

New Zealand's Biological Heritage National Science Challenge NRT Oranga – Annual Workplan

Title

Short Title: Mauri Ora

Long Title: Te mauri o te rākau, te mauri o te ngahere, te mauri o te tangata

Contract Ref: TBC

Short Statement

Aotearoa New Zealand is facing wicked conservation and biosecurity problems including kauri dieback and myrtle rust. Current approaches have failed to produce the anticipated biodiversity and biosecurity gains needed to protect our taonga. Fortunately, we have a secret weapon here in Aotearoa New Zealand and that is the knowledge of our indigenous peoples (Māori). Māori have been calling for solutions that draw on their knowledge systems and understanding of the physical and meta-physical elements of the universe to be considered and resourced in the management of their forests and lands.

Mauri Ora, is a suite of kaupapa Māori projects¹ that aim to restore the collective health of trees, forests and people, by connecting to and resourcing Māori communities and their environmental knowledge holders to explore solutions embedded in mātauranga Māori (Māori knowledge). These projects are grounded in indigenous knowledge and practices, and will collectively show how mātauranga-led research can contribute to addressing contemporary biosecurity issues while integrating the aspirations of Māori and their communities, and strengthening and sustaining valuable knowledge structures.

Executive Summary

Aotearoa New Zealand faces unprecedented conservation and biosecurity pressure from a world that is becoming increasingly smaller and interconnected. Threats, such as kauri dieback and myrtle rust, are unparalleled and current approaches, and their underlying philosophies, have failed to produce the anticipated biodiversity and biosecurity gains needed to protect our taonga². There is an urgent requirement for new methodologies that will augment existing conservation approaches, and in some instances, create new grassroots based solutions to address these and many other biosecurity issues.

In the fight against kauri dieback and myrtle rust, Māori have been calling for solutions that draw on their knowledge systems and understanding of the physical and meta-physical elements of the universe found in Te Ao Māori (the Māori world/worldview). This includes solutions embedded in the spiritual dimensions of this body of knowledge that are vital to the protection and enhancement of the natural environment and are often overlooked, or at worst subjugated, by conventional environmental management practices and western science knowledge that underpins its decision-making.

A suite of mātauranga-based projects has been selected for investment and is collectively known as '**mauri ora**'. The projects all aim to restore the collective health of trees, forests and people, by connecting to and resourcing Māori communities and their environmental knowledge holders to help strengthen and sustain valuable knowledge constructs by exploring mātauranga Māori solutions to myrtle rust and kauri dieback. They will collectively show how mātauranga-led research can contribute to contemporary biosecurity issues while addressing the aspirations and cultural considerations of Māori and their communities. The first year will be focussed on a mixture of research delivery where Māori have been clear about the research needed or prior research has been undertaken (i.e. RA1, RA2 & RA4) and scoping needs and aspirations where there is still uncertainty about the communities exact needs or wants (RA3) to develop detailed research plans that will be implemented in Year 2 and Year 3.

All projects adhere to strict protocols, negotiated with mana whenua, that protect the knowledge holders and communities who participate. Te Tiriti o Waitangi, relevant Waitangi Tribunal reports/findings and Indigenous Declarations (i.e. UNDRIP & Mataatua Declaration), and Kaupapa Māori methodologies will underpin all of the research. Additionally, a rōpū of kaumātua (elders), tohunga (experts) and knowledge holders will guide, support and protect researchers as is tika (right and appropriate).

This suite of projects is unashamedly indigenous, its focus is the protection of te taiao (the environment). Unfortunately, previous research programmes have neglected to involve Māori in key areas that utilise their immense wealth of knowledge

¹ Privacy of natural persons describes Kaupapa Māori as 'a Māori way' - a philosophical doctrine, incorporating knowledge skills, attitudes, and values of Māori society (a Māori approach, Māori topic, Māori customary practice, Māori institution, Māori agenda, Māori principles, Māori ideology).

² Treasured possession, including natural resource.

about the environment they are Kaitiaki (guardians, protectors) of. These approaches have also failed to produce the anticipated biodiversity and biosecurity gains needed to protect our taonga. Fortunately, our “secret weapon” in this programme will be the indigenous people of Aotearoa New Zealand and the unleashing of their mātauranga on the research community. Māori have been calling for solutions that draw on their knowledge systems and understanding of the physical and meta-physical elements of the universe to be considered and resourced. We are going to provide that opportunity.

Project Team

The following are the leaders and managers for the overall programme and sub-projects.

Person	Organisation	Role/Responsibility/Capability
Programme Leaders		
Privacy of natural persons	AUT (Ngāpuhi, Waikato, Ngāti Haina, Ngāti Pākehā)	RA2 Lead Social Scientist: Waiata, kapahaka & Reo Māori; mātauranga Māori – kaitiakitanga, well-being, biodiversity/agroecology
Melanie Mark-Shadbolt	Te Tira Whakamātaki (Ngāti Kahungunu ki Wairarapa, Ngāti Porou, Te Arawa, Ngāti Raukawa, Te Atiawa)	Project Co-Lead Social scientist: indigenous engagement & relationships; human dimensions of environmental health; political science; DRR; biodiversity management; Māori indigenous advancement and sustainable development (links to project 1.1 in T1)
He Putunga Kōrero – He Puna Mātauranga (Kaumātua Governance)		
Kevin Prime	Ngāti Hine, Ngāti Whatua, Tainui	Governance / Guidance Knowledge holder/kaumātua: Reo, Tikanga, Mātauranga – biodiversity, karakia (links to project 1.1 in T1)
Privacy of natural persons	Ngāti Hine, Ngā Puhi	Governance / Guidance Knowledge holder/kaumātua: Reo, Tikanga, Mātauranga – rongoā (links to project 1.1 in T1)
9(2)(a)	Tūhoe Tuawhenua	Governance / Guidance Knowledge holder/kaumātua: Reo, Tikanga, Mātauranga – biodiversity (links to project 1.1 in T1)
9(2)(a)	Tūhoe, Ngāti Ruapani	Governance / Guidance Knowledge holder/kaumātua: Reo, Tikanga, Mātauranga – karakia, waiata (links to project 1.1 in T1)
We may also lean on the wider Te Tira Whakamātaki Kāhui which includes the above and Glenice Paine, Privacy of natural persons 9(2)(a), 9(2)(a).		
RA 1: Te Whakaora a Ngā Kauri: Rongoā Solutions for Kauri Dieback		
Project one – rongoā-expert lead, Māori researcher supported:		
Privacy of natural persons	Ngāti Hine	RA1 Co-lead – Rongoā expert See above
Privacy of natural persons	Independent (Rongomaiwahine, Ngāti Kahungunu, Ngāti Tūwharetoa)	RA1 Co-lead – Māori researcher Ecotoxicologist: Mātauranga Māori, environmental management, sustainable development, Māori education, engagement, reo me tikanga, kauri dieback (links to project 1.1 in T1)

Project two – Post-Doc lead, Māori researcher supervised		
9(2)(a)	University of Waikato	RA1 Co-lead – Post-Doc
Privacy of natural persons	University of Waikato (Waikato – Ngāti Whāwhakia)	RA1 Co-lead – Research Fellow (Māori academic) Molecular biologist: rongoā rākau, preserving mātauranga Māori, kaupapa-Māori methodology; Māori community engagement
RA2: Te reo o te waonui a Tāne (The language of the domain of Tāne)		
Privacy of natural persons	AUT See above	RA2 Lead See above
TBC		
RA 3: Hapū Solutions for Myrtle Rust		
Privacy of natural persons	Te Tira Whakamātaki (Ngāto Ranginui, Ngai Te Rangī, Ngā Puhī, Ngāti Hine, Te Rarawa)	RA3 Lead Māori relationship manager: stakeholder management; engagement modeller; biosecurity; plant protection; myrtle rust (links to project 2.4 in T1)
9(2)(a)	Te Tira Whakamātaki (Te Arawa: Ngāti Tarāwhai, Ngāti Pikiao, Ngāti Ngararanui, Ngāti Whakaue)	Project Co-lead Biosecurity/pest manager: Biosecurity; pest management; marine; Māori engagement; reo Māori me tikanga Māori; Māori development and advancement
RA 4: Te Mana Motuhake a Ngā Kāhano: The Sovereignty of Seeds		
Melanie Mark-Shadbolt	Te Tira Whakamātaki See above	RA4 Co-lead See above
Privacy of natural persons	Independent (Ngāti Porou, Ngāti Awa)	RA4 Co-lead Political scientist: Māori / indigenous cultural and intellectual property issue; Wai262 specialist; Māori representation and engagement in international processes; indigenous perspectives on biotechnology, bioethics, synthetic biology, gene-editing; Māori indigenous advancement and sustainable development
RA 5: The Critical Friend		
Privacy of natural persons	Forest Research UK	RA5 Co-lead Social Anthropologist: sustainable forestry; tree health; recreational values of forests; perceptions and understanding of risk; development and social change; human-wildlife conflicts; environmental volunteering
Privacy of natural persons (TBC)	University of Saskatchewan (Tūhoe, Ngāti Ruapani)	RA5 Co-lead Economic Geographer: disaster risk reduction for indigenous communities; indigenous planning and development; small-scale indigenous horticulture; assessment of environmental vulnerability
Project Support		
9(2)(a)	Te Tira Whakamātaki (Ngāpuhi)	Project administration & support
9(2)(a)	Te Tira Whakamātaki	Communications & engagement
9(2)(a)	Te Tira Whakamātaki (Ngāti Porou)	Kaumtua and kaitiaki support

Ngā Rākau Taketake Collaborations:

Group/Person	Nature of connection	Established/ Potential	Team member(s) responsible	RAs	Status (for established connections), and Aim/plans for the coming year (2019/20/21)
NRT 4 Conservation & Restoration	Joint seed conservation programme	Established	Melanie Mark- Shadbolt, Privacy of natural persons	5	Established Align work programmes, collaborate on wānanga, share information and intel, co-investment
NRT 7 Tools for Detection & Management	Joint rongoā / bioactives programme	Potential	Privacy of natural persons	1	Established Ongoing discussions about potentially aligning our work programmes and coinvesting in work
NRT 3 Integrated Surveillance Framework	Alignment with hapū based myrtle rust work	Potential	Privacy of natural persons	3	Established Ongoing discussions about potentially aligned work programmes
NRT 2-7	Integrated Māori Plan	Potential	Melanie Mark- Shadbolt, Privacy of natural persons	All	Established Plan developed but subject to approval by NRT and investment from NRT themes

Domestic collaboration:

Group/Person	Nature of connection	Established/ Potential	Team member responsible	RAs	Status (for established connections), and Aim/plans for the coming year (2019/20/21)
BioH SLG Privacy of natural persons	Provide guidance within the context of the larger NRT programme, and connections to relevant communities	Established (<i>subcontract not required</i>)	Privacy of natural persons	All	Open Ongoing guidance and support
Kauri Dieback Tangata Whenua Rōpū	Alignment and support, access to sites, people, mātauranga, ensure we are meeting their aspirations	Established (<i>subcontracts maybe required</i>)	Privacy of natural persons	1,2,4 & 5	Open Engage regularly and directly to ensure transparency and knowledge transfer / adoption
Department of Conservation Privacy of natural persons	Support for DoCs seed conservation programme	Established (<i>subcontract not required</i>)	Melanie Mark- Shadbolt, Privacy of natural persons	4	Ongoing Keep them informed, attempt to align work programmes, seek co- funding
TTW Ambassadors	Engaged in all work especially the seed conservation & myrtle rust mahi	Established (<i>subcontracts maybe required</i>)	Privacy of natural persons & 9(2)(a)	2, 3, 4	Open Some embedded in the research, others engaged regularly and directly to ensure transparency and

					knowledge transfer / adoption
BGANZ	Support for all RA's and access to information for whānau Māori	Established (<i>subcontract not required</i>)	Melanie Mark-Shadbolt, Privacy of natural persons	3, 4	Needs Strengthening
Variety of iwi, hapū and kaitiaki	Engagement in the work	Established (<i>subcontracts maybe required</i>)	All RA Leads	All	Open Some embedded in the research, others engaged regularly and directly to ensure transparency and knowledge transfer / adoption

International collaboration:

Group/Person	Nature of connection, skill	Established/Potential	Team member responsible	RAs	Status (for established connections), and Aim/plans for the coming year (2019/20/21)
Millennium Seed Partnership, Kew (9(2)(a) Privacy of natural persons , Conservation Partnership Coordinator – Europe & Oceania)	Seed conservation experts and trainers potentially required for RA4	Established	Melanie Mark-Shadbolt	4	Good Potential support to develop protocols and seed conservation goals with iwi/ hapū. Possibility of meetings in NZ and visit with relevant communities at a later date (post-Covid)
9(2)(a) Privacy of natural persons Yellowhead Institute & Assembly of First Nations	Policy researcher and impact assessor with experience in telling stories about impact for indigenous organisations	Established	9(2)(a) Privacy of natural persons	All	Strong Potentially use as a critical friend to measure impact of our work programme.
9(2)(a) Privacy of natural persons Kanaka Maoli	Rapid 'Ōhi'a Death (ROD) Statewide Outreach Coordinator; skills and experience useful for RA3	Established	Alby Marsh & 9(2)(a) Privacy of natural persons	3	Good Virtual meetings to gather and embed learnings from her ROD outreach programmes in RA3; a possible critical friend for monitoring or evaluating RA3
9(2)(a) Privacy of natural persons , Inuit	Indigenous leader, Mayor with experience at the international/UN level discussing indigenous rights	Established	Melanie Mark-Shadbolt	4	Strong Virtual meetings to get advice on UN protocols and support for indigenous rights & interests in biodiversity; a possible critical friend for RA4.
9(2)(a) Privacy of natural persons Cree Nation	Indigenous land manager with skills useful in RA 2 & 3	Established	9(2)(a) Privacy of natural persons	2,3	Strong Maintain relationship virtually until such time as the best use of his skills is determined
Privacy of natural persons (9(2)(a) Privacy of natural persons , 9(2)(a) Privacy of natural persons & 9(2)(a) Privacy of natural persons)	Indigenous land manager, researcher and political leader able to offer comparative examples,	Established	Privacy of natural persons	3	Good Virtual meetings to get advice on myrtle rust management; possible critical friends for RA3

9(2)(a)	information etc. and a Kaitiaki (land protector)				
Butchella, Yuggera Nation (9(2)(a) & 9(2)(a))	Indigenous land manager and political leader able to support RA 3	Established	Privacy of natural perso	3	Good Virtual meetings to get advice on myrtle rust management; possible critical friends for RA3
9(2)(a) Umatilla, Intertribal Timber Council, Portland, Oregon – Bureau of Indian Affairs & University of Washington & American Indian Science & Engineering Society	Technical Specialist (Forester), Forest Manager, Forest Engineer useful for RA's 1 & 2	Established	Privacy of natural perso	2,3	Good Virtual meetings to get advice on forest health; possible critical friends for RA1 & 2
USDA (9(2)(a), 9(2)(a))	Biosecurity and biodiversity managers	Established	Privacy of natural perso		Good

Co-investment opportunities:

Organisation/Group/Person	Opportunity	Established/Potential	Team member(s) Responsible	RAs	Status and/or help required to pursue opportunity
Department of Conservation	Team support and or resourcing for seed conservation protocols and collecting in hard to access areas	Potential: discussions underway	Melanie Mark-Shadbolt	4, 3	Open; link to SSAG discussions is useful
MPI	Cofunding for aligned research	Potential	Melanie Mark-Shadbolt	1	Open; help required to link to MPI Planning and Intelligence investment opportunities
B3	Potentially support for work that links to their work programme or capability development	Potential	Melanie Mark-Shadbolt, Privacy of	All	Open; conversations to be held once Ras are contracted
Bio-Protection Research Centre (Aotearoa Biosecurity)	Potential alignment of research	Potential	Melanie Mark-Shadbolt	All	Open; help maybe required to pursue this as an opportunity or to have the conversations
Ngā Pae o Te Māramantanga	Potential alignment of research	Potential	Privacy of natural persons	All	Open; help maybe required to pursue this as an opportunity and or have the conversations

Overview of Research Investment

How we scoped the development of our plan?

Ngā Rākau Taketake (NRT) investment *Te mauri o te rākau, te mauri o te ngahere, te mauri o te tāngata* (known as *Mauri Ora*) kicked off in June 2019 with a request from the Challenge to Te Tira Whakamātaki (TTW) to lead the development of a vital, and strategically important, piece of work within the Kauri Dieback (KDB) & Myrtle Rust (MR) SSIF platform. TTW is a community based indigenous environmental not for profit that focuses on empowering indigenous communities to design their own solutions. Our approach to developing programmes is to ensure they are community designed and driven. Our role is to facilitate conversations, offer administrative support, and provide peer review to ensure science excellence and contract compliance.

A broad scoping investigation was undertaken to inform the development of an Annual Work Plan (AWP) for the Oranga workstream, known as *Mauri Ora*, within the Ngā Rākau Taketake SSIF programme, administered by the NZ Biological Heritage National Science Challenge.

The AWP was developed with guidance from the:

- Ngā Rākau Taketake Rapid implementation Group,
- Ngā Rākau Taketake Plant Pathogen Scoping Panel Report,
- Kauri Dieback and Myrtle Rust Strategic Science Advisory Groups Science (SSAG) Plans,
- Tranche one projects from the Challenge, and
- Kōrero with:
 - o iwi, hapū, whānau from kauri dieback and myrtle rust infected lands,
 - o Māori environmental technicians and kaitiaki who are or have been actively involved with either kauri dieback or myrtle rust work,
 - o kaumatua, rongoā practitioners and Rangatira,
 - o rangatahi (youth), and
 - o Māori academics/researchers especially those from aligned research programmes (past and present).

Alignment with engagement work done by the NRT Scoping Panel and other Ngā Rākau Taketake workstreams developing annual workplans ensured we didn't over-burden the same communities, people, stakeholders etc.

Expectations of the initial investigative work was the identification of areas of mātauranga-based research to be included in the AWP that supported and aligned with Māori aspirations for their ngahere (forests) and whenua (lands), and where possible built on previous or existing work. Additionally, it was expected that research leads, and participant communities would be identified.

How we picked what to invest in?

The Oranga section of the NRT Scoping Panel Report highlighted the need for research to be Kaupapa Māori-led, to explore explicit mātauranga solutions such as rongoā (Māori remedy, medicine), and be underpinned by maramataka (Māori lunar calendar). More specifically it noted the need for the Oranga workstream to include social science and mātauranga Māori research lead by teams of Vision Mātauranga³ experts. It indicates the need to partner with mana whenua⁴, connect to previous research and support kaitiaki and rangatahi (youth).

The SSAGs reports also emphasise the requirement to facilitate strong and equitable partnerships with Māori researchers and communities. They indicate that research should be co-designed recognising that Māori have distinct knowledge bases which can contribute to innovative biosecurity solutions. A key priority is for kaupapa Māori research approaches and research defined and led by Māori.

To develop the annual workplan, TTW held a number of initial hui with key members of the NRT Plant Pathogen Scoping Group, NRT Rapid Implementation Group, Challenge Tranche 1 project leads, key kaumatua/knowledge holders, and Challenge SLG members. The team then contacted various representatives; from relevant iwi, hapū,

³ Vision Mātauranga is the Governments science policy on Māori inclusion in RSI

⁴ Mana whenua are those with territorial rights and power over lands and territories

whānau, including kaitiaki and environmental practitioners; Challenge Parties; and other key agencies/organisations e.g. Ministry for the Environment, Department of Conservation, and private providers such as Swampfrog and Perception Planning. These hui (meetings) and kōrero (conversations) were designed to seek information from Māori on their aspirations for KDB and MR and identify gaps in the mātauranga Māori research space. What became abundantly clear, very quickly, was the reluctance of Māori communities to relitigate the priority investments needed in the mātauranga Māori space. Feedback was that this had been done in the SSAG, RIG and Scoping processes, as well as the '*independent review of the state of kauri dieback knowledge (2016)*'⁵, the numerous Kauri governance reviews⁶ and recent MR research reports.⁷ Instead there was a desire to discuss the inability of government and research agencies to procure, govern, manage and deliver kaupapa Māori research led by kaitiaki and rongoā practitioners, and keep them and the research safe. This led to a focus on the development of goals, objectives, assumptions, criteria for selecting investment, and key performance measures, over the actual research projects which they felt were fairly obvious given the numerous reviews noted earlier, and the outline in the *Mauri Ora* contract. Participants who engaged with the development of the workstreams within the AWP were less concerned about specific research interests and more interested in determining the ultimate outcome of the mātauranga Māori research, and developing a set of criteria for selecting investment in the *Mauri Ora* workstream. Based on feedback from the hui/kōrero, the team drafted goals and objectives, assumptions, investment criteria and KPI's (see below). These were then taken back to those consulted in the first instance, tested, refined, and confirmed.

The criteria for investment was used to test suggested research projects noted in the various plans, reviews and *Mauri Ora* contract. A long-list of projects was developed and the team took the list out to test with stakeholders, communities and key individuals (as noted previously). As a result of the above process, the following set of goals (aims and objectives), assumptions, criteria for investment and key performance indicators were developed and agreed to.

The 2075 goal/aim of Mauri Ora is:

Our mokopuna⁸ are accessing and engaging with the ngahere for cultural, physical and spiritual outcomes unencumbered by myrtle rust and kauri dieback.

Mauri Ora 2024 goals/objectives are:

- Affected Māori communities are empowered to protect and restore their ngahere from kauri dieback and myrtle rust.
- Māori are leading positive system change in forest biosecurity leading to an increased resilience to tree pests and diseases, especially as related to kauri dieback and myrtle rust.
- The Māori environmental worldview is an intrinsic part of restoring the ngahere from kauri dieback and myrtle rust.

Assumptions:

Our investment is also driven by a set of beliefs, they are:

- Māori have the passion, skills and commitment required to save their trees and forests.
- The biosecurity system does not currently understand and cater for Māori ways of knowing, working and being but it is willing to adapt and change.
- The proposed work will align with the recommendations of the Strategic Science Advisory Groups (SSAGs), Rapid Implementation Group (RIG) and Plant Pathogen Scoping Group (PPSG).
- This themes research will provide a foundation for work contributing to the achievement of our 2075 goal.

Criteria for investment:

We will select for investment research that contributes to our goals, and:

- Would not be procured by mainstream institutes because it falls outside their scope of expertise and/or interest;

⁵ <https://www.kauridieback.co.nz/media/1537/14-independent-review-of-the-kdb-programme-a-black- -i-dickie-2016.pdf>

⁶ Ref and links

⁷ <https://www.myrtlerust.org.nz/science-and-research/mpir-research-reports/>

⁸ Grandchild/grandchildren

- Addresses issues that concern hapū (subtribe) and kaitiaki, and accordingly, the research must at least involve, but ideally be driven by, the affected communities;
- Qualifies as mātauranga or culturally driven investment (scores VM5 on the Challenges Vision Mātauranga classification framework⁹);
- Can be completed, inclusive of all deliverables, by 30 June 2022/23; and
- Clearly links with investments and programmes of the past and other investments within Ngā Rākau Taketake.

Measures of Success / Our KPI's:

At the end of the programme we will measure our impact on the system, and success by documenting changes in the following areas:

- 1. We are showing how New Zealand's 'science eco-system' is changing (to be more inclusive of and responsive to Māori):**
 - Māori have defined the terms of engagement, investment, measures of success (*increasing amounts of research is being designed by Māori, with Māori and for Māori*).
 - Māori researchers (scientists and kaitiaki) are finding their own solutions and protecting their forests (*Māori research/participant numbers increasing; Māori first authorship; research funding secured by Māori; educational succession and connection between outreach, summer internships, post-grads and post-docs; AND there is evidence of greater connection between tauira-mātanga-tohunga¹⁰*).
 - The system has been held to account for past behaviours (*proof of lessons learned; telling of stories – recording history; evidence of change in best practice from research governance down to researchers*).
 - Māori values are embedded through all our work (*evidence of Māori practice and language in the research environment; the level of comfort and confidence in our research by Māori 'stakeholders' is surveyed as per MBIE requirements*).
 - Māori narratives are being heard (*Māori stories are being told – recordings of Māori history/narratives is taking place and being returned to the rightful owners; there is evidence of a change in best practice from research governance down to researchers etc.*)
- 2. We are actively dispelling myths (about KDB and MR investment and research with Māori)**
 - Māori are able to, and are accessing kauri dieback and myrtle rust data and information (*via website data and Māori survey*) in order to make informed decisions about what work is being conducted and how they can use it (*confidence of Māori is maintained and increasing; kauri-land summits are held to share information*).
- 3. We are innovating**
 - Ngā Rākau Taketake is developing, creating and funding more mātauranga-driven projects and more projects sitting at the nexus of mātauranga and science (*% of NRT investment at VM5 is increasing*).
 - Mātauranga solutions for KDB and MR are being funded and developed, and are successful in engaging Māori and growing Māori research capability, as well as highlighting Māori technical skills and knowledge (*case studies demonstrating value of mātauranga Māori; culturally acceptable methodologies, approaches and protocols are developed*).

Selected investment will be made in the following areas:

(See appendix 1 for further information on how these areas were selected)

Four key, interlinked projects have been selected for funding:

- **Te whakaora a ngā kauri: Rongoā solutions for kauri dieback** comprises two projects, one led by emerging researcher privacy of natural persons at the University of Waikato and supported by a Post-Doc, and the other by well-known rongoā practitioner privacy of natural persons from Ngāti Hine. Both teams will be supported

⁹ <https://bioheritage.nz/about-us/vision-matauranga/>

¹⁰ Tauira (apprentice/novice), mātanga (skilled practitioner), tohunga (expert)

by Te Tira Whakamātaki and guided by both HPK-HPM (kaumātua governance group) and programme co-lead [Privacy of natural persons]. This programme will be supported by NRT Theme 7 Tools for Detection.

- **Te reo o te waonui a Tāne (the language of the domain of Tāne)** is a project led by early career researcher [Privacy of natural persons] from AUT. He will be supported by Te Tira Whakamātaki and guided by HPK-HPM and his own group of knowledge holders. This programme will be linked to a seed and scoping project in NRT Theme 7 Tools for Detection.
- **Hapū solutions for Myrtle Rust** is led by [Privacy of natural persons] from Te Tira Whakamātaki but will include Māori communities as well as key research and government agencies. It will be supported by Te Tira Whakamātaki and guided by HPK-HPM and the participating communities.
- **Te mana motuhake a ngā kākano (the sovereignty of seeds)** – led by [Privacy of natural persons], Melanie Mark-Shadbolt and a small team of highly regarded kaitiaki. It will be supported internally by TTW support staff and guided by HPK-HPM and TTWs ambassadors/regional leads/kāhui. It is a joint programme with NRT Theme 4 Conservation & Restoration, and links to the Department of Conservation and Ministry of Primary Industries work.

A fifth project will function as a monitoring and evaluation framework to increase synergies and impact across Te Mauri projects and with other programmes:

- **A Critical friend approach** will become a core component of each RA to facilitate communication and cross-fertilisation of ideas and knowledge. It will be led by external social scientists [Privacy of natural persons] and [Privacy of natural persons] who have expertise in evaluation and interdisciplinary and cross-cultural working.

Other projects will increase synergies and impact across Te Mauri projects and/or NRT themes:

- **Integrated Māori Workplan** a proposed joint work programme across all NRT themes, develop and lead by the Māori leads of all the themes. Aimed at ensuring Māori communities are not fatigued by NRT researcher demands, that engagement is joined-up and contracting for services is streamlined.
- **International Indigenous Programme** aims to ensure international links are included across the Mauri Ora RA's, and NRT themes, in a coordinated and streamlined manner.

Alignment with Plant Pathogen Scoping Group:

As noted earlier (and further in appendix four) the Oranga section of the NRT Scoping Panel Report highlighted the need for research to be Kaupapa Māori-led, to explore explicit mātauranga solutions such as rongoā, and be underpinned by maramataka (Māori lunar calendar). More specifically it noted the need for the Oranga workstream to include social science and mātauranga Māori research lead by teams of Vision Mātauranga experts. It notes the need to partner with mana whenua, connect to previous research and support kaitiaki and rangatahi. These elements are embedded throughout the proposed annual workplan.

Alignment with SSAG Science Plans:

Both the Myrtle Rust and Kauri Dieback Science plans specifically identify the importance of enabling Mātauranga Māori as a key strategic priority for New Zealand science. There is a strong commitment to work in partnership with Māori communities and fund Māori-led research and tool development. Crucial areas for development include the promotion of Māori leadership and participation in plant disease research as well as improving capacity and capability. There is much work to be done also on building trust between Māori communities and current research organisations and funding systems. For further information on how this annual workplan aligns with the SSAG science plans see appendix four.

Team Selection:

(see appendix 1 for further information on how these teams were selected)

Teams were selected using the Biological Heritage National Science Challenges guidelines and standards. In addition, they had to: align with challenge values, be proficient in and able to lead Kaupapa Māori research, have a working understanding of te reo Māori me tikanga Māori, have experience working with whānau Māori, be well networked, and be approved by HPK-HPM.

Impact measures:

In addition to the 2024 goals noted above, we expect to see the following outcomes (these come from our workplan and or joint Māori workplan):

By June 2020

- Annual workplan for *Mauri Ora* (Oranga) submitted
- Appropriate project leads are contracted, have engaged with the relevant communities and ensured that research activities have social acceptance.
- Key Māori researchers are embedded in all Ngā Rākau Taketake investment, supported by this programme (this theme and themes were we have co-investment).
- Key Māori influencers (TTW ambassadors, kaitiaki, kaumātua etc.) are in place and working to ensure the research programme is appropriate, achievable and supported.

By September 2020

- An online myrtle rust kauri dieback wānanga has been held with available kaitiaki to update on progress and reflect.
- A seed conservation wānanga has been held with available kaitiaki to update on progress and reflect.

By December 2020

- The *Mauri Ora* data management team (see appendix three) have developed culturally appropriate protocols and agreements for collection, use and management of Māori data arising from this programme.
- Critical friends have developed an evaluation framework and research protocol in collaboration with RA leads, kaitiaki and the Challenge.

By June 2021

- Culturally appropriate protocols for seed conservation, germplasm storage and genomics work in the Kauri Dieback and Myrtle Rust areas have been developed and implemented in relevant spaces.
- Rongoā solutions for kauri dieback have been identified for testing.
- Hapū / kaitiaki are actively engaged in myrtle rust research including development of surveillance frameworks, tools and solutions.
- Kupu Māori (Māori words) that mimic the sounds of the forest will have been identified.
- Influencers and champions are raising awareness of the programme and disseminating information.

By June 2022

- Rongoa tools are being developed and deployed to key sites for testing.
- Waiata/mōteatea/karakia using identified key words have been mapped against a forest health framework.
- We have concrete examples of reconnecting Māori to the knowledge of their taonga.
- Transparency of *Mauri Ora* has led to greater uptake; influencers, champions and kairangahau are being invited to present at whānau, hapū, iwi, Māori events.

By June 2023

- Rongoā tools for kauri dieback are being developed and deployed across the country.
- Sound counts / soundscape analysis has been undertaken in both healthy and diseased forests.
- NZ's seed conservation practices are in alignment with Te Tiriti o Waitangi, Wai 262 and other relevant declarations, and Māori are leading seed conservation conversations and practices.
- Hapū, whānau are effectively and efficiently dealing with myrtle rust incursions.

Uptake potential and implementation pathway:

How will you facilitate/ensure uptake and implementation of the research findings? Key partners or stakeholders that are contributing to implementation, adoption and scale-out?

Potential Uptake:

- *Mauri Ora* will constitute a step-change in the way research is undertaken with tangata Māori (Māori people). Its processes and protocols will be used to inform future and emergent research and science investment practices.
- *Mauri Ora* engagement methods will highlight how meaningful research with indigenous communities creates better results for the protection and management of biological heritage. As an example, the protocols, principles and tools developed for acquiring, curating, protecting and sharing mātauranga data

and information, as well as building long-term resilient relationships, will be shared and adoption by science institutions, ministries, regional councils etc. will be encouraged.

- *Mauri Ora* will show how kaupapa Māori led projects strengthen mātauranga Māori, and its contribution to current national resource management aims. Outputs will be shared, and partners/stakeholders will be supported to adopt and implement recommendations.
- *Mauri Ora* will resolve previous challenges with procuring indigenous communities to conduct research as legitimate and active partners.
- *Mauri Ora* will show the impact tangata Māori can have on the biosecurity system and bicultural decision-making when indigenous communities are resourced adequately to participate.
- *Mauri Ora* will have international significance creating lasting connections and influence with global indigenous communities, wider academia and policy.
- Impact of implementation, and stakeholder engagement will be measured and reported against using a critical friend approach (RA5).

Key partners for implementation:

The above uptake can only be achieved if we work in partnership with others including, but not limited to:

- Iwi, hapū, whānau, Māori (many groups including Ngāti Hine, Ngāti Wai, Ngāti Porou, Te Arawa);
- Biological Heritage National Science Challenge Tranche 2 Investments and NRT Themes;
- Department of Conservation;
- Ministry of Primary Industries;
- Botanical Gardens of Australia & New Zealand, Seed Partnerships including Millennium and Australian; and
- Crown Research Institutes (i.e. Plant & Food Research, Scion Research, Manaaki Whenua Landcare Research).

Activities to promote pathways to impact are identified in Table below:

Specific impacts	Related activities	Activities to promote impact	Beneficiaries and stakeholders
Learning and capacity building			
Interdisciplinary/transdisciplinary learning within the Challenge programme; participatory interdisciplinarity with stakeholders	1,2,4	1. Research team meetings	Academics, practitioners, Kaitiaki, knowledge holders
		2. Exploring community and stakeholders' perspectives	Practitioners, industry, policy, NGOs, citizens
Exchange of expert knowledge & broader public awareness	1,2,3,5	3. Establishment of an Expert Advisory Panel (HPK-HPM) to guide project approach and activities. It will meet regularly throughout the research programme	Practitioners, academics, Kaitiaki, knowledge holders
Strengthening Māori capacity in biosecurity research	4,5,6,7,8	4. International biosecurity workshop to link communities of interest/practice e.g. academic scientists with kaitiaki, rongoā practitioners, knowledge holders etc.	Policy, academics, industry, practitioners, Kaitiaki, knowledge holders, NGOs, citizens

Intergenerational learning	3,4,10	5. Specific learning workshops with broader range of experts to discuss/test methodologies & technologies	Academics, practitioners, knowledge holders
Building trust & greater cooperation between researchers, policymakers, kaitiaki and iwi environmental and rongoā practitioners	1,3,5,9	6. National Meeting 1: scene setting for the projects and inviting input and experiences	Policy, academics, industry, practitioners, Kaitiaki, knowledge holders, NGOs
Research and technological innovation		7. National Meeting 2: creating effective technologies and solutions and sharing lessons	Policy, academics, industry, practitioners, Kaitiaki, knowledge holders, NGOs
Creating holistic solutions	6,7,8,9	8. National Meeting 3: innovations for resilient outcomes	Policy, academics, industry, practitioners, Kaitiaki, knowledge holders, NGOs
Development of protocols, principals and tools that are shared	3,6,7,8,9	9. Engage with other Challenge programmes, science institutions, ministries and councils utilising their key dissemination channels	Academics, policy, practitioners
Improving connectivity, productivity and biosecure solutions for New Zealand's people and trees	4,5,6,7,8	10. Create interactive web-based resource that will facilitate early knowledge sharing & adoption of rongoā solutions	Policy, academics, industry, practitioners, Kaitiaki, knowledge holders, NGOs, citizens
National and International engagement			
Creating a learning and collaboration legacy that will continue after the project ends	4,10		

Science excellence:

How are the team across and within RAs ensuring science excellence?

Science excellence in *Mauri Ora* is defined as: *“research that is relevant to and contributes to the empowerment of Māori communities; leads positive system change for Māori in biosecurity & science investment; and creates societal or cultural impact especially in the development of Māori capability”*.

We expect work that comes out of *Mauri Ora* will undergo a peer review process coordinated by the Challenge and its ISAP. In addition we are committed to ongoing peer evaluation through the critical friend process proposed in RA5. Our plan for producing peer reviewed publications can be seen in appendix two, though we note this is of less importance to our communities and for those reasons we are equally committed to ensuring science excellence in the following ways:

- Grounded within indigenous ways of knowing, each RA supports revitalisation of mātauranga by enabling data, information and knowledge exchange internally and externally between Māori, indigenous peoples and science.
- Each RA ensures equity and diversity at all stages of development by focussing on finding the right expertise. This strongly transdisciplinary approach tests methods, approaches, and tools from one discipline and knowledge system to another, and in doing so, develops transformative insights and feasible adoption.
- Each RA emphasises the societal and cultural impact and relevance of the research by ensuring that kaitiaki and rangatira who have experience in biodiversity, biosecurity and environmental resource management, as well as key agencies, players & groups, are engaged at the appropriate stages.

- Each RA ensures that it is considering succession and capability at all stages of development by ensuring there are spaces and places available for emerging kairangahau, kaitiaki etc.

Investing in people/Capability development:

Summarise any initiatives around capability development for the coming year.

- *Mauri Ora* will enable increased capability of tangata Māori to understand the two pathogens through their exposure to western scientific knowledge on the pathogens so far in the wider Ngā Rākau Taketake programme, so that they can use this knowledge to support and inform their protection and management solutions.
- *Mauri Ora* will build data sharing capabilities and protocols beyond academic and crown funded institutions, empowering Māori to share information and ideas in a safe space.
- *Mauri Ora* will encourage tangata Māori to share their learnings with each other, and their communities in ways that are both meaningful and relevant, and easily adopted e.g. workshops, interactive training materials.
- *Mauri Ora* will ensure that the most affected Māori communities will gain access to relevant information about the pathogens through channels such as the Challenge knowledge sharing web forums.
- *Mauri Ora* will encourage hapū/iwi engagement with the wider biosecurity and science systems by increasing the opportunity for tangata Māori to engage with both systems.

Capability development will be addressed in 2020 through the development of a **Communications and Engagement Plan** which will note how ideas and information will be shared across RAs, into the wider Ngā Rākau Taketake programme and further afield. Additionally, each RA will be expected to identify outreach opportunities. Outreach and capability development will begin with a myrtle rust virtual wānanga for kaitiaki in June/July 2020 and seed conservation wānanga in July/August 2020.

Vision Mātauranga (VM):

Show how you will/are realising the opportunities and benefits of embedding Māori knowledge, resources and/or people in your research, and note any specific plans/actions for the coming year.

This research is kaupapa Māori-led research (VM 5), as per our investment criteria. That means it is research for Māori, by Māori and with Māori. Projects in this workstream will be led and run by indigenous researchers, and it is entirely based on Māori and indigenous knowledge or experiences. Equally the programme ensures that kaitiaki and rangatira who are experts in the required fields are engaged and resourced to participate fully.

In line with our commitment to Te Tiriti o Waitangi, Wai 262, and the relevant declarations (including UNDRIP and the Mataatua Declaration), the enduring protection, promotion and respect of mātauranga Māori is our promise (Toitū te mātauranga). To that end we are committed to developing protocols and arrangements that provide for the protection and management of mātauranga Māori.

Succession is of vital importance to *Mauri Ora* governance (HPK-HPM) and this research programme will be measured on its ability to engage and inspire the next generation of kaitiaki, rangatira and kairangahau (researchers).

With relation to the Vision Mātauranga policy we align specifically with all of the themes:

- **Taiao/environment;** achieving environmental sustainability through iwi and hapū relationships with land and sea. Our outcomes are designed to reconnect iwi and hapū to their whenua (lands).
- **Mātauranga:** exploring indigenous knowledge and science innovation. Our research is embedded in mātauranga and lead by mātauranga experts.
- **Indigenous innovation;** contributing to economic growth through distinctive research and development. Investment in Māori technical experts will bring financial support to hapū and whānau not often resourced to do the work they do as kaitiaki. We hope that our research will lead to

ongoing and increasing support for and resourcing of hapū and kaitiaki.

- **Hauroa/health;** improving health and social well-being. Improving the health of our ngahere (forests) is inextricably linked to improving the health of our people, culture and language.

Research Areas

Overview and rationale on selection/process for research areas (RAs) development and selection of "right team".

Note any inter-relation between RAs e.g. data from RA1 feeds into RA2. Provide indicative schedule of work effort across RAs and time.

Deliverables/KPIs/Outputs from each RA should be detailed below (next 12mths specific details, with indicative plans/placeholders for out years) – **collectively** the RAs should be aiming for peer reviewed publications at approx. 1 per \$200k of funding (along with other deliverables/outputs).

RA Schedule

Blue shading = significant sustained work,
Green shading = building up or winding down,
No shading = little to no work.

Research Area	Organisation	2019/20	2020/21	2021/22	2022/23
RA1A	Ngāti Hine (Rongoā solutions for KDB)	Maintaining existing work	Working	Working	Winding down
RA1B	University of Waikato (Rongoā solutions for KDB)	Planning	Working	Working	Winding down
RA2	AUT (Language of the domain of Tāne)	Planning	Working	Working	Winding down
RA3	Te Tira Whakamātaki (Myrtle Rust)	Planning & Maintaining Relationships	Working	Working	Finished
RA4	Te Tira Whakamātaki (Seed sovereignty)	Maintaining existing work	Working	Working	Winding down
RA5	Forest Research UK (Critical friend)	Preparing	Working	Working	Writing
Integrated Māori Workplan	NRT Themes 1-7 - TBC	Planning	Working	Working	Winding down

RA1: Te Whakaora a Ngā Kauri: Rongoā solutions for Kauri Dieback

This project aims to develop and test rongoā solutions that improve the health of infected kauri forests. The 1907 Suppression Act that banned Tohunga – the keepers of knowledge - from practicing has had a long-lasting effect on the environment by removing a vital body of indigenous knowledge to complement and inform western science-based understanding of the complex interactions between species in our landscape and waterbodies. The aim of RA1 is to provide a safe space to empower the rights of Māori kaitiaki and rebuild the prominence of the Tohunga to provide solutions for threatened ngahere. However, Tohunga practice has rarely been documented outside of key Māori communities and a key part of RA1 will be to record the process and practices of the Tohunga as they trial traditional medicinal solutions for Kauri dieback. We will take an ethnographic and ethno-botanical approach using participant observation, record keeping and story-telling to capture and translate Tohunga tanga to promote further intergenerational learning amongst Māori but also inform and educate external research and policy decision-makers. Research

Ethnographic documentation of the process and practices of Tohunga will be a key part of two interlinked projects:

- RA1A - The Tohorā and the Kauri – rongoā solutions from our stories
- RA1B - The Tohorā and the Kauri – potential of Tohorā microbiome to act against Kauri Dieback

Project Title: RA1A The Tohorā and the Kauri – rongoā solutions from our stories

Project Lead(s): Privacy of natural persons

Project Summary: Māori have known for some time that the Tohorā and Kauri are inextricably linked via whakapapa (ancestry). The knowledge system that contains this information notes that solutions for issues affecting one can often be found in the DNA of the other. Therefore, mātauranga Māori would suggest the solution for kauri dieback can be found in the Tohorā. The goal of this project is to facilitate the protection, restoration and maintenance of the mauri and integrity of kauri ngahere against the presence of PTA by using traditional medicine knowledge and practice to create balms and solutions from the Tohorā to apply to the kauri.

Personnel:

- Principal Investigators Privacy of natural persons and Privacy of natural persons will lead this project
- Research Assistant Privacy of natural persons will assist the PI
- Kaumātua from HPK-HPM and further afield will be needed for their mātauranga and to harvest the (already deceased) whales.
- Rangatahi and taura (students) will be given the opportunity to learn alongside the PI.

Budget:

Up to \$820k over 3 years, heavily front loaded as a Māori community driven project.

No.	RA1.10: Milestone/KPI	Personnel	Date Due	Deliverable
1A.10	Confirm HPK-HPM (kaumatua governance) membership and hold wananga to confirm processes and research aims.	Privacy of natural persons	Dec 2019 Feb 2020	Meeting notes
1A.20	Tohunga rongoā wānanga: - Experts bought together to wānanga options for bio-controls and ngahere enhancement based on traditional knowledge of the forest. - Wānanga confirms rongoā response to be tested and developed. - Wānanga confirms trial site requirements.	Privacy of natural persons	Nov 2019 Sept 2020	Wānanga held, plan developed to proceed and test ideas Wānanga Report confirming response and sites (for Māori communities, appropriate parts shared via TTW and Challenge websites)
1A.30	Rongoā Development Rongoā / biocontrol developed, method of application confirmed (including volume, frequency, ceremonial aspects required).	Privacy of natural persons	Nov 2019	Evidence of development and testing
1A.40	Rongoā Development Rongoā training plan developed.	Privacy of natural persons	Sept 2020	Report on rongoā solution developed (for Māori communities, appropriate parts shared via TTW and Challenge websites)
1A.40	Rongoā Trials - Trial sites chosen and mapped for their health - Rongoā applied - Monitoring and impact measurements in place - Annual wānanga held to discuss outcomes and make adjustments to solutions and or application	Privacy of natural persons	July 2020 – 2023	Site analysis report Quarterly updates Annual workplan and reports

1A.50	Outcome Report - Final wānanga held to report back on findings - Research published and presented to kauri dieback communities	Privacy of natural persons	May 2023	Final report Publication on process and potential solution(s)
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Project Title: RA1.20 The Tohorā and the Kauri – potential of Tohorā microbiome to act against Kauri Dieback

Project Lead(s): Privacy of natural persons; 9(2)(a)

Project Summary: The cell wall of *Phytophthora* is mainly made up of cellulose. The gut content of the Tohorā includes unique microbiome content which is mainly made up of cellulase that could possibly degrade the cellulose cell wall of *P. agathidicida*. We are interested in testing the microbiome gut content of the Tohorā on *P. agathidicida* found within the roots and collar structures of Kauri, which is the known cause of Kauri dieback (Weir et al, 2015). The Tohorā microbiome may act as an anti-*P. agathidicida* agent by degrading the cellulose content of the cell wall of *P. agathidicida* and therefore killing it. There is further potential that fungicide sprays located at most ngahere entry station may be developed from natural Tohorā microbiome to replace toxic solution sprays.

Personnel:

- A Senior Research Associate (Postdoc) 9(2)(a) will lead the project - in addition to bioremedial, mammalian microbiome and plant pathology expertise, the SRA has experience working within Māori community and a sound understanding of tikanga Māori protocol.
- Privacy of natural persons and Māori kaumatua will provide supervision and guidance.
- Masters students will be recruited to support the Postdoc.
- HPK-HPM may be employed to supervise and guide the project alongside other rongoā practitioners and kaumatua.

Budget (TBC):

Up to \$755k over 2 years (June 2020 – June 2022), high costs involved in having a fulltime Postdoc to complete the project within a short time frame.

No.	RA1.20: Milestone/KPI	Personnel	Date Due (TBC)	Deliverable
1B.10	Contract for Waikato University	Privacy of natural persons	June 2020	Contract signed
1B.20	Isolate fresh microbiome from beached Tohorā whales using kaupapa Māori approach under direction of Māori kaumatua. Under laboratory conditions, investigate the action of extracellular enzymes isolated from Tohorā microbiome for their anti- <i>P. agathidicida</i> action through DNA testing and cellulase enzyme analysis. Acquire and grow <i>P. agathidicida</i> in PC1 facility conditions.	Privacy of natural persons	Dec 2020 Ongoing	Postdoc appointed Quarterly updates
STOP-GO POINT – if researcher is unable to access Tohorā microbiome then we will have to reconsider this proposal (we have an alternative project we are developing for consideration also)				
1B.30	Preserve and protect mātauranga Māori of the Tohorā and Kauri through active engagements within the Māori community via Māori kaumatua and advisors who have an invested interest in Kauri dieback. Māori will be involved as active participants in the research from conception to dissemination.	Privacy of natural persons	Dec 2020 Ongoing	Protocols or protection plan in place

1B.40	Plant Kauri seedlings at beginning of Year 1 and grow in glasshouse conditions over 2 years.	Privacy of natural persons	June 2021	Site analysis report Quarterly updates Annual workplan and reports
1B.50	Inoculate 2 year old Kauri seedlings with <i>P. agathidicida</i> to induce infection under controlled glasshouse conditions. Apply Tohorā microbiome direct to infected Kauri seedlings after 5, 10 and 20 days post-inoculation	Privacy of natural persons	June 2022	Evidence of development and testing Quarterly updates
1B.60	Qualitative analysis of Kauri seedling physiology. Record shoot height/mass and root length/mass. Also record any signs of disease like root necrosis, shoot chlorosis, shoot desiccation, leaf loss/necrosis.	Privacy of natural persons	June 2022	Report on rongoā solution developed for Māori communities Peer reviewed publications

RA2: Te Reo o te waonui a Tāne (The language of the domain of Tāne)

Project Lead(s): Privacy of natural persons

Project Summary: Prayer and spiritual healing are a significant part of the medical system in many non-western countries but their relevance in environmental management has not been fully explored. In New Zealand the closet 'spiritual management tool' that has some acceptance is rāhui (prohibition that limits human access to areas and/or resources). This project is an exploratory study investigating the soundscape of native forests, in particular those that have high population growth of Kauri to address the following over-arching research questions:

- How can the soundscape of native forests inform us of the health and vitality of the forest?
- Do traditional Māori kupu (words), karakia (prayers) and waiata (songs) provide insight into forest health at the time of composition?
- Do the soundscapes of forests and reo Māori overlap?

This research will be comprised of three parts:

1. **Whakahuahua – Part I** Identify kupu Māori (Māori words) that mimic the unique sounds of the forest. The first utterance of te reo Māori 'tihe' was located in the forest, dating back to the first breath drawn from the creation of the first female Hine Ahu One. This cultural narrative recounts the story of Tāne Mahuta, the entity of the forest, upon breathing life into the nose of Hine Ahu One she sneezed voicing the words 'tihe mauri ora' – behold the breath of life. As such onomatopoeic te reo Māori words can be found widely in the domain of Tāne (God of the Forests). Many Māori bird names are derived from the unique sound birds makes such as Rūrū, Tui, and the Kea. Other forest sounds include 'pakē' – the cracking sound of a tree breaking, and 'pahū' the booming sound it makes as it hits the ground. This part of the study will build a collection of Māori words that mimics the sounds located in native forests.
2. **Waiata – Part II** will analyse and identify waiata that use these particular words, understand the context in which they were used with the intention that it may provide some insight into the state/health of the forest as at the date of composition.
3. **Whakarongo – Part III** the researchers will visit several Kauri forests and conduct a 'sound count' identifying and recording the frequency of the aforementioned kupu Māori (Part I) recorded. The intention is that a comparative soundscape analysis across the selected Kauri forest sites might help us identify what a healthy Kauri forest sounds like, and as such what an unhealthy Kauri forest sounds like.

Personnel:

- Principal Investigator Privacy of natural persons will lead this project, he may co-opt a co-lead.
- Kaumatua from HPK-HPM and specific forests will be included for their specific mātauranga associated with place.

- Māori students will be included as either a Master's or summer scholarship/internship.

Budget:

Up to \$600k over 2.5 years (June 2020 – Dec 2022), though this will be reviewed early in 2021.

No.	RA2: Milestone/KPI	Personnel	Date Due	Deliverable
2.10	Study plans and draft timetable for Whakahuahua (P1), Waiata (P2) and Whakarongo (P3)	Privacy of natural persons	Aug 2020	Research plan Quarterly updates
2.20	Workshop with Kaumātua to assess study plans and agree process	Privacy of natural persons	Dec 2020	Research plan Quarterly updates
2.30	Whakahuahua (P1): first draft collection of Māori words presented to Kaumātua	Privacy of natural persons	May 2021	Annual workplan and reports Report on kupu Māori Quarterly updates
2.40	Complete Whakahuahua (P1) and first assessment how and which words are used in Waiata (P2)	Privacy of natural persons	Dec 2021	Report on Whakahuahua (P1) Quarterly updates
2.50	Complete assessment of Waiata (P2) and linkages to forest health	Privacy of natural persons	June 2021	Annual workplan and reports Report on Waiata (P2) and a media piece Quarterly updates
2.60	Whakarongo (P3): Identify study forests in collaboration with Kaumātua	Privacy of natural persons	Dec 2021	Quarterly updates
2.70	Complete sound count of kupu Māori	Privacy of natural persons	June 2022	Final workplan and evidence of development and testing Quarterly updates
2.80	Complete comparative Soundscape analysis	Privacy of natural persons	Dec 2022	Report (creative piece) on soundscapes for Māori communities Peer reviewed publications

RA3: Hapū solutions for Myrtle Rust

This project aims to develop and test rongoā solutions that improve the health of infected kauri forests. It will closely align with the NRT themes "Building a Mātauranga Māori based surveillance framework for plant pathogens" which is focussed on integrating indigenous knowledge and approaches into surveillance systems, and 'Conservation Restoration' which is focused on empowering Māori to be kaitiaki. RA3 has already built strong relationships with key tāngata Māori and wider communities in myrtle rust areas and provides a link between the programmes. This project builds on from Project 2.4 in tranche one of the Challenge, and a recently completed MPI myrtle Rust research programme.

Project Lead(s): Privacy ; 9(2)(a)

Project Summary:

This project builds on research that has been conducted over the last two years. The aim of prior research programmes, driven primarily by agencies and scientific researchers was to determine how iwi, hapū and whānau alongside Māori organisations and Māori community could best respond to the growing list of pre-border biosecurity risks and threats. Key recommendations to emerge from the research was the need for Māori to lead their own research and the identification of solutions that cater to their needs not the needs of western ideologies. Much of the research involved but was not led by Māori. This new phase of research will now present what has been found so far to the Māori community and explore in detail how they want to respond to the current plant health crises. Currently, feedback from individuals in regions affected by MR suggests that the rohe (region) they represent are not able to access data and maps that have been developed so far to contribute or lead surveillance systems for iconic taonga like Te Rerengā Wairua (Te Taitokera) and Tangi-te-Korowhiti, (Kawhia) Hapū-led solutions to myrtle rust (RA3) will work alongside key Tangata Māori (Champions) in the regions to develop a programme designed to meet their needs rather than the needs of research organisations and agencies. The change will begin with the engagement process being led by the regional champion. They will lead the in-depth community consultation on needs and opportunities. The Champions will be the conduit between the research team and the rohe they represent. This relationship will allow the Challenge to build trust with Māori communities through improved and open knowledge exchange and greater engagement with other agency-led programmes. Year one will focus on building a collaborative space to identify Hapū-led solutions. Key research questions include:

- What are the main priorities and knowledge needs of Māori communities in tackling the spread of myrtle rust?
- How can the Challenge build trust with Māori communities and create long-term collaborative relationships with external scientific communities?
- What existing data, technologies and information portals for myrtle rust can be utilised by Māori to improve early detection, surveillance and mitigation activities on the ground? *(this is linked to other NRT themes including 3 and 4)*
- In what ways can increased interdisciplinary and transdisciplinary conversations around myrtle rust identify indigenous solutions and how can these be mapped and trialled?

Additional research questions that maybe examined in collaboration with other RA's and NRT themes include:

- How can we build trust and confidence in our relationships?
- Does having regional champions encourage information sharing?
- What plant species and places are Māori communities most concerned about?
- How can the Challenge provide a safe space for sharing stories and the Mātauranga associated with them?
- In what ways can these stories and wisdom be documented and presented to inform future protection?
- How can protection plans bring together indigenous knowledge presented through stories, scientific knowledge and observations of plant behaviour at specific sites?

Personnel:

- Principal Investigator [Privacy of natural persons] will lead.
- Associate investigator 9(2)(a) will support the PI and coordinate involvement of key hapū and kaitiaki
- Kaumātua from HPK-HPM will support the programme, as will locally based kaumātua.
- Rangatahi will be given the opportunity to learn alongside the team.

Budget (TBC):

Up to \$400k over 2 years (June 2020 – June 2022), though this will be reviewed early in 2021.

No.	RA3: Milestone/KPI	Personnel	Date Due	Deliverable
3.1	Widespread community engagement to identify needs and priorities to increase Māori involvement and leadership in Myrtle rust research and surveillance.	[Privacy of natural persons] 9(2)(a)	Dec 2020	Research workplan and identification of key areas of engagement

	Identify and appoint regional champions.			
3.2	- Organise and hold an induction hui for regional champions. Identify key regional needs and opportunities. Design and develop regional research plans, that incorporate their needs and identify opportunities. - Agree on format and process for sharing knowledge through stories.	Privacy of natural person 9(2)(a)	Dec 2021	Report on wānanga and workplan for regional champions Quarterly updates
3.3	Detailed review of existing tools, technologies and data related to Myrtle rust life cycle and distribution disseminated to regional champions and their communities – Māori able to utilise existing data, technologies, information portals	Privacy of natural person 9(2)(a)	Jan 2021	Annual Workplan
3.4	Awareness building events (through face-to-face, online and social media, educational tools) targeted towards each communities' interests and needs such as highlighting existing information portals. Building relationships	Privacy of natural person 9(2)(a)	June 2021	Quarterly updates Evidence of kōrero and hui
3.5	Widespread community engagement to identify which endangered plants or areas of significance are priority for protecting and knowledge sharing.	Privacy of natural person 9(2)(a)	Dec 2021	Quarterly updates Evidence of kōrero and hui Media piece
3.6	Trust based relationships examined and articulated for long-term collaborative relationships between indigenous communities and scientific communities	Privacy of natural person 9(2)(a)	June 2022	Peer-reviewed publication(s)

RA4: Te Mana Motuhake a Ngā Kākano: the Sovereignty of Seeds

Project Lead(s): Privacy of natural persons Melanie Mark-Shadbolt

Project Summary:

While it is extremely important that seeds of our taonga plants are collected and stored where appropriate to ensure their future survival, Māori communities have rarely if ever been consulted or adequately involved in the process. For example, in some instances sites sacred to Māori have been harvested for seeds without free, prior or informed consent as required under the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP). This project will work towards reclaiming seed conservation mātauranga (Māori knowledge) and develop collaborative agreements with seed conservation establishments based on equality, fairness and open knowledge exchange. Co-developing seed conservation protocols that identify knowledge needs and training of indigenous communities whilst protecting their rights as custodians of taonga species is crucial to optimising the long-term disease management of myrtle rust.

The first year will focus on building a solid foundation for a research programme that will bring together Māori communities with other scientific establishments to develop a collaborative and safe space for co-development of culturally appropriate seed conservation.

Research questions:

Baseline

- Which organisations/agencies are currently engaged in seed conservation?
- Where are the seeds held and under what conditions?

Knowledge and capacity building

- What support, training and equipment is needed to empower and upskill Māori practitioners in seed

collection, storage and monitoring?

- Who can provide the training and knowledge and what are the most cultural appropriate formats for knowledge exchange to take place?
- In what forms can access to training and knowledge transfer be provided during periods of 'social distancing' where face-to-face engagement is not appropriate? How can alternative modes of communication address different diversity, age and gender needs?

Knowledge protection

- What is good practice in seed sovereignty?
- Are current seed sovereignty protocols culturally appropriate and where do they need to be improved?
- What IPR is currently in place to protect seeds that are held in storage and how can these be enhanced for better cultural protection?

Personnel:

- Principal Investigators [Privacy of natural persons] and Melanie Mark-Shadbolt have already been working in this space for many years and sit across many groups with seed conservation objectives.
- Associate Investigators 9(2)(a) [Privacy of natural persons], 9(2)(a) [Privacy of natural persons] and [Privacy of natural persons] are all known for their advocacy work in the protection of taonga and mātauranga. 9(2)(a) [Privacy of natural persons] at the international level, [Privacy of natural persons] with government agencies, and 9(2)(a) [Privacy of natural persons] locally with her people and research organisations. They have all been involved in seed conservation kōrero in the past.
- Kaumātua from HPK-HPM, and knowledge holders from Te Tira Whakamātaki Kāhui will offer guidance and support.
- Rangatahi will be given the opportunity to learn alongside the team.

Budget (TBC):

Up to \$470k over 3 years (June 2019 – June 2023), though this will be reviewed early in 2021 and co-funding is being sought from NRT 4 Conservation & Restoration and the Department of Conservation.

No.	RA4 Milestone/KPI	Personnel	Date Due	Deliverable
4.1	Scope out which establishments are currently engaged in seed conservation and analyse their IPR protocols	[Privacy of natural persons] Melanie Mark-Shadbolt	Dec 2020	Review of protocols Quarterly updates
4.2	Co-develop new culturally acceptable methodologies for seed/germplasm collection and protection in MR and KDB	[Privacy of natural persons] Melanie Mark-Shadbolt	Jan 2021	Protocols Annual workplan
4.3	Identify knowledge and training needs across broad scope of Māori communities and formats in which this can be provided (and by whom)	[Privacy of natural persons] Melanie Mark-Shadbolt	Jan 2021	Quarterly updates
4.4	Identify good practice in seed conservation and compare with current practice	[Privacy of natural persons] Melanie Mark-Shadbolt	June 2021	Seed Conservation Capability Strategy Annual workplan
4.5	Support Māori communities to be involved in NRT lead seed/germplasm protection utilising tikanga-based approaches	[Privacy of natural persons] Melanie Mark-Shadbolt	Dec 2021	Quarterly updates Evidence of participation
4.6	Māori Seed Conservation Guide: New culturally appropriate strategy, guidelines, protocols for developing, managing and utilising ex situ collections developed with Māori	[Privacy of natural persons] Melanie Mark-Shadbolt	Dec 2022	Māori Seed Conservation Guide / Strategy Peer-reviewed publication(s)

RA5: A 'critical friend' approach to creating synergies and impact

Project Lead(s):

Privacy of natural persons

Project Summary:

A strong monitoring and evaluation framework will be developed to facilitate interactions between the RAs within Mauri Ora and between the Oranga theme, the other NRT themes and the Challenge Programme. Leadership and development of complex research programmes is challenging, and this is particularly true when individuals with diverse perspectives are brought together. When research programmes seek to address tough problems and generate impacts accordingly, they are likely to need to adapt and change over time. In the face of complexity with the need for dynamic evolution and a goal of generating impacts, critical friends can play a vital role by:

- Facilitating reflection and self-evaluation on an ongoing basis, throughout the life of the programme, from early stage goal identification through to implementation and end-programme and consolidation of impacts;
- Constructively challenging assumptions, plans and interaction approaches;
- Sharing insights and experience from other projects and programmes; and
- Promoting feedback and knowledge sharing between the overarching programme level and the level of individual projects.

Critical friends (experts on evaluation) will carry out the following tasks:

- **Assist with early identification of impacts, plans for impact generation and definition of indicators of progress toward impacts** (always accepting that full realisation of impacts will be influenced by factors beyond the programme's control). Critical friends can help to identify opportunities for synergy between project level plans for impacts and programme level actions.
- **Assist with early plans for development of processes to encourage cross-project and wider stakeholder collaboration.** Critical friends can advise on effective processes for achieving these goals and act as sounding boards to facilitate framing of robust collaboration plans.
- **Stimulate periodic reflection on progress** in terms of impact and in relation to research activities and collaboration. Critical friends can encourage participants to identify their own examples of good practice, so that cross-project learning occurs. This shared reflection can help to strengthen a sense of community within the programme.
- **Identifying issues emerging at programme and/or cross-project levels.** As critical friends encourage self-reflection, they can also spot emerging common issues or challenges which will need attention.
- **Helping teams to capture impacts and indicators of impacts-in-progress.** Critical friends can work with projects and the overall programme to ensure that a wide range of early-stage impacts (or steps toward impacts) are spotted, so that they can be tracked or indeed consolidated into full impacts, when possible.
- **Drawing forth insights on 'lessons learned' for the future.** Critical friends can engage participants at all levels in analysis of 'what works', which will be of benefit to them as individuals as well as to further development of the programme.

Budget

No.	RA5 Milestone/KPI	Personnel	Date Due	Deliverable
5.1	Meetings with programme management, RA teams and HPK-HPM to discuss aims of critical friend approach, highlight emerging issues and how to address them, refining impact criteria. Agreement on how pathways to impact will be documented	Privacy of natural persons	July 2020	Research brief

5.2	Interview each with project PIs on impact planning and evaluation, experiences with interdisciplinary and cross-cultural working, stakeholder engagement, possible next steps.	Privacy of natural persons [redacted] [redacted]	August 2020	Report for each PI and summary document
5.3	Conduct one or two workshop sessions at programme level workshop to discuss with project participants culturally appropriate knowledge exchange processes, impact generation and evaluation	Privacy of natural persons [redacted] [redacted] Melanie Mark-Shadbolt; Privacy of natural persons [redacted]	Sept/Oct 2020	Ppt and workshop notes
5.4	Mid-course meeting to reflect on progress - Interviews with project PIs and teams to re-assess impacts-in-progress and identification of any tensions or issues	Privacy of natural persons [redacted] [redacted]	Jan/Feb 2021	Feedback report
5.5	Assistance with end of year reflections and summaries of progress toward impacts, interdisciplinarity and cross-cultural/programme/stakeholder collaboration	Privacy of natural persons [redacted] [redacted]	May 2021	Feedback report Publications in conjunction with other RA's i.e. process and benefits of working with knowledge holders in RA1; or recommendations for improvements in research in indigenous communities

Risks (feasibility and achievability)

Consider any risks/barriers that could impede progress to achievement of the 2024 Goal(s), and/or risks to uptake/implementation of research findings – how likely are they to materialise, and what will be done to eliminate/minimise/mitigate these risks?

Team members, kaitiaki, rangatira, key communities, agencies and or funders will not always achieve consensus on what should be funded, who should conduct the work, which sites should be prioritised, what solutions should be progressed, and what information should be shared.

Where there is disagreement or conflict it is anticipated that hui will be necessary. That can be time, labour and resource intensive as representatives of each party consult with their constituents before being brought together.

HPK-HPM has been developed as governance and guardians of the programme and its process. They will set direction for addressing conflicts and it is anticipated that HPK-HPM can guide that process to ensure efficiency.

In addressing such risks and conflicts, it is relevant to maintain active communication and engagement with all parties involved, but particularly with the communities affected by myrtle rust and kauri dieback. To that end risk mitigation will be addressed in the Communications & Engagement Plan. A table will be inserted in future annual workplans noting risks and mitigations.

TO BE COMPLETED

Risk ID	Description	Category	Likelihood	Impact	Mitigation	Post Mitigation Likelihood	Risk Owner
RO1	We cannot deliver project milestones	Delivery	2	5	Develop a research plan and timeline for delivery Ensure support is wrapped around each RA lead, and delivery monitoring is in place Insert strong stop/go points to measure progress	2	TTW and RA lead institutes, organisations etc.
RO2	We aren't able to maintain appropriate project governance capacity and capability	Finance / Reputation	1	4	Ensure the governance team's skills matrix is appropriate for needs, and succession plans are in place	1	TTW
RO3	Loss of key personnel	Resource	2	4	Succession planning, good HR management, procedures and training (where relevant). Ensure early careers are included, and RA's are communicating and up to speed on each other projects.	1	TTW and RA lead institutes, organisations etc.
RO4	Risk to our reputation from non-delivery by sub-contractors	Finance / Reputation	3	4	Academic support provided, project delivery support provided, tuakana-teina mentoring and support implemented	2	TTW
RO5	Negative profiling of the project or TTW in the media	Finance / Reputation	2	5			
RO6	Negative profiling of the project or TTW with iwi Māori	Finance / Reputation	1	5			
RO7	Negative profiling of the project or TTW by the research sector	Finance / Reputation	3	5			
RO8	Negative profiling of the project or TTW by the Challenge	Finance / Reputation	1	5			
RO9	Negative profiling of the project or TTW by the Challenge Host (Manaaki Whenua Landcare Research)	Finance / Reputation	5	5			
RO10	Manaaki Whenua Landcare Research does not meet its contractual obligations	Finance / Reputation	5	5			
RO11	Budget constraints mean unable to support multiple projects to cover iwi Māori interests and aspirations	Finance / Resource / Reputational	4	3			
RO12	Significant breach of either a mana enhancement agreement, cultural safety agreement or tikanga Māori	Reputational / Delivery	2	5			
RO13	Lack of transparency or information dissemination to the wider Māori community	Reputational / Delivery	3	4			

The BudgetTotal Challenge Investment allocated: **\$4,000,00**

Investment area	Current funding to June 2020 \$'000	Investment approved to June 2021 \$'000	Proposed FY22 \$'000 10% for flexibility/pivot	Proposed FY23 \$'000	Proposed FY24 \$'000	Total \$'000
Ngā Rakau Taketake SSIF Platform						
Theme 1	\$600	\$1,100	\$1,200	\$1,100		\$4,000

Future years are contingent upon approval of annual plan by the Challenge.

Co-Funding**Unconfirmed:**

\$30,000 (in discussion with Privacy at DOC, RA 4)

\$TBC (in kind time from Ngāti Porou, Ngātirua, Swampfrog and others)

\$TBC (in discussions with Millennium Seed Partnership, Kew & Australian Seed Partnership, RA 4)

Confirmed:

\$TBC (in kind time from Te Tira Whakamātaki)

Indicative Funding Below – Still areas to be negotiated (especially the integrated Māori workplan)

Research Area	Organisation Subcontractor	2019/20		2020/21		2021/22		2022/23		TOTAL	
		Challenge	Co-Funds	Challenge	Co-Funds	Challenge	Co-Funds	Challenge	Co-Funds		
RA1	Ngāti Hine	202,400	TBC	210,552	TBC	205,816	TBC	198,258	TBC	\$817,026	0
RA1	UoW	190,756	5,000	375,037	TBC	189,281	TBC	0	TBC	\$755,074	0
RA2	AUT	100,228	0	189,000	0	179,137	0	90,364	0	\$558,729	0
RA3	TTW / PFR / Hapū	111,634	TBC	153,670	TBC	130,199	TBC		TBC		0
RA4	TTW / Independent Contractors	141,326	0	187,649	TBC	115,182	0	21,204	0	\$465,361	0
RA5	Forest Research UK & University of Saskatchewan	35,500	0	85,500	0	67,500	0	17,500	0	\$206,000	0
Integrated Māori Plan		57,500		172,500		\$230,000		\$230,000		\$690,000	1,380,000
TOTAL Challenge \$XXX		839,344		1,373,908							
TOTAL Confirmed Co-funding \$XXX			0		0		0		0		0

Appendix One

Project & Team Selection – To be completed

Identification of Aspirations and Gaps

Based on hui, kōrero, the science plans, reviews, reports and the *Mauri Ora* contract, a list of potential projects was developed. The list was tested against the newly developed criteria for investment by tangata whenua, kaitiaki, kaumatua, knowledge holders, technicians, Ministries (DOC, MPI, MFE), and researchers from Challenge Parties. Their accumulated views and assessments are noted below in table 1.

Table 1: List of potential projects for Mauri Ora

Project	Included	Kōrero	Criteria for Investment				
			1	2	3	4	5
			1=No, 2=Maybe, 3=Yes				
<i>Rongoā solutions for kauri dieback</i>	MR and KDB science plans Independent KDB report Project 1.1	Universally accepted as being a science gap that agencies have failed to procure in the past. It is not without risks including the inability of some rongoā practitioners to; meet so called 'academic standards', write publications, and or manage research projects. Links to NRT Host Pathogen	3	3	3	3	3
<i>Mātauranga Māori</i>	MR, KDB & NRT	Previously a contentious area of conflict	2	3	3	3	3

<i>based seed conservation, germ plasm, and tikanga-based protocols</i>	science plans TTW/DOC/MPI work	between Māori and agencies. An area that mana whenua identified as important in 2017 during the initial MR incursion, and subsequently identified by DOC and MPI as vital. Links to NRT Conservation					
<i>Biosecurity system change – ensuring Māori participation and leadership</i>	MR & KDB science plans Biosecurity 2025 Project 2.4	An area highlighted in both SSAG science plans as vital to the success of any research in these spaces – predominately though as an overseer of wider KDB/MR research (i.e. Kāhui) Links to NRT Mobilising for Action	2	2	3	3	3
<i>Mobilizing communities</i>	KDB & NRT science plans Biosecurity 2025	Universally accepted as being a gap that agencies have failed to adequately resource in the past. Māori we consulted didn't see this as an issue worthy of funding from the Māori specific fund. Links to NRT Mobilising for Action	1	1	2	3	2
<i>Cultural license with regards to forest management and the development of tools and solutions</i>	MR and KDB science plans Urban Battlefield MBIE	Cultural license is always raised as important by industry, stakeholders and non-Māori researchers. Māori not it as important but are clear it should be funded by those developing the tools & solutions Links to NRT Tools (control & cure)	1	1	2	2	3
<i>Mātauranga based tools and approaches</i>	MR, KDB & NRT science plans Biosecurity 2025	Tools and solutions based in mātauranga were raised by almost all Māori groups. There were however different views around its prioritisation and where its funding should come from. Links to NRT Tools (control & cure)	2	2	3	2	2
<i>Cultural health or mātauranga-based indicators (includes incursion impacts on tāngata whenua)</i>	MR, KDB & NRT science plans, Independent KDB review	Noted in all plans as an area that could do with more investment, it has however been procured in the past and at the time of consultation MPI were considering procurement in this area again. Links to NRT Conservation & NRT Risk Assessment	1	2	3	3	3
<i>Mātauranga Māori surveillance</i>	MR, KDB & NRT science plans	Surveillance is an area that Māori are passionate about seeing investment in. It does however have a dedicated theme within NRT. Links to NRT Surveillance	2	3	2	3	2
<i>Kaupapa-Māori conservation & management programmes</i>	MR & NRT science plans, Independent KDB review	An area that Māori have wanted funded more generally for a long time, it simply hasn't been deemed important enough for funding. Links to NRT Conservation	1	3	3	3	2
<i>Mātauranga Māori approaches to resistance in rākau</i>	MR, KDB & NRT science plans Beyond MR MPI-MR Research	An area of importance identified by non-Māori who realise Māori are a vital component of ensuring resistance work is done within culturally appropriate frameworks. Māori see their inclusion as vital but don't rank this mahi above other areas such as rongoā. Links to NRT Host Pathogen	1	2	2	3	3
<i>Understanding healthy forests & their resilience from a Māori perspective</i>	Independent KDB review Urban Battlefield	While not clearly articulated in the SSAG reports, this area of research was raised by Māori a number of times during consultation. We are unclear if it has been procured in the past but it does appear to link to parts of Scion's Urban Battlefield project. Links to NRT Conservation	2	3	2	3	2

<i>Hapū based solutions to Myrtle Rust</i>	MR science plan Project 2.4 Beyond MR MPI-MR Research	An area identified as important by hapū during the myrtle rust incursion in 2017. Its an area that has had funding from across the system but has gaps remaining. Links to NRT Conservation, NRT Host Pathogen, NRT Tools	2	3	3	3	3
<i>Collaborative learning with international indigenous practitioners</i>	MR science plan	This is not an area highlighted in much of the literature but is raised by Māori communities. That is the learnings Māori could gain from indigenous people around the world who have dealt with these incursions and or other, yet to arrive in NZ, incursions. Links to NRT Risk Assessment	3	2	3	2	1

Selection of Investment

Potential projects were ranked according to the score they received during the initial assessment, and then consideration was given to the likelihood of them being funded by other NRT themes. Six projects fell out of that final assessment (yellow highlights in table 2) for consideration in the final *Mauri Ora* plan.

Table 2: List of potential projects for *Mauri Ora* – prioritised by ranking

Project	NRT Themes (other than Oranga)	Score	Selection
1 <i>Rongoā solutions for kauri dieback</i>	Host Pathogen	15	Yes
2 <i>Mātauranga Māori based seed conservation, germ plasm, and tikanga-based protocols</i>	Conservation & Restoration	14	Yes – but shared with Conservation & Restoration if possible
3 <i>Hapū based solutions to Myrtle Rust</i>	Conservation & Restoration Host Pathogen Tools (control & cure)	14	Yes
4 <i>Biosecurity system change – ensuring Māori participation and leadership</i>	Mobilising for Action	13	Yes – but as a system support role as intended in the SSAG science plans
5 <i>Cultural health or mātauranga-based indicators (includes incursion impacts on tāngata whenua)</i>	Conservation & Restoration ; Risk Assessment	12	No – another theme (funded)
6 <i>Mātauranga Māori surveillance</i>	Surveillance	12	No – another theme (funded)
7 <i>Kaupapa-Māori conservation & management programmes</i>	Conservation & Restoration	12	No – another theme (funded)
8 <i>Understanding healthy forests & their resilience from a Māori perspective</i>	Conservation & Restoration	12	Yes
9 <i>Mātauranga based tools and approaches</i>	Tools (control & cure)	11	No – another theme (funded)
10 <i>Mātauranga Māori approaches to resistance in rākau</i>	Host Pathogen	11	No – another theme (funded)
11 <i>Collaborative learning with international indigenous practitioners</i>	Risk Assessment	11	Yes – for consideration
12 <i>Mobilizing communities</i>	Mobilising for Action	9	No – another theme (funded)
13 <i>Cultural license with regards to forest management and the development of tools and solutions</i>	Tools (control & cure)	9	No – another theme

The six projects selected align with those noted in the contract, but also link to work that will be undertaken in

the other NRT themes. Importantly they are broad enough to allow the teams to refine them to address the aspirations of the communities they will work with and or the needs of NRT.

Selected Projects (Research Areas)	Challenge Contract
Rongoā solutions for kauri dieback	Rongoā and Māori-led solutions developed in former Challenge projects 1.1 & 2.4
Hapū based solutions to Myrtle Rust	Enabling hapū/whānau-based projects
Biosecurity system change – ensuring Māori participation and leadership	
Collaborative learning with international indigenous practitioners	
Understanding healthy forests & their resilience from a Māori perspective	Defining 'resilience' for Māori forest health
Mātauranga Māori based seed conservation, germ plasm, and tikanga-based protocols	Defining needs or gaps for work in germplasm and seed banking
	Finalising tikanga-based protocols for seed protection with MPI & DOC
TBC	Critical gaps in mātauranga Māori-led approaches to plant pathogens

Building the right team and connections to deliver the system impact

Leads for each research aim/area (RA) have been selected in accordance with the Challenges guidelines on 'building the right teams' and the criteria given to us by Kevin Prime, Privacy of natural persons, 9(2)(a), and 9(2)(a)

That is the right person for the research is:

- [insert matua criteria]....

Mauri Ora looked for people who aligned with the Challenges values, were known for being inclusive and did not promote competitive behaviour, had capacity, agility and flexibility to move and pivot as required, and the right skillset and experience. This was potentially easier for *Mauri Ora* than other NRT themes because the pool of people with required experience is somewhat smaller.

Project / RA	Assessment and Consideration		
Rongoā solutions for kauri dieback	There were only two real considerations for this project – Privacy of natural persons and Privacy of natural persons . They are the leading rongoā practitioners / tohunga in this space. Everyone else is working from their advice. The key issue for consideration was how to wrap the appropriate support around them so they could deliver to the standards expected from a SSIF platform. They agreed that Privacy of natural persons , who worked with them in project 1.1, was the appropriate person to support them. They also asked for access to TTW support for reporting and publishing. The kaumatua/team became aware of a rongoā researcher at the University of Waikato who had a kauri dieback theory relating to the tohora, and the team reached out to include her mahi in the wider planning of this project.	Skills	Yes
		Experience	Yes
		Connection to hapū / whānau	Yes
		Challenge Values	Yes
		Inclusive	Where appropriate
		Capacity	Yes
		Agility and flexibility	Yes
Lead: Privacy of natural persons & Privacy of natural persons Team: Privacy of natural persons , Kevin Prime, 9(2)(a) i, 9(2)(a) , Privacy of natural persons , research assistant (TBC), kaitiaki & rangatahi (TBC) Other: TTW Support			
Hapū based solutions to Myrtle Rust	There is one name synonymous with Māori and myrtle rust and that is Privacy of natural persons . He has been the loan voice advocating for myrtle rust work with Māori since 2015,	Skills	Yes
		Experience	Yes
		Connection	Yes

	and he recently led Challenge project 2.4 (Māori solutions to myrtle rust) and MPI's Māori myrtle rust programme.	to hapū / whānau	
	Others in the wider Myrtle Rust space considered include: Privacy of natural persons, Melanie Mark-Shadbolt, 9(2)(a), 9(2)(a), 9(2)(a)	Challenge Values	Yes
		Inclusive	Yes
		Capacity	Yes
		Agility and flexibility	Yes
Lead: Privacy of natural persons Team: 9(2)(a), 9(2)(a), Privacy of natural persons and other hapū, kaitiaki, technicians to be confirmed. Other:			
Understanding healthy forests & their resilience from a Māori perspective (Te reo o te waonui a Tāne - the language of the domain of Tāne)	Given there are a large number of Māori who could lead this project, the scope of work considered was narrowed down via kōrero with communities of interest and kaumatua/knowledge holders. Two key themes arose from those discussions: (1) an understanding of vibration and frequency work as its related to the intersections between healthy forest sounds, and the sounds of karakia, waiata, moteatea etc., and, (2) an understanding of bird behaviours as an indication of health or disease i.e. Kākā feeding on cambium as an indicator or MR. Based on the narrower scope Privacy of natural persons was selected for the sound work, and kaitiaki 9(2)(a), and 9(2)(a) self-identified for the bird work – which they have already begun utilising their own resources. We fully expect this work to include kaitiaki and kaumatua, knowledge holders especially 9(2)(a) and 9(2)(a).	Skills	
		Experience	
		Connection to hapū / whānau	
		Challenge Values	
		Inclusive	
		Capacity	
		Agility and flexibility	
Lead: Privacy of natural persons (AUT) Team: TBC but will include Kevin Prime, Privacy of natural persons, 9(2)(a), 9(2)(a) Other: Potential second project - 9(2)(a), 9(2)(a) and 9(2)(a)			
Mātauranga Māori based seed conservation, germ plasm, and tikanga-based protocols (Te mana motuhake a ngā kākano - the sovereignty of	This is not an area that <i>Mauri Ora</i> can fully fund, nor should it. The goal is for the selected team to liaise with NRT Conservation & Restoration in this space and fund only the mātauranga specific work. TTW is the obvious lead for this work because; TTW (Privacy of natural persons, Melanie Mark-Shadbolt, 9(2)(a) & 9(2)(a), MPI (9(2)(a)) and DOC (Privacy of natural persons, 9(2)(a) and others) have already had	Skills	Yes
		Experience	Yes
		Connection to hapū / whānau	Yes
		Challenge Values	Yes
		Inclusive	Yes
		Capacity	Yes

seeds)	conversations about developing tikanga-based protocols for seed conservation. • TTW is a representative member of Frozen Ark and Aotearoa Species – two relevant & related groups and has links to Genomics Aotearoa, Iwi Chairs Data Leadership Group and Te Mana Raraunga. • TTW has been actively working with the Millennium Seed Bank Partnership (Kew), the Australia Seed Bank Partnership and BGANZ on seed conservation initiatives in NZ. • TTW has worked actively with Māori communities to understand their seed conservation aspirations since 2017. TTW will coordinate, via 9(2)(a) a team to work on protocols.	Agility and flexibility	Yes
Lead: 9(2)(a) Team: 9(2)(a), Privacy of natural persons, 9(2)(a), Melanie Mark-Shadbolt Other:			
Biosecurity system change – ensuring Māori participation and leadership <i>(Tuakana-Teina mentoring, engagement and pastoral support across NRT & A critical friend)</i>		Skills Experience Connection to hapū / whānau Challenge Values Inclusive Capacity Agility and flexibility	
Lead: Team: Other:			
Collaborative learning with international indigenous practitioners <i>(A critical friend approach, and international indigenous biosecurity network)</i>		Skills Experience Connection to hapū / whānau Challenge Values Inclusive Capacity Agility and flexibility	Yes Yes Yes Yes Yes Yes Yes
Lead: Privacy of natural persons & Privacy of natural persons Team: Other:			

Appendix Two

Planning for Peer Reviewed Publications (~1 per \$200k)

Project	Lead Researcher(s)	Peer Reviewed Publication(s) Planned	Other publication types
Te whakaora a Ngā Kauri: Rongoā solutions for KDB	Privacy of natural persons	Yes (Up to 3)	Yes – reports, documentary, news media, social media, wānanga information
Te whakaora a Ngā Kauri: Rongoā solutions for KDB	Privacy of natural persons (University of Waikato) & 9(2)(a) (University of Waikato)	Yes (Up to 4)	Yes – reports, news media, social media, wānanga information
Te reo o te waonui a Tāne (the language of the domain of Tāne)	Privacy of natural persons (AUT)	Yes (Up to 2)	Yes - documentary, news media, social media, wānanga information
Hapū solutions to myrtle rust	Privacy of natural persons & 9(2)(a) (Te Tira Whakamātaki)	Yes (Up to 3)	Yes - social media, wānanga information
Te Mana Motuhake a Ngā Kākano: the Sovereignty of Seeds	Melanie Mark-Shadbolt (Te Tira Whakamātaki) & Privacy of natural persons (Independent)	Yes (2-3) First publication under development – case study within a chapter on seed banking in 'Plant Germplasm Conservation in Australia: strategies and guidelines for developing, managing and utilising ex situ collections' (known as the Germplasm Guidelines).	Yes – protocols, best practice guidelines etc., social media, news media, wānanga information
Critical Friend	Privacy of natural persons (Forest Research UK) & Privacy of natural persons (University of Saskatchewan)	No They will publish in the project areas above	Yes, for our communities – news media, social media, wānanga information, brochures

Appendix Three

Data Management

Research project title: Te mauri o te rākau, te mauri o te ngahere, te mauri o te tangata (Mauri Ora)			
Job code(s): 944008-0101		Project duration: 1 June 2019 – 30 June 2020	
Project/Job leader: Privacy of natural persons , Melanie Mark-Shadbolt		Team: Te Tira Whakamātaki Ltd	
Data custodian(s): Privacy of natural persons , Melanie Mark-Shadbolt		Funding agency(ies): MBIE (NSC)	
Research area <i>Short (2-3 lines) description of the project's fundamental aims and purpose.</i> Mauri Ora , is a suite of kaupapa Māori projects that aim to restore the collective health of trees, forests and people, by connecting to and resourcing Māori communities and their environmental knowledge holders to explore solutions embedded in mātauranga Māori (Māori knowledge). These projects are grounded in indigenous knowledge and practices, and will collectively show how mātauranga-led research can contribute to addressing contemporary biosecurity issues while integrating the aspirations of Māori and their communities, and strengthening and sustaining valuable knowledge structures.			

The nature of your data <i>What data is being generated or reused in this research?</i> - Publicly available knowledge sourced through a literature search and review. - Indigenous knowledge/mātauranga will be sourced through interviews with ownership retained by the interviewee. - Mātauranga ecological data, relating to identified case-studies, will also be gathered. - Physical materials or samples maybe collected or created – ownership will be retained by the mana whenua from where the materials and or mātauranga came.
<i>In what file format(s), will you store your data after acquisition (consider if one of New Zealand's Nationally Significant Databases is a suitable repository, and any data format's this may require)?</i> MS Word, Nvivo, MS Excel, digital transcripts and notes, videos/film, sound recordings.
<i>Who owns the data and intellectual property rights arising from your research?</i> It will vary with each dataset, ranging from public data with some element of commercial sensitivity and privacy to Māori owned - either individuals or mana whenua. We will follow (draft) Te Tira Whakamātaki research ethics framework and checklist [see Appendix 1] for each RA and develop a series of cultural safety or mana enhancing agreements that clearly identifies, for each dataset, any sensitivities that limit sharing and ownership status.
Data descriptions (metadata, 'data about data') <i>What metadata will be created or captured and published with the data to make them interpretable and reusable?</i> Mauri Ora will compile an over-arching resource document (MO Data Management Plan) that includes for each project, details on: Interviewer/interviewee affiliations, types of data, location of research, dates, ownership, confidentiality status and accessibility (for future research), where each dataset is archived (in short and long-term) and associated reports and publications. Input into the MO Data Management Plan will be the responsibility of the data management team, coordinated by the programme and RA leads (Privacy of natural persons) Melanie Mark-Shadbolt and 9(2)(a) (Te Tira Whakamātaki), (UoW), (Consultant), (AUT)) and include representation from the HPK-HPM. Where appropriate, data will be published as supplementary material with the resulting publications.
<i>Note any supporting information/documentation that will enhance understanding of the data.</i> N/A
Data access and sharing <i>Will your data be made publicly accessible? If not what restrictions will be imposed, and why?</i> The collaborative nature of this project means that data will be shared between the partners. Data confidentiality agreements will be in place between partners to allow the transfer and storage of sensitive information that is essential to the success of the project Public accessibility will depend on ownership, commercial sensitivity, and privacy issues of the data being collected. We will discuss these issues with each RA leader and log agreements in the Mauri Ora Data Management Plan. Where appropriate, data will be published as supplementary material with the resulting publications.
<i>How will you resolve any data sensitivity (e.g. ethical/privacy/confidentiality) issues that may prohibit sharing some or all of the dataset(s)?</i> Data sensitivity will be discussed with data providers and be mindful of the cultural safety or mana enhancing agreements we have in place. Data can be marked as confidential. All agreements will be logged in the Mauri Ora Data Management Plan and will be in accordance with ethical guidelines (see Appendix 1). An ethics review team will be convened to periodically review any data sensitivity and IP issues. The make up of the ethics team will be agreed with the Challenge.
<i>Will your research data be embargoed for any reason? If yes, provide details.</i> If there is permission to publish project data, the data will be uploaded to a suitable website (e.g. Te Tira Whakamātaki (TTW) and/or the Challenge repository) as and when publications are accepted. Anonymity will be assured in all cases and any identifying features relating to people or place will be removed unless otherwise agreed. Some research data may be embargoed due to commercial/confidentiality issues. This may include anticipated future commercialisation strategies.
<i>What data sharing license do you think is appropriate for this research data?</i> For public information, no license is required. Licenses may be required to access confidential information and will depend on the source of information i.e. archives. We may also need software licenses for data analysis e.g. Nvivo
Short-term data storage and backup <i>Where will you store the data during the project's lifetime? If large data files are anticipated please estimate total size.</i> Partner/institution servers & facilities (i.e. Plant & Food, TTW, iwi/hapū servers (soft) and secure Te Tira Whakamātaki buildings (hard)) will be used to store the data and all details will be logged in the MO Data Management Plan. A shared area hosted by TTW will be used by all Mauri Ora project partners to store ongoing research documents and data (e.g. study plans, ethics agreements, interview protocols, raw data), which will be accessible to the MO data management team.
<i>How (who, where, and how often) will the data be backed-up during the project's lifetime?</i> As per institutional arrangements but typically each system is backed up daily for soft copies; TTW system has a daily back-up.

How will you manage access restrictions and data security during the project's lifetime?

The data management team will work closely with HPK-HPM to periodically review the MO Data Management Plan to ensure data sensitivities and access have been agreed and followed through. We will be seeking guidance from the HPK-HPM with respect to sensitive information.

Data archiving/longer-term storage

How long will or should the data be kept beyond the life of the project?

Interviews are typically kept no longer than 7 years. However, the length they and other data will be kept will depend on the wishes of the data providers. Where data is owned by Māori, we will explore opportunities for the archived data to be accessible for community learning.

Other data, at least as long as it takes for publication of the work, and where appropriate, some data will be made available in supplementary material in publications.

Where will your research data be deposited for long-term preservation and publication? Who is responsible for this?

If permitted and appropriate, we will use a long-term archiving site. Responsibility will fall on the TM data management team. As a knowledge-based organisation, TTW has a vast amount of information that it needs to manage, and as such has Information Security Policies aimed at ensuring long-term data storage in a manner that is appropriate to the owners of the knowledge.

When will your research data be moved to a secure archive for long-term preservation and publication?

Data will be securely archived on completion of each project.

What physical samples/records associated with the electronic data should or will be stored beyond project completion?

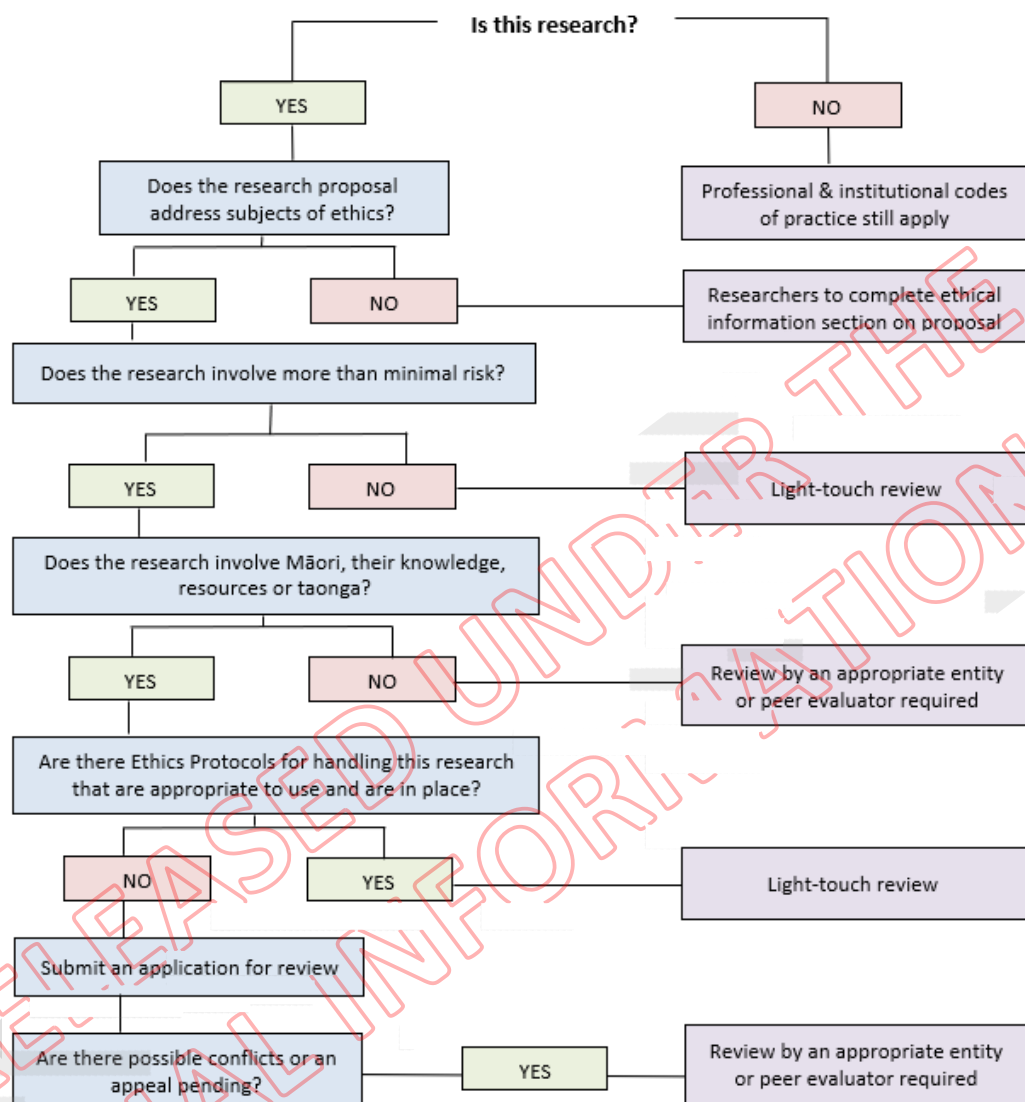
Where physical samples/records arise, the Mauri Ora Data Management Plan will log any samples that may be collected and document storage/accessibility requirements, and will align with individual institute or mana whenua protocols.

Who will be responsible for your data, once you have left your research group?

If appropriately archived on a reputable site and documented in publications, then the responsibility will be with the hosting organisation. The data management team will identify who the hosting organisation will be.

Te Tira Whakamātaki Research Ethics Framework

[Full document to be inserted when complete and approved]

FLOWCHART OF ETHIC REVIEW PROCESS TO DETERMINE LEVEL OF REVIEW REQUIRED**SOCIAL RESEARCH ETHICS CHECKLIST****Why a checklist for social research ethics?**

It is advisable for researchers to routinely check their projects to ensure they are meeting ethical requirements. Checklists both act as an *aide-mémoire* to good research practice, and are frequently required procedure prior to seeking approval from ethics committees. Such protocols are likely to be increasingly employed as standard datasets to ensure compliance with research governance requirements. The following checklist and information form is intended to support ethical considerations throughout a project. Such a checklist prompts the making of clear statements of intent, mechanisms of approach and consideration of hazard arising from research in a manner which can be understood by the public and research professionals alike. While some of the items appear to be beyond the scope of ethics alone, any matter that may affect the success of research is of indirect ethical interest if it may expose respondents or researchers to exploitation or risk.

This form has been designed as a starting guide for researchers who are working independently and so do not have access to an institutional committee-based ethics process. The research ethics checklist has been designed to be particularly relevant for those undertaking participatory, community-based and action research approaches. A similar form, but tailored more specifically to evaluation, can be downloaded from the Learning

for Sustainability ethics page at <http://learningforsustainability.net/research/ethics.php>

How to use this form

A slight-touch review it can be used as a self-check by researchers, or research teams, of their own projects. If you are looking for or required to have something more rigorous, it can serve as the basis for a **peer-review** of your project with one or more external social researchers named as peer reviewers. It is suggested strongly that the review be undertaken in a collegial manner with you (or your team) as project applicant working through the questions with the peer reviewers – either face to face, or using an on-line meeting tool.

Ideally, peer reviewers looking at your project will require:

1. **A completed social research ethics protocol checklist (this form)**
2. **Copies of completed information and consent forms or scripts (if applicable)**
3. **A copy of your full research proposal**

Finally, it is a good idea to also complete a **health and safety register** to show you have thought about these aspects of the research activities included in this application. Health and safety issues need to cover any risks for both participants and researchers.

This form is developed by Privacy of natural persons and Learning for Sustainability, it is free to use, and no attribution is required. It has been modified for our use and will continue to be modified or updated to meet our specific needs.

Please type in the white boxes below each question. Prompts are provided to help with most questions. All boxes are to be completed. Those that don't apply to your project should be completed with N/A.

1.	Project name:
Applicant Details	
2.	Applicant name(s) and role:
3.	Applicants contact details (address, email, phone):
4.	Date by which a decision on this application is required in order that the project can proceed as planned, if approval is required:
5.	Expected date of completion:
Project Information	
6.	Purpose of study: [Aims and objectives might indicate hypothesis testing, policy evaluation, and any potential "value" added to the subject group and/or society in general.]

7.	Does the project require ethical/cultural approval by other bodies? If yes please name the other bodies, and confirm that you have appropriate permissions: [This question asks the proposal writers to identify the relationships that are appropriate. In the first instance researchers should ascertain that there is no established ethics approval process operating within the organizational/institutional environment they are operating in, and that they are required to use. Particular attention needs to be paid to ensure that consideration has been given to the appropriate involvement of indigenous people and other (occasionally left out) groups. It is important to note that, increasingly, these groups may have their own ethics protocols that need to be complied with.]
8.	Will the project require the researchers to be aware of, and use, cultural safety practices? If yes, outline how this will be managed: [Applicants may wish to think beyond national cultures and identities, to also consider how they would engage with other distinct social and professional cultures.]
9.	Sources of funding: [The organization, individual or group providing the finance for the study.]
10.	Identity, skills and experience of field researchers: [Provides an indication of whether the team has the appropriate social research knowledge and experience to undertake the project, or if not, how they will be supported by people with appropriate skills.]
11.	Investigators and their organisation's financial interests, if any, in the outcome of the project:
12.	Design of study – including methodology and methods: [Describe briefly what will be done and how the subjects are to be expected to participate. What will be required of them? All procedural matters should be clarified. Depending on the methodology, steps may be detailed in advance, or set out through a process-led framework. Time commitments and data-collection settings should be revealed. Data analysis methods and procedures should also be clarified. If this study is part of a wider body of work, explain how it links with the wider inquiry including any implications required for ethics consideration.]
13.	Scientific rationale: [Some rationale for conducting the study should be offered. If this investigation has been done previously, why repeat it?]
Participant information	
14.	Types of person(s) taking part as participants: [Who will take part? Why and how will the subject/respondent group be chosen? What sampling techniques will be deployed? Outline selection method, including the approach to stakeholder analysis where appropriate.]

15. Recruitment procedures: [Is there any sense in which subjects might be “obliged” to participate – or are volunteers being recruited? If participation is compulsory, the potential consequences of non-compliance must be indicated to subjects; if voluntary, entitlement to withdraw consent must be indicated and when that entitlement lapses.]
16. How much time will participants have to give to the project? [Need to ensure that this is considerate of stakeholders input and realistic.]
17. Potential benefits and hazards: [What risks to the subject are entailed in involvement in the research? Are there any potential physical, psychological or disclosure dangers that can be anticipated? What is the possible benefit or harm to the subject or society from their participation or from the project as a whole? What procedures have been established for the care and protection of subjects (e.g. insurance, medical cover) and the control of any information gained from them or about them? Are the target group or community in any danger of being over-researched?]
18. Is any deception involved in the study? [This will not be applicable to many studies. It covers things such as the use of placebos in medical research]
19. Confidentiality and anonymity: [Identify how and why decisions about the degree of confidentiality and anonymity to be provided to participants in the project were reached. If the project is promising confidentiality and anonymity detail the steps taken to safeguard the confidentiality of records and any potential identifying information about the subject.]
20. IP Protection – for participants and researchers: [Consideration must be given to ownership of the information, and this should be documented. Particular care must be taken to identify where local and traditional knowledge are being provided, and how their owners’ rights are protected. Also document how the researchers concerned will be using the information, and what the researchers - or wider research team in the case of more inclusive initiatives - will own from the process.]
21. Informed consent: [Consent may be provided in a number of forms depending on the research context. These can include written, oral, and proxy. Justification must be provided on what form is appropriate and why. Where written information is being provided and written consent is required, consent forms must be provided. Where oral consent is asked the basic script should be provided.]
22. How and where will consent forms (if used) be stored?
Data, findings and ethics

23. Data protection and storage:

[The project should comply with the requirements of current data protection legislation and how this is accomplished should be disclosed to participating subjects and those monitoring the research procedure. This should include how and where the consent forms and data will be stored pre- and post-project completion; proposed data storage arrangements, degree of security etc. and whether material facts have been withheld (and when, or if, such facts will be disclosed).]

24. Dissemination of findings:

[What is the anticipated use of the data, forms of publication and dissemination of findings etc? In areas where information is jointly owned by participants as co-researcher's attention should be paid to how they want to use the data.]

25. Are there any plans for future use of the data beyond those already described?

[This should detail whether the data can be stored and used again in the future. Care needs to be taken that any data used in the future can appropriately be understood "in context". Consideration also needs to be given to participants, and how to articulate this in the consent process.]

26. Have you considered how to ensure that ethics considerations are reviewed as the project proceeds?

[This is particularly relevant for projects that go on over a longer time period.]

27. Is there any other information, which you think would be relevant to the reviewers', or your own, consideration of the ethical issues raised in this documentation?

NOTE and DISCLAIMER: This form is provided as a starting guide only for researchers that find themselves having to operate without the benefits of established ethical processes that are commonly found within larger organisations and institutions. It has been designed to cover common social research ethics questions but is provided here on the basis that it may not cover all ethical eventualities. Those undertaking the research that is the subject of this form need to undertake their own further assessment of ethical considerations for their particular project and add other issues as appropriate. Similarly, peer reviewers, if used, may also suggest additional considerations.

DECLARATION

The information supplied above is to the best of my knowledge and belief accurate.

Signature of Applicant:

Date:

PEER ASSESSMENT (If applicable - Social research peer reviewers to complete)

We(Names of peer reviewers)..... have reviewed the above project in discussion with(Name of proposer)..... and in our view:

- ☐ Approval is given for the project to proceed as documented
- ☐ The proposal requires further consideration of ethics issues

Signature(s):

Date:

[Note: If you wish to use this peer review formally then some thought will have to be given to ensure the credentials and independence of your reviewers. Other people will at the least need some way of verifying the reviewers – perhaps through their website pages. If it is to be used formally, as well as being a supportive peer review process, then the reviewers also need to be comfortable with being contacted about their review.]

Appendix Four

Research Linkages Detailed

These projects, especially RA's 1, 3 & 4, build off of previous Biological Heritage NSC projects, especially project 1.1 Mātauranga Māori characterisation of biodiversity, and project 2.4 Māori solutions for biosecurity risks, but also the seed conservation work done in collaboration with Te Tira Whakamātaki. Additionally, the myrtle rust work (RA3) builds off of the work done in the MPI funded Myrtle Rust programme.

This work also links to the Kauri Dieback Science Plan, specifically whakapapa priorities within theme 4.4: Mātauranga Māori solutions for kauri dieback, which sit within theme 4 Te Ao Māori theme. Under whakapapa - determining what we can learn from the resilience of kauri relatives and their kaitiaki in the Pacific, and determining whether the lineage of kauri offers us insight into alternative hosts, sentinels, defence, solutions etc. Theme 4.5 control and management (under Te Ao Māori) considers rāhui and rongoā solutions as high priority needs, as does 6.2.(j) and in part 2.2(b) mapping the genetic diversity of kauri.

More to come – links to Myrtle Rust Science Plan

Alignment with Plant Pathogen Scoping Group:

As noted earlier (and further in appendix four) the Oranga section of the NRT Scoping Panel Report highlighted the need for research to be Kaupapa Māori-led, to explore explicit mātauranga solutions such as rongoā, and be underpinned by maramataka (Māori lunar calendar). More specifically it noted the need for the Oranga workstream to include social science and mātauranga Māori research lead by teams of Vision Mātauranga experts. It notes the need to partner with mana whenua, connect to previous research and support kaitiaki and rangatahi. These elements are embedded throughout the proposed annual workplan.

Alignment with SSAG Science Plans:

Both the Myrtle Rust and Kauri Dieback Science plans specifically identify the importance of enabling Mātauranga Māori as a key strategic priority for New Zealand science. There is a strong commitment to work in partnership with Māori communities and fund Māori-led research and tool development. Crucial areas for development include the promotion of Māori leadership and participation in plant disease research as well as improving capacity and capability. There is much work to be done also on building trust between Māori

communities and current research organisations and funding systems. For further information on how this annual workplan aligns with the SSAG science plans see appendix four.

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OFFICIAL INFORMATION ACT