it could be added that the acidic nature of iron-rich mud employed in dyeing the fibres black causes their deterioration and that aged black fibres eventually perish if exposed to light and moisture and movement.

This condition of the black fibre could also inform the museum visitor and practitioner that the ideal display for taonga is one that poses less stress on the black fibres. The museum display of textile costumes is such that they are placed on mannequin to show how they were worn, however, in the case of kākahu such as korowai that have dyed black thrums this means of display should be avoided as the vertical display can cause stress to the black fibres. Kākahu are of a simple form in that they are shaped square or rectangular without sleeves or neckline and lend themselves well to being placed on a flat display support at a 45-degree angle. Historical Māori textiles that have iron-tannate dyed black fibres are usually in poor condition and losses are often observed. This condition should not however prevent the display or viewing of the textile if it is not subjected to further stress as a result.

In terms of articulating a better and more Māori-focused approach to exhibiting taonga kākahu, in line with the findings of this research, the *Kahu Ora* exhibition in 2012 at Te Papa was successful in several aspects. It featured a good variety of historical and contemporary kākahu, some that were noted for their historical background and provenance to individuals and families. It also presented kākahu without provenance but in poor

condition although well supported on a 45-degree angle on a flat, smooth surface. Videoed interviewees, of whom I was one, described and demonstrated the iron-tannate dyeing process, and another contributor described the various feathers that featured on the feathered cloaks. The most engaging feature of this exhibition was the weaving hub, where one or two weavers had set up their weaving tasks and kindly explained their work to the enquiring visitor. I have been asked, by both Māori and non-Māori, what the kākahu is made of. I am surprised by this question even today. This enquiry is an indication that harakeke, although iconic in Aotearoa, in its different forms is not known to all New Zealanders and that exhibitions like *Kahu Ora* served well as an educational experience, or exhibition as research method.

This thesis has opened another direction in reconnecting people to taonga but specifically taonga kākahu of pre-contact times that are a true testament of mātauranga Māori, and particularly for those Māori who have been disconnected from their culture and ancestral heritage. Today, Māori look for identity in taonga to understand what was involved in the construction and material composition, and to understand the reason why they were made the way they were. My interpretation of a taonga kākahu in this study speaks of the sea, the domain of Tangaroa, which our ancestors were for an exceptionally long time connected to and which they respected, studied, and understood. It was those values that brought them to their end destination where they eventually made Aotearoa their home. The place from whence they came is often referred to as Hawaki-nui, Hawaiki-roa or Hawaiki-pamamao. It is interesting to note that when asking someone from where they come in te reo we say ‘Ko wai koe?’ (What is your water, embryotic surround?). Learning these stories can help people identify with their whakapapa. This is especially important for women who bring life into the world, and particularly those who remain in a relationship or in a situation of harm or adverse conditions that might compromise their well-being and identity today.

This research advocates that the museum should teach mātauranga Māori of and through taonga. It should be made possible for a Māori voice to be heard that offers visitors at least an opportunity for change. There are generations and generations of Māori who have no idea of what Māoritanga is what it means and how you can live by the values of Te Ao Māori. The museum can assist in presenting all of what is truly Māori retained within our taonga.

The best practice in the care of taonga, which I advocate here, is already delivered in part through my work with the outreach arm National Services Te Paerangi (NSTP) and is always well received by the community (see the letter from a colleague in Appendix 4). Over the twenty years of NSTP workshops and EKE, all workshops have been positively received. Learning is always happening, client feedback is positive, and participants often comment that they have learnt much about their taonga. They gain an understanding of the make-up of their taonga and how to care for them, what the museums have and what represents Māori culture.

The museum has taken many steps to advocate the learning of material culture however it has further obligations to deliver more comprehensive programmes that are relative to today's societal deprivation. These programmes could help people engage more with material processes, environmental awareness for sustainable material resources, harakeke, horticulture, and place names, all presented under the paradigm of Te Ao Māori, as demonstrated by the Te Awe project at the Auckland War Memorial Museum that hosted weavers to examine taonga kākahu. I have found the opportunities to examine taonga closely provided by these occasions, as both a Māori weaver and in the role of conservator, enlightening and inspiring. I too am reminded of the mātauranga that was created and retained within the taonga and of the special moment experienced when connecting to our tūpuna. From these experiences of working with taonga kākahu it has become my objective to make the mātauranga known to Māori.

## **Conclusion**

In this chapter I have reviewed the research and reflected on the lessons that emerged. I conclude that several aspects of the research in theory and practice are already in place. The research focus was on those kākahu that have been disassociated from their people since contact. Apart from a handful of researchers conducting independent research, this area of knowledge is largely unknown and should be supported to further reveal the mātauranga of taonga kākahu. These textile objects contain a wealth of knowledge about the people that crafted them and the environment and culture which they sustained for that period.

Conservators and collection managers are the only people that have direct contact with them presently, and related people-engagement specifically with taonga kākahu is not so prevalent. I advocate that dialogue between conservators and practitioners becomes a more

common practice and that museums in Aotearoa designate time and space for this to occur under the governance of the museum and the portal of the mana taonga principle.

This research has identified aspects of Māori textiles composition that have not been revealed previously to weavers and the descendants of taonga. The research into material composition and the process of materials has provided a unique pool of information associated with the museum object or taonga kākahu of tangata whenua. I conclude the thesis in the following chapter by summing up the findings and implications of my research, and my contributions to knowledge, with recommendations for the reconnection of taonga kākahu and their descendants.

## Conclusion

Historical Māori textiles are an integral part of New Zealand's cultural history and for too long have not been recognized as such. This thesis has presented a study of the history, material processes and construction of early Māori textiles that provides a technical description and theory of their make-up. It has explored various avenues to reconnect these precious artefacts to their people and places of origin, in the service of community identity rebuilding. The main research question addressed in this study was: How and why pre- and European contact period taonga kākahu in museum collections should be reconnected with tangata whenua? Based on the research conducted in this thesis, I have highlighted that the mātauranga of the textiles is present in the process of weaving, the materials themselves, and the design and philosophy of the textiles, and that all this must be available for Māori and non-Māori through museums. That is, by means of exhibitions, outreach, and public programmes in partnership with tribes. I have concluded that this knowledge is the vehicle to reconnect people to Te Ao Māori and to restore identity which has been fractured by long term colonial processes, which in turn dispersed the taonga kākahu overseas out of sight to descendent source communities.

This research has also revealed in chapters one and two what the traditional clothing of Māori was following their arrival in Aotearoa. It recognizes the significance of the iconic plant, harakeke and how Māori fashioned this new resource to be made into various forms of clothing. For non-Māori, the research provides a means for them to connect to indigenous cultural histories in Aotearoa, and for Māori it provides a means of reconnecting to the knowledge base of their ancestors, to their innovative developments and to their practices. The thesis informs New Zealanders what taonga kākahu are, how they are made what the weaving techniques are and how the materials are procured processed, dyed, and woven. These practices observed protocols that sustained a sufficient supply of materials through a connectivity to nature, Te Taiao, and its elements which, in turn, supported the identity of the related iwi and hapū.

The research in chapter three identified various plant materials and iron-rich mud dyeing recipes that give different hues of black. These recipes support the theory that because these materials are typical of different regions, they may provide a means of identifying places of

manufacture and, therefore, connections to descendants. During my engagement with tangata whenua I have been heartened by the positive responses of those people who are intimately connected to the land from which the paru and tannin samples are collected and to the knowledge that the exercise of sourcing their material was once an integral part of their tūpuna's way of life. I hope that this work will encourage weavers to return to the traditional practice of dyeing muka with paru from their customary local paru sites, and to look after the health of those sites.

Chapter four describes an experience of much intrigue for me as a weaver and Māori. I believe it would intrigue Māori to learn that the woven craft of their tūpuna kākahu is one of the oldest known to mankind. The technology of splicing and miro of whenu is described by archaeologists who have excavated fragments of textiles that are identical in construction to that of our pre-European kākahu. The elements that made up the traditional taonga I examined were so different to those used in modern construction that it became apparent that much technology has been lost. I closely examined the plying of the fibres in both the warp and weft threads and have demonstrated how the plying is relative to the outcome of the woven piece and its functionality. The ontology of weaving can embrace the weaver for each whatu stitch connects to Io-whenu and creates the kaupapa, the foundation. This technical information can support the decisions of today's weaving practitioners to apply these techniques and in doing so to reconnect to the mātauranga of traditional weaving. I have produced samples of weaving that provide details of parts of the three case-study textiles, although in all cases were challenging, particularly the Pauku. These samples will allow weavers to feel and see how the elements are worked and how material processing and preparation of all elements is relative to the finished work. The exposure to different dyed elements and how they are woven to give a certain pattern, is a new lesson for modern weavers and, importantly, a reconnection to an old practice.

By revealing the mātauranga in taonga kākahu I advocate that these objects are a means to reconnect to Te Ao Māori for our modern weavers, for Māori and, in general, all people of Aotearoa. The understanding of kākahu for what they are, their intricacy, their meaning, their example of mātauranga, has been the focus of this thesis. Māori knowledge is a crucial part of Te Ao Māori, and for many Māori today this knowledge is enlightening and can confirm that they can be proud of their culture. The research in chapter four, through the

analysis of examples of woven cloaks in museum collections, identified the materials and processes which brought out the tangible and intangible knowledge imbued in taonga kākahu. They are truly magnificent forms of weaving, employing one of the oldest weaving techniques, and although at first glance they may appear to be simple garments, in fact they are intricate constructions of many elements, demonstrated by the performance of the aho, in the construction or ‘build’ in the pauku. The descriptive technical notes in the case studies were necessary so that all people can understand what has been involved.

This study has contributed to the practice of conserving taonga. It has reviewed the benefits and shortcomings of museum conservation science and identified further material sources and processes which will help in proposing stabilization treatments. This will enable museums to be more confident in preparing kākahu for display and storage. The research has supported the aim of stabilizing those taonga kākahu that have been limited for display or restricted to the storage rooms because of their fragile conditions.

The information on material composition and processes is provided here for practitioners who might experiment with it or be inspired by it. Both the technology inherent in our historical kākahu and new methods of construction can help retain the existing mātauranga and newly weave the mātauranga by reviving it and/or passing it on. There are weavers who are extremely interested in the construction of kākahu. My work has illuminated the construction and the material processes that will contribute to the practitioners’ course of resourcing and processing materials. The taonga kākahu of the pre-contact period are almost in a league of their own and they have a complex and unique make-up that holds traditional mātauranga Māori within.

A significant finding has been the recipes of the black-dyed fibre and the discovery of the red brown using the iron-rich mud and tānekaha in the East Coast region which is groundbreaking information to share with weavers and museum staff. I am excited about this finding because this colour is the same as that seen in our historical kākahu. This is technical mātauranga that can be passed onto contemporary weavers who might choose to produce it and, in doing so, connect with Te Taiao. The research shows the uniqueness of a certain iron-rich mud and tānekaha tannin that gave a reddish-purple colour, where the iron-rich mud was rich in calcareous matter or decomposed shellfish material. This is a good outcome of the research, that could support a means of finding provenance for the taonga of

the people from Okiwi Bay, Nelson. Furthermore, another result was the hue of red consistent in several dyed fibres samples each with the same iron-rich mud but different tannins. The research identified a property in the iron-rich mud that is geographically typical to that region, again another source that may identify provenance in some traditional kākahu, and ultimately a connection to those people of that land.

My close visual and material analysis of the three taonga kākahu in museums in chapter four results in a new interpretation and understanding of the art of weaving. The technical discussion in both the rāpaki in the plied lengths and the finely worked pōkinikini is a good analysis and transfer of mātauranga to weavers, descendants, and future generations. The weaving techniques in the pauku, ones that we have not seen in Aotearoa, are of particular interest and can be passed onto weavers, and Māori in general because the interpretation of this weave, in my view, depicts the sea, the sea surface waves with meniscal lozenges formed by the alternating weft woven wide and narrow. I have connected this interpretation to an oriori written up in *Nga Moteatea*, that includes an instruction to the weaver to “weave the wide and narrow threads, to weave the ocean upon which your tupuna travelled from the shores of Hawaiki” (Best 1956, 205).

In addition, I have identified the narrative of the pauku. We can theorize that for the long periods of time in which Māori were voyaging the oceans, this environment became part of their life while holding utmost respect for the moana, presided over by Tangaroa. So, it is understandable that one would record this time upon the sea with something like clothing, in this case the weaving in the tāniko border. It would also support the significance of the pauku the warrior cape which was impenetrable to a taiaha pou whenua. (hand-held wooden weapon). The weaving I have referred to as the ‘build’ contributes well to the cloak’s function.

Lastly, drawing on my background as a weaver, the thesis has shown that there are many categories of kākahu, and there are varieties within each category, such as the kahukurī. I have argued that all New Zealanders should know what a kākahu and/or korowai is, and it is the task of the museum to educate people about this. The research also acknowledges that for some years weavers have employed new materials in innovative ways, although employing traditional weaving techniques. However, I have argued that if they knew how to source the materials and where to gather them, and how to use paru from a local paru site to



dye the muka, they may be inspired to work with those materials and thereby return to nature and their own cultural heritage.

In terms of an academic contribution to knowledge in the fields of museum studies, museum conservation, and Māori studies, this thesis enhances our understanding of several issues related to the research questions. The mana of taonga can be researched through the museum portal, reconciling science and mātauranga, the roles of conservator/weaver, and exploring new avenues for reconnecting taonga to whenua and iwi. The western construct of a museum, with its strong science base that in some cases has prohibited the exhibition of kākahu in poor condition, should develop not only a research programme, which exposes more than just the physical object in its poor condition, but also new analysis, and should advocate for interpretations of the construction, design and the causes of the poor condition of some taonga kākahu. The museum could elaborate on this by including information about the material composition, procurement, construction and mātauranga, and then profile the people who created the taonga.

The thesis has added to our knowledge of taonga kākahu, and how preserving the integrity and mana of the taonga can be transferred or made known to the descendants of the makers of these taonga. This information is a means of learning whakapapa and restoring identity and provides a narrative for the museum curator to exhibit. The research provides good technical information which is not often presented in association with museum displays or texts related to taonga. The information provided in the research can contribute to a better understanding of the material composition and processes of the taonga for the practice of stabilizing or conserving and can enrich records documenting the material composition.

Of course, there are limitations to this study. The limitations include lack of access to pre-European kākahu the majority of which are overseas. To extrapolate the weaving technique the work was carried out using high-resolution photographs and only one visit with limited time was made to physically examine the case-study pauku. Limitations are also evident in that the research focused only on one area of the pauku, that being the tāniko, with no interpretation of how or where the cloak began or finished, or how each woven row began or finished. This is problematic for contemporary weavers who are looking for information about how the weaving begins and whether it begins at the top or at the hemline, and how each weft row begins and finishes. There was not enough time to measure the angle of twist

in both the warp and weft threads of the pauku that were exposed. However, even with adequate time it would have been difficult to gauge this twist if for some years it had remained unravelled from the woven matrix of the work.

The research was also limited to a certain number of mud samples. While I was able to collect samples of some geographical representation only one sample was collected from the South Island. There were limited resources and time to carry out collection of more mud samples from other regions of the South Island and, indeed, the North Island. The research accepted that the majority of paru sites would have been depleted by the development of agriculture and horticulture, and the introduction of drainage, engineering of water ways during colonization. I also became aware that historical Māori sites, such as pā and regions of settlement, are no longer populated and, therefore, locating paru sites was almost impossible. I had to also accept that samples dyed with mud that are provenanced to a site are rare and of the two cases that were obtained, one was from my family and the other possibility was from the Brancepeth Station paru site, which requires further sophisticated analysis.

There are several questions which can be explored in future research. More work is required, for example, to extrapolate the weaving techniques of those kākahu held in museums overseas. This is necessary to bring back to Aotearoa the mātauranga of those kākahu of which Māori and New Zealanders have no knowledge. In cases where we aim to find as much of the cloaks' make-up and the knowledge imbued in them, we could also research how technological applications can support the transfer of this knowledge. One means could be to transfer the actual image of the cloak onto a fabric so that people can appreciate the size of the original and can see the patterns and techniques.

Those traditional kākahu housed in our museums in New Zealand, that have never been displayed because of their poor condition, should be shown either in the collection storerooms or in exhibition spaces. Research should be conducted to provide the best supports, preferably ones that are permanent for storage as well as for display. Often the traditional kākahu are large and in most cases fragile and should not be displayed vertically, therefore adequate space and suitable display parameters, must be considered. Further research should also be carried out on the construction and patterns of the traditional tāniko

borders that are in some cases in poor condition due to the deteriorating dyed black elements.

Initially this thesis set out to identify the elemental composition of the mud samples with the objective of identifying provenance. As many of the traditional kākahu are without provenance, elemental analysis may help identify places of origin and people of specific localities. Scientific analysis of the type of tannin extracted from the source of barks may also help identify places of origin. The scientific research into the mud and tannin samples may also assist in understanding the mechanism of degradation of the black-dyed fibres, and could aid in the means of conserving them.

The research recognizes that it was an ambitious attempt to reconnect the taonga kākahu to their places of origin and their people using scientific methods of analysis. The research, however, has taken different and engaging paths in analyzing tāonga as a means of connecting to tangata whenua. It specifically identifies material composition and processing. The identification of the materials alone acknowledges the mana (power, authority, respect, prestige) of each taonga and the place they have in Te Taiao. Māori have whakapapa for all living things and the research acknowledges that each has a place in nature. What was observed by Māori, as the creator or maker of taonga kākahu is in respect of that whakapapa. The intangible and tangible values of each material component make up the mātauranga of the taonga. The practitioner today can recapture this knowledge and connect and restore identity of their tūpuna.

The research identified material resources that were typical of a region. It applied certain analysis, namely colour measurements, to present comparable results. These results were further supported with certain geographical information that may supply a directive for provenance of those materials identified in the taonga kākahu. An important role in the research was the engagement and discussions with tangata whenua. The research drew on the work of conservators Dean Sully, Dean Whiting, and Jim Shuster, working in a decolonized, values- and people-based fashion, in their quest to restore and identify the material make-up of *Hinemihī* (for further, see below).

To conclude, I would like to make several practical recommendations arising from this study. In my role as kaitiaki or caregiver of taonga, I capitalize on all the information gathered through examination and make this known to the practitioners and to tangata whenua at their request. Research conservators and practitioners have significant roles in the restoration and exposure of the mātauranga Māori of taonga. The research identifies the processes and methods employed by traditional Māori in the construction of the materials and how each produces a certain character. The research has identified that connection between taonga and people requires a collaborative practice between the museum as portal and the community. An integrated role of conservator and kaitiaki and or tangata whenua would be a form of mutual engagement that produces a combined knowledge base for people, taonga and museum.

This proposed direction is today recognized in community activity in the natural world of environmental awareness, a subject that concerns all cultures of the world. Te Papa's response to environmental concerns has been showcased in an exhibition *Te Taiao*, that highlighted how the forces of nature and all living things must be acknowledged for their individual contributions to a healthy environment. It drew on the narrative of many museum objects and one such was a tāniko piece that depicts the force of Ruaumoko the atua of earthquakes. This taonga recognizes the preservation of mātauranga that is tangible and intangible. The museum, therefore, showcased the traditional practices of Māori and their connectivity with Te Taiao and how that connectivity and respect are applicable today.

Museums Aotearoa, the national advocate body for museums, could initiate a new vision that supports this collaborative engagement that would recognize the indigenous knowledge of ecological sustainability of the environment. Mātauranga Māori of Te Taiao has been highlighted in research and the human activity that connects to nature, land and water. It expands on the nomenclature of place names that in some cases identify a resource or event that occurred at that place. The place names and their meanings have for most of European settlement been ignored and yet, for the retention of the whakapapa of land and natural resources, these meanings should be made known and pronounced correctly. The place names are a unique part of the landscape and retain that mātauranga that is, in some cases, related to the knowledge base of the taonga. Much like a natural connection between child and parent and their respective lineage, taonga and people are linked with lineage of place,

materials, manufacture and, of course, the maker. While preserving the knowledge of a people and conserving the taonga, the practices for each should be linked. The link can be made through the museum portal supporting research analysis, material composition and construction, which can result in the preservation and conservation of people and taonga. I refer here to *Hinemihi o te Ao Tawhito*, the ancestral meeting house of Te Arawa tribe. Upchurch discusses the relevance and acknowledgement of a people and their taonga and how a new perspective within museology, a western governance, in possession of a peoples' material culture is now being realized as an acquisition only rather than the function it should play to connect them (Upchurch 2020, 188).

The practice of biculturalism developed in local museums has taken Māori culture and taonga to a new level of exposure that was not in place prior to the end of the twentieth century. If presented the opportunity to curate an exhibition, I would like to include detailed high-resolution images of weaving with supporting text for weave count, material, and source of dye. Arguably, there are limitations with display space, so in this case it would be best to have fewer items displayed where some of our fragile cloaks occupy all the space if need be. Loss is always expected with the fragile fibres although every measure is taken to prevent this, the greatest loss is for them not to be displayed at all.

I have observed that korowai are not often seen on display, presumably because of the challenges posed by the fragile black fibre. To elucidate indigenous knowledge for museum visitors, korowai should be displayed without compromising their inherent poor condition. Rather, best efforts should be made to support the cloaks. This would mean in most cases that they would not be displayed on mannequins but supported flat with the option of displaying on a slight angle or laid flat in storage. In such cases a description could explain the condition of the korowai and provide information about the degradation of black fibres, that nearly all early kākahu have, caused by the iron-tannate colouration process.

Through my experience of working with tangata whenua, I have found that their gratitude, and sometimes tears, for the means of support and protection of their taonga with archival materials is truly rewarding for all involved. This can be a model for museum conservation in the future. On a reciprocal note, I would be very grateful to see contemporary practitioners procure materials and process them using the traditional methods with tools such as a gourd, oko with volcanic rocks heated and added to the water collected from their

ancestral awa, in the tribal lands settled by their ancestors. Not only am I grateful for this knowledge as a Māori weaver but also as a conservator by adding to the body of information for the mātauranga and stabilization of the taonga.

## Glossary

Aho	Weft thread
Ahopoka	Bias of weft rows
Aotearoa	New Zealand
Ara	Spacing between weft rows or pathway
Aramoana	Tāniko pattern in a series of zigzag lines representing the ocean
Aronui	A superior cloak with deep tāniko border
Awa	River
Atua	God
Hanahana	Garment smeared with red ochre
Harakeke	<i>Phormium tenax</i> , New Zealand flax
Haro	Extracting fibres with mussel shell
Hapū	Subtribe
Hukahuka	Black plied decorative thrums
Hīnau	<i>Elaeocarpus dentatus</i> , a tall tree, the bark of which produces mordanting tannins
Kahikatea	<i>Dacrycarpus dacrydioides</i>
Kahu kurī	A cloak woven with strips or tassels of dog skin or fur
Kahu huruhuru	A feather cloak
Kahutoi	Black cloak made with tī kōuka ( <i>Cordyline Australis</i> )
Kākahu	Garment, cloak
Kaikarakia	Priest or person of prayer
Kaitaka	Cloak with an ornamental tāniko (border), but no further adornment on its main body
Kaitaka huaki	Cloak with double tāniko borders
Kaitaka paepaeroa	Kaitaka, but with vertical weft rows, no adornment
Kaitiaki	Guardian
Kaitiakitanga	Guardianship
Kānuka	<i>Kunzea ericoides</i>

Karakia	Prayer, incantation
Karure	Black thrums unravelled, a decoration of the korowai
Kaumātua	Elderly man or woman
Kaupapa	The foundation or main body of a cloak
Kawakawa	<i>Macropiper excelsum</i>
Kete	Basket
Kiekie	<i>Freycinetia banksii</i>
Kohunga	Variety of harakeke
Kohi	A dark mud used for dyeing fibres black
Korowai	Cloak adorned with black plied thrums
Korowai Ngore	A cloak adorned with black thrums and red pompoms
Ko wai koe?	Who are you?
Kuia	Elderly woman
Kūpapa	Māori who fought with Europeans in the New Zealand wars
Kurupatu	Collar
Kurī	Polynesian dog now extinct
Iwi	Tribe
Māori	Indigenous people of Aotearoa/New Zealand
Māoritanga	Māori culture and identity
Mana	Pride, respect, power, authority
Mānuka	<i>Leptospermum scoparium</i>
Maramataka	Study of lunar forces, used in horticulture
Maunga	Mountain
Mātauranga Māori	Body of Māori knowledge, world view, perspectives, and cultural practices
Miro	Plying fibres into a thread
Mōteatea	Old tradition of chanted song-poetry
Muka	fibre of harakeke
Ngahere	Forest



Ngutunui	Variety of harakeke
Oko	Wooden container
Oriori	lullaby
Pā	Fortified refuge or settlement.
Pake	Cape of leaf elements
Pākehā	European New Zealander
Pango	Black
Papatūānuku	Mother earth
Paru	Mud rich in iron, used for dyeing the muka
Pātikitiki	Flat fish
Pauku	Closely woven cloak, used as armour
Pehipehi	Cloak adorned with leaf strips
Pepeha	Individual genealogy
Piupiu	Waist garment made with cylindrical lengths of leaves with sections of dyed black fibre
Pīngao	Golden sand sedge
Pokapoka	<i>Elaeocarpus hookerianus</i>
Pōkinikini	The cylindrical lengths of a piupiu
Poi	Padded ball at the end of a length of string
Pou	Upright carving
Potae	Hat
Pōwhiri	Ceremony of welcome
Pūtahi	Bound strips of kuri attached to a corner of kākahu
Raranga	Plaited harakeke leaf elements
Rangatira	Men of status
Ranginui	Sky Father
Rāpaki	Waist garment with a woven foundation
Raurekau	<i>Coprosma areolata</i> , tree whose bark is used to produce the yellow colour for dyeing the muka
Repo	Swamp, wetland

Rohe	Region
Rua	Two
Ruhia	Daughter of Tāne Māhuta
Tāhuhu	First woven weft
Tahi	One or first
Tāne Māhuta	God of the forest
Tangata whenua	People of the land
Tangihanga	Funeral
Tānekaha	<i>Phyllocladus trichomanoides</i> , the bark is used to produce the brown colour for dyeing the muka
Tāniko	Decorative border of the kaitaka
Taonga	Treasured artefact
Taeore	Variety of harakeke, New Zealand flax
Tātua	Belt
Tawhero	<i>Weinmannia silvicola</i>
Te Ao Māori	The Māori world
Te Ao Mārama	The world of light
Te Taiao	The natural world
Te Kore	The realm of potential being, the void
Te Pō	The realm of complete darkness, the beginning
Tikanga	Protocols, customs, cultural practices
Tī kōuka	<i>Cordyline Australis</i>
Tohunga	Person of priesthood
Toi	<i>Cordyline indivisa</i>
Toi Moko/Kōiwi	Skeletal remains
Tupāpaku	Deceased
Tupuna/tūpuna	Ancestor/ancestors
Tuku iho	Treasures of our ancestors
Tukutuku	Wall panels of lattice work

Tutu	<i>Coriaria arborea</i>
Uri	offspring, descendant
Urupā	Cemetery
Wahine/wāhine	Woman/women, Female/females
Waiata	Song
Wāhi tapu	Sacred land or site
Wairuatanga	The spiritual awareness
Waiwai	Solution of tannins
Whānau	Family
Whakapapa	Genealogy
Whakairo	Carve, figure or sculpt
Whatumai	Weave together
Whare pora	House or space of weaving
Whatu	Twining stitch, also general term for weaving
Whatu aho tahi	Single pair twining stitch
Whatu aho rua	Double pair twining stitch
Whāriki	Floor covering
Whakapapa	Genealogy, lineage, descent, relatedness
Whakatauki	Proverb
Whenu	Warp thread



## Appendices

### Appendix 1

#### Ethics



Title: Reconnecting taonga kākahu Maori textiles to their place or origin, with the application of XRF analysis and Mātuaranga Maori

Researcher: Rangi Te Kanawa, Museum and Heritage Studies, SACR, Victoria University of Wellington.

#### **Information Sheet for participants:**

Tēnā koe

My name is Rangi Te Kanawa. I am a Doctoral student in the Museum and Heritage Studies programme, Victoria University of Wellington. I would like to interview you as part of my research in gathering information for this doctoral study.

#### Research Overview:

This research aims to trace the origins of ‘disconnected’ traditional Māori textiles in museum collections (taonga kākahu) through the traditional black fibres within the textiles, that have been dyed with a mud rich in iron - paru. The black fibres will be analyzed for their elemental composition then compared to paru/mud samples collected from around the country that will also be analyzed for their elements. A positive result of this analysis will link the textiles to their place of origin, therefore restoring their human linkages.

Information relating to the history and activity about the paru site and, if available, material samples, will further support making the link with place of origin. This research has been approved by the Victoria University Human Ethics Committee. Approval number #00000023597

#### Interview and samples:

I would be grateful for your participation, which would involve your consent to be recorded in an interview and if available to supply paru (mud), black fibre e.g. pōkinikini detached from piupiu, hukahuka detached from korowai and harakeke/muka and waiwai/tannin samples. The material samples will help identify specific features of the dyed black muka that are typical to your region and assist in making a connection to traditional taonga.

There are a few basic research questions relating to the history, use, condition and protection of the paru site, but overall the interview will be structured to allow the flow of conversation. The interview will be written up and made available for your review if you wish.

This research is confidential. This means that the researchers named below will be aware of your identity but the research data will be aggregated and your identity will not be disclosed in any reports, presentations, or public documentation. However you should be aware that in small projects your identity might be obvious to others in your community.

At any time during the interview you can stop without giving reason. You may also choose to withdraw from your contribution and the information and samples will be returned to you.

Ngā mihi nui

Student:

Name: Rangituatahi Te Kanawa

[rangituatahi.tekanawa@vuw.ac.nz](mailto:rangituatahi.tekanawa@vuw.ac.nz)

Supervisor:

Name: Dr Conal McCarthy:

Role: Programme director

School: Art History, Classics and  
Religious Studies



## **Reconnecting taonga kākahu to place of origin**

Researcher: Rangi Te Kanawa, Museum and Heritage Studies programme, Victoria University of Wellington.

### **Consent Form**

Please read the information sheet and feel free to ask any questions.

This consent form will be held for 3 years.

#### **Consent to Interview**

- I agree to take part in a recorded interview      Yes      No  
(circle the appropriate answer)

#### **Consent to supply material samples**

- I agree to supply paru samples      Yes      No
- I agree to supply black paru fibre samples      Yes      No
- I agree to supply harakeke/muka samples      Yes      No
- I agree to supply waiwai (tannin) samples      Yes      No

I understand that:

I may withdraw from this study at any point within a year after day of interview and any information that I have provided will be returned to me or destroyed.

The information I have provided will be destroyed after the research is finished.

Any information I provide will be kept confidential to the researcher and the supervisor. I understand that the results will be used for a PhD report and a summary of the results may be used in academic reports and/ or presented at conferences.

I would like a copy of the transcript of my interview      Yes    No

I would like a report of the material samples analysis  
and have added my email address below.      Yes    No

Signature of Participant: \_\_\_\_\_

Name of Participant: \_\_\_\_\_

Date: \_\_\_\_\_      Contact Details: \_\_\_\_\_





**Reconnecting taonga kākahu  
to place of origin**

Researcher: Rangi Te Kanawa, Museum and Heritage Studies programme, Victoria University of Wellington.

**Questionnaire Form**

The following questions are formulated to best ascertain the history and future of the paru site.

Q1. What history and stories are related to the paru site?

Q2. Is the paru site currently being used or will it be a source of blackdye?

Q3. Would you and your family be interested in having the site protected?

Signature of Participant: \_\_\_\_\_

Name of Participant: \_\_\_\_\_

Date: \_\_\_\_\_ Contact Details: \_\_\_\_\_

Ngā mihi nui

Student:

Supervisor:

Name: Rangituatahi Te Kanawa

[rangituatahi.tekanawa@vuw.ac.nz](mailto:rangituatahi.tekanawa@vuw.ac.nz)

Name: Dr Conal McCarthy

Role: Programme director

Email: [Conal.mccarthy@vuw.ac.nz](mailto:Conal.mccarthy@vuw.ac.nz)

## **Appendix II**

### **New Zealand Conservators of Cultural Materials**

#### **Code of Ethics**

##### **1.0 Purpose**

The Code of Ethics provides a standard for the professional conduct of a conservator of cultural property. This standard enables conservators, their colleagues and the public to appreciate the professional characteristics of conservators and recognise the ethical priorities of their work. It also allows the professional organisation to regulate the conduct of its members, since violation of the Code can lead to revocation of membership.

##### **2.0 Definition of Terms**

###### **2.1 Cultural Property**

All objects which have aesthetic, archaeological, historic, scientific, technological, social or spiritual value for any generation.

###### **2.2 Conservation**

All actions taken to recognise, prevent and retard the loss or deterioration of cultural property.

###### **2.3 Preventive Conservation**

Measures taken to retard deterioration of cultural property and protect it from damage. It is concerned in particular with control of the environment surrounding an object in use, handling, storage, transport or display.

###### **2.4 Conservation Treatment**

Action taken to retard deterioration and prevent damage to objects by treatment of their structure in order to maintain them as nearly as possible in an unchanging state, subject to the further requirements of restoration.

## 2.5 Restoration

Treatment to make the cultural significance of a deteriorated object understandable. This may involve modification of the object.

## 3.0 The Conservator

### 3.1 Professional Limitations

Conservators must recognise the limits of their professional competence and of the facilities and equipment available to them.

### 3.2 Professional Development

Every conservator is obligated to remain aware of technical developments in the profession and should strive to improve his or her knowledge and skills.

### 3.3 Technical Disclosure

There must be no secrecy about any techniques or materials used in conservation, particularly amongst members of the profession.

### 3.4 Conflicts of Interest

No conservator should knowingly enter into contractual or other working arrangements or agreements which place the conservator in a position of a conflict of interest.

## 4.0 The Conservator and the Object

The first responsibility of the conservator is to the object and to its long-term preservation.

Conservation is the means by which the true nature of an object is preserved. The true nature of an object includes evidence of its origins, its original construction and materials, information as to the technology used in its manufacture, and the cultural significance of the object. Subsequent modifications may be of such a significant nature that they should be preserved.

Māori customary concepts empower particular knowledge of heritage and conservation values to chosen guardians, with respect to particular places and artefacts. In adhering to this Code of Ethics all members of NZCCM shall recognise the special relationship of Māori to places and artefacts as described in the Treaty of Waitangi.

In order to protect the true nature of an object, certain principles should be observed in its care and maintenance.

#### 4.1 Conservation Standards

Although the level of expertise and experience may vary from conservator to conservator, the quality of work regardless of the value of the object must always be of the highest possible standard and within the capability of the conservator.

#### 4.2 Technical Examination and Documentation

Before carrying out any treatment, the conservator should make an examination of the object and all available documentation in order to determine its condition, stability, history, cultural significance and the causes of its deterioration. The results of this examination and of any subsequent treatment must be held as a permanent archival record.

Conservators should not promulgate false or misleading information relating to objects being examined or treated.

#### 4.3 Extent of Treatment and Reversibility

Preventive conservation such as an improvement in conditions of use, display or storage is preferable to physical intervention. Before intervention, its necessity must be firmly established.

### 5.0 Professional Relationships

#### 5.1 Owners and Custodians

The opinions, wishes and views of the owner, custodian or other responsible person must be fully acknowledged and considered when discussing a proposal for conservation. In so much as an owner or custodian is unable to judge the conservation requirements of the object, the conservator should honestly and sincerely advise what is considered the best course of treatment. The final decision as to the best course of action, however, lies with the owner or custodian.

If the owner or custodian requires a conservator to carry out a treatment or procedure which the conservator considers to be unethical, then the conservator must make every effort to convince the owner or custodian, and if need be bring in other conservators to support the case. Ultimately, the conservator may make the decision not to carry out the work requested, the consequences of which will then have to be considered.

The conservator is also responsible for providing advice on the subsequent care of a treated object, in particular in regard to its handling and requirements for storage, transport and display.

#### 5.2 Artists and Craftspeople

The conservator's professional activities are distinct from those of the artistic or craft professions. A basic criterion of this distinction is that their activities as conservators do not create new cultural objects. Any recommendation as to whether intervention on an

object should be undertaken by an artist or craftsman can be made only by a conservator.

### 5.3 Trainees and Colleagues

Training and instruction in conservation should only be given within the limits of the conservator's knowledge and competence, and the time and facilities available. The rights and objectives of both trainer and trainee should be clearly stated and mutually agreed upon any aspect of the work, then every assistance should be provided in order to obtain these other opinions.

A member should not volunteer adverse judgement on the qualifications of, or the procedures rendered by, another NZCCM member except in discussions. The conservator is directly responsible for all delegated or sub-contract work. This includes work delegated to trainees, volunteers, subordinates or outside agencies. Work should not be delegated unless the conservator can directly supervise it or has sufficient knowledge of the agent.

### 5.4 Conservation

No individual engaged in any form of conservation can hope to be expertly informed on all aspects of examination, analysis and treatment. Where necessary, there should be no hesitation in seeking the advice of other professionals or in referring the owner, custodian or other responsible person to a conservator more experienced in the particular problem. If the owner or custodian wishes to seek other opinions regarding between the conservators concerned, or through the NZCCM. It is appropriate, however, for a conservator to give conservation advice when it is requested by those fearing negligent or unethical practice. All comments thus made should be based on facts of which the conservator has personal knowledge, rather than hearsay. If such comments are warranted, it is best to first discuss the matter directly with those concerned. If it cannot be resolved in this way, then the legitimate means of raising the matter with the conservation profession is through the NZCCM.

[Adopted at the New Zealand Professional Conservators' Group Annual General Meeting held in Auckland, 28 February 1985. Amended 28 April 1995. Amended 19 October 2006 (name change to NZCCM)].

## Appendix III

### National Services Te Paerangi Support Letter

Te Papa Tongarewa Museum of New Zealand

09 o Maehe, 2018

Rangi Te Kanawa  
Māori Textiles Conservator

Ki te hunga mō koutou ēnei kōrero,

He reta tautoko tēnei i a Rangi Te Kanawa, Kaitiaki Kahu Āku, ki Te Papa Tongarewa.

Ko Paora Tibble taku ingoa, ko taku tūranga i konei i Te Papa, he Kaiwhanake ā-Iwi. I takea mai tēnei mahi i te ture whakatū i Te Papa, otirā, hei whakatutuki i te Mana Taonga, te kaupapa here i whakataukitia ai e Ngā Kaiwawao, e Āpirana Mahuika mā.

Kāti, ka huri ki te uri o Ngāti Kinohaku, o Ngāti Rora, o Ngāti Uekaha, o Ngāti Maniapoto. Ko ia te mokopuna a Rangimārie Hetet, ko ia te tamāhine a Diggeress Te Kanawa, ko ia tēnei ko Rangituatahi Te Kanawa, ko ia te aho tapu e here nei i Te Papa Tongarewa ki Te Nehenehenui. He ringarehe, he mātanga, he tohunga tiaki i ngā taonga i rarangahia, i whatua e te iwi nui kei te pō.

Kua ono ngā hui māua ko Rangi e mahi ngātahi ana, ko ngā hui tiaki taonga a Te Paerangi. Ia hui, ia hui, ka tū au ki te whaikōrero, ka kī atu ki te haukainga kia mihi mai ki te Ino o Maniapoto. Tāria te wā, ka tū a Rangi ki te kōrero mō āna mahi. Ka taringa areare mai te iwi ki tāna, arā, ka whiria te here i tīmata mai i tana kuia, heke iho ki tana whāea, tae rawa ki a rātau ko tōna reanga. Ko ia te whakatinanatanga o te mana taonga, ahakoa kāre tana reo Māori, he mātauranga Māori ka makere mai i ōna ngutu. He kaitiaki a Rangituatahi nō Te Wharepora a Hineteiwaiwa.

My experience of working with Rangi Te Kanawa over the last fifteen months, has been nothing short of amazing. One of my roles is that of organising workshops, where Rangi gets to share the breadth and depth of mātauranga Māori in her kete. With regards to mana taonga, Rangi enables our people to see their taonga with new eyes. She has seen woven treasures all over the country and worldwide. Rangi has the ability to weave the science with the mātauranga Māori in a way such that our people get it. In my second workshop with Rangi, the punters asked her to present again on the second day because they were so engaged with her kōrero.

I don't believe that we have anyone in the Te Papa staff that is so connected to the taonga, to the kaitiaki, and to mātauranga Māori in the way that Rangi is. Two years ago during the Kāhui Kaitiaki Hui held on Takapūwāhia Mara.....e, Porirua, Rangi gave a

presentation. As MCee, I asked Ngahuia Te Awekotuku to mihi Rangi at the end of the presentation. After her pao, Ngahuia spoke to Rangi's name, citing the fact that it is a type of flax. At the workshop held at the Kōkiri Centre, Te Kōpua Whāingaroa (24<sup>th</sup>-25<sup>th</sup> February 2018), during her presentation, Rangi said, 'Harakeke is in our whakapapa'. For Rangi, this is so true. In her mahi, Rangi weaves our people to their taonga. In her rangahau, Rangi is attempting to connect the taonga back to the land, the paru from whence they came. Rangituatahi Te Kanawa is a manifestation of mana taonga.

Me pēnei nana te kōrero, kāre i kō mai, kāre i kō atu i te Rangituatahi, ko ia te whakatutukitanga o te mana taonga. Ka whakakapi tēnei kōrero āku ki tēnei whakataukī, 'Whakairo tonu ana a Rangimārie.'

Nāku iti nei,

Paora Tibble

Kaiwhanake ā-Iwi, NSTP, Te Papa



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