

NGĀ TOHU

RECLAIMING AND PRESERVING INDIGENOUS KNOWLEDGE OF
COASTAL AND MARINE ECOSYSTEMS



Sustainable Seas National Science Challenge - Tangaroa Programme
Project T3 Nga Tohu o te Ao: Utilising Maramataka as a Framework for
Marine Management

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Utilising Maramataka as a Framework for Marine Management

Te Korowai : Reclaiming Indigenous Knowledge and Practices of
Maramataka

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TE KOROWAI

RECLAIMING INDIGENOUS KNOWLEDGE AND PRACTICES OF MARAMATAKA

The Māori moon calendar or Maramataka is an ancient knowledge system developed over many millennia though an intimate connection with the environment. Maramataka is a natural timekeeping system that utilises the movement of the moon through any given month or season to determine appropriate times for various customary activities. Although maramataka are not as widely applied in today's modern times, the knowledge and practices surrounding moon calendars have been preserved in indigenous communities across and Pacific. Here in Aotearoa maramataka is still applied by indigenous practitioners and it continues to inform interaction with the environment and guide ecosystem management practices. The survival of maramataka throughout time has established it as a recognised instrument for indigenous ecological knowledge (IEK) preservation and reclamation.

Ngā Tohu aims to utilise Maramataka as a tool to explore indigenous ecological knowledge (IEK) of coastal and marine ecosystems. This project is investigating the use of maramataka as a framework for development of culturally responsive marine monitoring knowledge and practice. Ngā Tohu is being developed over three case study areas throughout Aotearoa, these whānau groups include Pākirikiri Wānanga based in Tokomaru Bay, Ngātaki Collective in Ngātaki and Ngā Pāpaka in Tauranga. These whānau groups have set the foundation for collective inquiry into maramataka and IEK.

Indigenous ecological knowledge (IEK) is the result of intimate connections, explorations and interactions with the natural environment and ecosystems. IEK is culminated over many generations and passed down via various modes of cultural transmission. It is directly linked to the lands and seas for which it is developed, and it holds knowledge distinctive and specific to place and people. IEK is a source of invaluable information that continues to inform theory and practice around coastal ecosystem protection and management. Ngā Tohu aims to reclaim IEK to inform and enhance maramataka practice in coastal management, and although the broader project looks to three levels of IEK reclamation, 1) IEK of the Pacific, 2) mātauranga Māori (MM) and 3) tribal ecological knowledge (TEK), this report will focus more specifically on the latter two. It is important to note here that IEK reclaimed in this program will not be presented in full in this report, instead this report will describe the framework and processes used in the Ngā Tohu program to reclaim IEK regarding maramataka theory and practice. This report has three sections, they are:

TE KOROWAI *Cloak* - Positioning of the framework

TE RĀKAU *Tree* - Framework structure

NGĀ PEKA *Branches* - Exemplar of framework application



TE KOROWAI

The foundations Positioning of the framework

It is important for Ngā Tohu to describe the research process from a Te Ao Māori perspective, and as such, we have chosen to structure this report using the story of Te Korowai o Papatuānuku (the cloak of Papatuānuku, also referred to throughout the report as Te Korowai o Papa and Te Korowai). Te Korowai is a narrative that helps to describe the research process we have undertaken in Ngā Tohu.

Te Korowai speaks to reclaiming the seeds of indigenous ecological knowledge and positions the knowledge reclamation process within traditional pūrākau (traditional Māori stories). Pūrākau articulately describe the creation of our living world and detail key stages. One of particular significance to the development and positioning of this framework is Te Korowai o Papatuānuku, the creation of the indigenous forests.

It is important to acknowledge here, that traditional creation stories will differ tribally, this report will therefore present a general narrative of the fundamental concepts within the pūrākau of the creation of forests.

Te Korowai follows a common narrative of indigenous forests, from the creation of forests, and their pre-human state, to widespread forest clearing and finally to the current phase of active forest restoration.

Te Timatanga

Creation of Te Korowai ō Papatuānuku

The pūrākau of Te Korowai ō Papatuānuku tells us that after the separation of Papatuānuku (earth) and Ranginui (sky), Papatuānuku was left lying unclothed, bare, and barren. Out of pure aroha (love), Ranginui instructed his son Tāne Mahuta (guardian of the forests) to cover Papatuānuku. Tāne set to this task, sowing the seeds of his children within the fertile soils of his mother. The first of his children being rākau, the trees. Over time these rākau grew creating safe spaces for other life to exist and flourish, and because of this our forest systems were created, Te Korowai ō Papatuānuku, the cloak of Papatuānuku.

Prior to the arrival of man, Aotearoa was covered in thick native forests. Each forest different and unique, teeming with a diversity of life, a complete myriad of balanced interconnected self-supporting systems and energies. Each organism in the forest serving a vital role in the whole system. Every part of the forest, living or non-living held the potential of a knowledge system.

With the arrival of man, overtime the potential of knowledge held in the forests was realised. Over generations of lived interactions and experiences, IEK of the indigenous forests grew and developed. Through acute environmental observation skills Māori quickly developed understandings of individual species, and their connection and relationship with the whole system. Like the stitching of a korowai, IEK wove together the knowledge held within the energy flows of the forest.

Te Tuakanga

Clearing of indigenous forests

The forests of Aotearoa depict a story not dissimilar to other indigenous forests of the world. With the arrival of man, the indigenous forests of Aotearoa have experienced a history of deliberate and intentional clearing.

On reflection of the traditional Māori histories, Tāne clothed his mother Papatuānuku with forest, a life-giving korowai. Over generations of human occupation, piece by piece, her korowai of protection has been removed, and today again Papatuānuku lies bare,

barren, and exposed. With her cloak removed, she no longer has the same strength and resilience, and today we see a land that struggles to support the delicate life systems of the world.

The clearing of indigenous forest has been used here as a metaphorical reference to position the clearing of indigenous knowledge systems. Indigenous Māori knowledge systems once diverse and resilient have experienced a similar process of clearing to that of our indigenous forest systems of Aotearoa. Like the Korowai ō Papatuānuku, the indigenous knowledge systems are but remnants of their former state, and today we actively seek to reclaim and preserve, the seeds of knowledge, and harness the potential still held in the land and people.

Te Pitomata

Restoration of indigenous forest

In more recent history, we have come to realise the consequences of forest clearing and land modification to both our local and global environmental systems. Because of this there has been a conscious movement toward protecting and restoring indigenous forests, across Aotearoa.

Restoration of indigenous forest has been used in the Ngā Tohu project to position the reclamation of indigenous knowledge. Te Korowai ō Papatuānuku looks at the principles and process of forest restoration as the basis for guiding indigenous knowledge reclamation.

Again, if we reflect on the teachings of the pūrākau, Te Korowai ō Papatuānuku. Tāne clothed his mother's bare body with rākau. Rākau were the first of his children to be established and as a result the multitudes of forest life were housed, and interconnected systems of service within the forests were established.

Te Korowai looks to restore the rākau of knowledge, through reclaiming the seeds of indigenous knowledge. Each rākau is a source of knowledge, and as we reclaim the seeds, we plant and care for their growth. As we observe the growth, we gain a deeper connection and understanding of them, and their sacred place in Taiao (the natural environment). We observe how the rākau connects and interacts with the whole, and from this we understand our connection and our place in Taiao. It is from this place of knowing that we are able to more effectively act as kaitiaki (guardians) of our land, sky and water.



TE RĀKAU

Framework Structure

Te Korowai tells us that rākau are the foundations of our forests. If we are to restore the forests of knowledge, then the first strands must be the rākau of knowledge. In the Ngā Tohu project the rākau of knowledge are the foundational knowledge systems that make up the maramataka. The rākau are core knowledge components, that once established will support the growth and development of the whole knowledge system. Although broad in definition, it is important to acknowledge that each whānau within the project will determine what rākau/knowledge components are important, relevant, and meaningful to their forest restoration. Although, this report will not detail knowledge held within the rākau, it will describe the framework, and process of knowledge exploration as it is positioned within the broader context of Te Korowai.

As a restorative framework, Te Korowai is framed into four stages of forest restoration, 1) Kākano, 2) Pihi, 3) Whakatō, and 4) Tiaki. These stages provide the progressive action points that guide the broader restorative aspirations of Te Korowai.

In the development of Te Korowai, we looked to karakia for guidance. Karakia are Māori knowledge systems that hold detailed descriptions of the intricate stitching of the natural physical world to the spiritual. Although there are many different types of karakia used for different purposes, Ngā Tohu explored karakia as a source of knowledge, that would give us detailed descriptives of cause-and-effect processes in the natural world. Ko Te Pū is a karakia widely used in relation to different aspects of growth, development, and creation. Of particular importance to this project, Ko Te Pū lists the transitional sequences of growth and development of rākau, from the germination of seed through to the realisation of reproductive potential. This karakia has been used to guide the exploration of the key stages of restoration of Te Korowai, as a metaphor for the reclamation of IEK regarding maramataka knowledge.



KĀKANO

Reclaiming seeds

Find reliable seed stock
Source seed at appropriate times of the year

PIHI

Growing seedlings

Plant the seeds. Keep them safe and protected throughout germination so that they may establish strong roots, strong upward sprouts and strong head growth



Developing forests receive ongoing maintenance and secondary planting is done accordingly

Caring into the future

TIAKI

Once rākau are strong enough they are planted out. Rākau are selected based on suitability to site. Site is prepared appropriately and rākau are planted during the most suitable time of year

Planting out seedlings

WHAKATŌ

To date Ngā Tohu has focused its efforts on the first two stages of Te Korowai
1) Kākano, and 2) Pihi. A description of each stage is given here.

Kākano Pihi

Reclaiming seeds

Kākano (seeds of knowledge) provide the foundation by which further exploration and development of maramataka knowledge can occur. Depending on the aspirations of each whānau group, the form, function, and reclamation pathways of Kākano will differ. It is important that whānau are able to identify Kākano that are beneficial to their reclamation journey. The reclamation of Kākano in this project has been guided by a series of pātai (questions) that have helped to provide focus and direction in the initial stages of Kākano exploration.

Ka kimi i te aha?
What seeds are we looking for?

Ki hea kimi ai?
Where do we find the seeds?

He aha tōna momo?
What do seeds look like?

Hei āhea kimi ai?
When is the appropriate time to collect the seeds?

Growing seedlings

Pihi (Seedling) is about planting the kākano (seeds of knowledge). Grounding them in safe spaces and collectively nurturing so that they may develop strong established roots. Hui (noho and wānanga - meetings and cultural gatherings) have been valuable in providing the space for establishing and grounding the knowledge development process. These cultural spaces acknowledge and uphold traditional Māori values and practices, allowing for safe exploration of knowledge reclamation. Hui has fostered an openness of sharing and learning, both within the Ngā Tohu whānau and the extended whānau/pūkenga (expert practitioners). Hui have enabled ongoing progressive inquiry into maramataka, whereby each hui, provides a platform on which another layer of knowledge can be added, strengthening the positioning and understanding of the whole.

"Because it is part of our culture, it is our special and unique time keeping system, that has been developed over generations of lived experiences, and handed down. Reclamation of time is a form of decolonisation, we reclaim our time systems, we reclaim our indigenous knowledge of time and space, we know where we are, and we can decide where we want to go, its super empowering"



Pihi

*Growing seedlings
Exploring the potential within*

To date Ngā Tohu has been working in two main areas of Pihi - Te More and Te Weu as described here.

TE MORE

Grounding potential
*Establishing
anchorage and
grounding*



Tōna ingoa:
Exploration of word



Tōna whakapapa:
Exploration of
whakapapa

TE WEU

Resourcing potential
*Searching for
nourishment*



Ōna kōrero:
Exploration of
traditional stories

TE AKA

**Stretching toward
potential**
Stretching upward



Ōna Tohu:
Exploration of
physical expression



Tōna ingoa:

What is their name?

What can their name tell us about their natural process and characteristics?

Ingoa (Māori names) provide a cultural description of observations, processes, activities, events, experience, qualities, traits, and characteristics. Ingoa are a unique source of IEK which can give us an insight into the natural characteristics and process of Taiao.

Tōna whakapapa:

What is their whakapapa?

What are their relationships and connections to the wider environmental systems and what can this tell us?

Whakapapa maps out connections and relationships of the natural world, based on localised knowledge and understandings of Taiao. Whakapapa holds an extremely useful system of IEK relating to the interconnections, and interdependencies of Taiao.

Ōna kōrero:

What is their story?

What can traditional Māori stories tell us about their broader processes and relationships with the environment?

Traditional oral histories are housed in many forms, eg. pūrākau, karakia, whakairo, waiata and many more. These are unique forms of cultural expressions of knowledge, observations and interpretations of the natural world.

Ōna Tohu:

What is their expression?

What are their physical expression and how can we observe and track?

Tohu are the physical expression of a system of interacting processes. Tohu track the transitions of natural cycles and processes and provide us with time markers to understand where we are in the cycles of life.

NGĀ PEKA

IEK Reclamation Process

Continuing the analogy of the rākau growth, once you have a strong tree trunk, the crown of the tree, its branches and leaves will develop. This part of the report demonstrates an example of different peka (elements, branches) of maramataka explored and the process we have applied to begin to reclaim Te Korowai o Papa with regard to maramataka knowledge and its application. This looks at parts of the Ko Te Pu karakia for knowledge growth, and in particular Te Pu (the words and names), Te More (the whakapapa), Te Weu (the kōrero associated), and Te Aka (the tohu or environmental indicators) that are a part of maramataka.

Ngā Peka draws together the core components of the maramataka (Tamanuiterā, Whetū, Marama, Kaupeka, Wai) into a working system that whānau in the Ngā Tohu project have used to reclaim and restore their tribal knowledge systems around maramataka.

Ngā Peka has been designed specifically as a simple interactive tool that acknowledges localised maramataka and enables the development of practice over time. Ngā Peka comprises of a base layer coupled with a series of moving and adjustable dials of various sizes. The base layer provides the platform for recording constants within the maramataka system, specifically Tamanuiterā and Whetū. The adjustable dials are designed to capture the variable environmental process and indicators that relate to Papatuānuku and Wai. Each dial can be layered on top of each other as knowledge is gathered, the dials are movable which allows users to explore relationships and interactions between the different dial layers. The information presented here is a sample of how Ngā Peka has been applied to support application of Te Korowai.

Tamanuiterā *Sun*



Ngā Whetū *Stars*



Kaupeka *Months*



Marama *Moons*



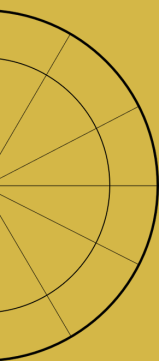
Wai *Water*





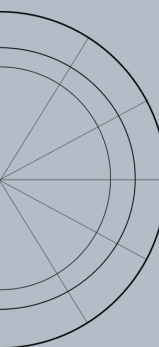
Tamanuiterā is positioned on the base layer, and provides a reference point for the other components of the tool to build on. Tamanuiterā sits in the centre and guides the annual seasons.

What are the names of the seasons of the year?
What do the names mean?
What is their whakapapa?
What is their kōrero?
What is their tohu?



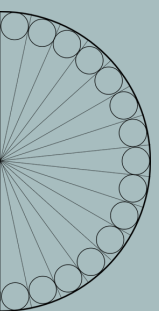
Whetū are positioned on the base layer. This layer is used to record the names of the lunar months related to the position of stars. In some maramataka each lunar cycle is marked by a star. These stars can help to track the earth positioning in the annual cycle of the sun.

What are the names of the whetū used to mark the kaupeka o te tau?
What do the names mean?
What is their whakapapa?
What is their kōrero?
What is their tohu?



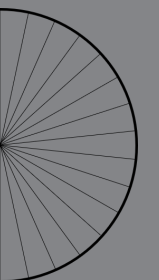
Kaupeka make up the different layers of adjustable dials. These dials are used to record the names of the lunar months in accordance with environmental processes. Kaupeka look deeper into environmental process that link to a particular period of the year.

What are the names of the kaupeka o te tau?
What do the names mean?
What is their whakapapa?
What is their kōrero?
What is their tohu?



Marama are another layer of smaller adjustable dials. These dials are used to record the names of the moon phases. The phases of the moon tell us where we are in the monthly lunar cycle. The combination of moon and star can give us a more specific time reference to the earths positioning along the annual cycle.

What are the names of the marama phases?
What do the names mean?
What is their whakapapa?
What is their kōrero?
What is their tohu?



Tohu are another layer of adjustable dials used to track the processes of different indicators over the annual cycle. The dials can be aligned to build a more comprehensive understanding of the relationships between different tohu cycles.

What are the names of the Tohu?
What do the names mean?
What is their whakapapa?
What is their kōrero?
What is their tohu?

Tōna ingoa

Tōna whakapapa

Hineraumati Hinetakurua

Hineraumati is the summer maiden and Hinetakurua is the winter maiden.

Hineraumati and Hinetakurua are the wives of Tamanuiterā. Tamanuiterā moves between the two wives during his annual cycle.

Rehua

The meaning of the name of this star is under investigation.

Rehua is a son of Rangi and Papa. Two of his wives, Ruhiterangi and Ruhanui are associated with the heat of summer.

Tikākā muturangi

Tikākā meaning to be burnt by the sun. Muturangi refers to the end of a phase. Together Tikākā muturangi speaks to a phase of time whereby the heat of summer has receded.

The whakapapa of this kaupeka is under investigation.

Otāne

The name Otāne relates to Tāne Mahuta (Guardian of forest)

Tāne is one of the eldest sons of Rangi and Papa.

Tāwhirirangi

The name Tāwhiri relates to Tāwhirimātea, a well known god of the winds.

Tāwhirirangi is a son of Papa and Rangi.

Ōna kōrero

Hineraumati sits in the south and is observed when Tamanuiterā rises at his most southern point along the eastern horizon. This is the longest day and shortest night.

There are many pūrākau related to the activities of Rehua some examples include - Te Putahi nui a Rehua, Nga manu a Rehua.

The korero of this kaupeka is still under investigation

There are many pūrākau related to the activities of Tāne, some examples include Te Wehenga (The separation of sky and earth) and Ngā kete o te wānanga (Baskets of knowledge)

The korero of Tāwhirirangi is still under investigation

Ōna Tohu

Hinetakurua sits in the north and is observed when Tamanuiterā rises at his most northern point along the eastern horizon. This is the shortest day and longest night.

Rehua is the brightest star in Te Matau a Maui (Scorpius constellation) he is associated with summer.

After the heat of the year has passed, and the colder weather is setting in. Tīkākā muturangi is said to align with the star Paeagawhāwhā

Otāne is a waning crescent moon phase observed at sun rise.

Tāwhirirangi is associated with the high jet winds. When the Kuaka migrate they use the wind of Tāwhirirangi.





*Marotiri Maunga
Tokomaru Bay*

ME AHU PEHEA? WHERE TO FROM HERE?

This report presents Te Korowai, a framework used to guide IEK reclamation in the Ngā Tohu project. It describes the first two stages of the framework in detail (Kākano and Whakaparahia) and provides examples of its practical application through the use of the Ngā Peka resource. Ngā Tohu will continue to develop over the next two years, and will focus on the final stages of Te Korowai - Whakaparahia, Whakatō, and Tiaki

We humbly acknowledge each of the Ngā Tohu case study groups - Pākirikiri Wānanga, Ngātaki Whanau Collective, Ngā Pāpaka, for their continued commitment and dedication to the project. It has been privilege and honour to be able present theses collective learnings on behalf of the Nga Tohu project. Mauri Ora.



*Waitahora
Te Hiku*



*Raropua
Tauranga Moana*