Research Proposal Template

A. PROJECT TITLE

Tāhuhu Matatau Te Ao Tangaroa: *empowering the kaitiaki of Ngā Whare Tokotoru ki Katikati with mātauranga from Aotearoa and beyond*

Sustainable Seas Challenge, Tangaroa Programme (Project 3.1.3)

B. PROJECT TEAM

Project Leader:	**Investigators:**
Dr Anthony O Cole, *iPansophy Limited* *33 Philomel Crest* *Welcome Bay,* *Tauranga 3112* *0064-6-3591035*	*Dr Anthony O Cole, iPansophy Limited,* *Prof. Chris Battershill, Waikato University* *Caine Taiapa, Manaaki Te Awanui,* *Waiaria Rameka, Manaaki Te Awanui,* *Vanessa Taikato, Manaaki Te Awanui,* *Aaron Cole, Epiphron Limited*

C. ABSTRACT

In this research project, the Manaaki Te Awanui research team will work collaboratively with local kaitiaki and participating hapū to: (i) review Western Science (WS) literature in domains relating to marine ecology, spatial planning, real-time monitoring and aquaculture to (ii) identify, prioritise and validate areas of relevance and possible data/knowledge gaps while (iii) mediating the transfer of approaches, frameworks and tools to frontline kaitiaki via the development of an online training programme and resource centre[1].

Over the last 8 months, the Māori research team at Manaaki Te Awanui (MTA) have developed a new model of hapū engagement (based on wānanga) aimed at *empowering 4 participating hapū and kaitiaki (teams) of the Tauranga Moana* so they can enhance their expression of kaitiakitanga. This team is guided by the board of MTA, local kaitiaki, Caine Taiapa (team leader) and Dr Anthony Cole. In this new approach to hapū engagement, the expression of kaitiakitanga is based on reclaiming and reframing Mātauranga Māori in order to re-instate the mana of the Tauranga Moana and participating hapū (i.e. a focus on Tangata and Atua/Whenua wellbeing). These wānanga are supported by marine ecosystem-based monitoring activities including: GIS-based

[1] MTA was created to support the hapū and frontline kaitiaki of the Tauranga Moana, to build local Māori educational and research capacity and to provide a 'vital' link to Western Science (WS) knowledge, data, frameworks and tools. Thus, the research team at MTA are able to confidently move back and forth between WS and Mātauranga Māori knowledge traditions.

Habitat mapping, near-shore and open-water sea floor (transect-based) of customary kaimoana sites with camera and survey equipment. All wānanga activities are digitally recorded (ref. Appendix 1 for IP arrangements) to create a Pātaka Mātauranga that hapū and kaitiaki can use for education, research, future co-management and planning activities. There is a strong desire on the part of kaitiaki and hapū to grow this initiative in ways that strengthen current investigative and analytical approaches to better understand how the learnings of Western science can 'empower' the expression of kaitiakitanga in the domain of Tangaroa.

To date, 7 key questions (ref. Table 1, page 5) have emerged from wānanga, hikoi and monitoring activities that form the basis of this proposal. These questions provide 7 themes that will prioritise and guide our review of western scientific literature in search for data, information, knowledge, frameworks (conceptual, theoretical and mathematical) and tools that can be used to empower and support the work of our frontline kaitiaki. The research team at MTA will ensure that the transfer of benefits from WS to frontline kaitiaki is 'empowering' by mediating the transfer process (i.e. filtering, translating, re-packaging, re-purposing, contextualising, prioritising and effectively communicating). Learnings from the design and operation of this cross-cultural 'mediation/transfer process' will provide an additional knowledge outcome to this project.

Simultaneously, an online 'kaitiaki' training programme will be developed that is 'fit-for-purpose' and able to be customised to differing hapū contexts locally and nationally. This training programme will be based on a step-by-step, ako-based (learning) approach that will make it possible for frontline kaitiaki to customise their learning experience towards (a) scoping or (b) deep learning modes so as to ensure that the 'adoption' and 'uptake' of WS data, information, knowledge, frameworks and tools can be 'fitted' to the short-term priorities and/or long term goals of frontline kaitiaki activities.

D. INTRODUCTION

Over the last 8 months, the Māori research team at Manaaki Te Awanui (MTA) have developed a new model of hapū engagement (based on wānanga) aimed at *empowering 4 participating hapū and kaitiaki (teams) of the Tauranga Moana* so they can enhance their expression of kaitiakitanga. This team is guided by the board of MTA, local kaitiaki, Caine Taiapa (team leader) and Dr Anthony Cole. *This new kaitiaki/hapū engagement process builds on experience from 3 previously Crown funded research programmes (IES-Iwi Ecosystem Services (MAUX0503), MTM-Manaaki Te Moana (MUAX0907) and OTOT-Oranga Tangata, Oranga Taiao (MBIE PROP-42344-ETR-MAU)) combined with an extensive review of published written oral history and Mātauranga Māori from Pūkenga Māori working in the Western academy). So far, this engagement approach has exceeded our initial expectations and shows signs of being able to deliver a future research contribution of 'National significance'. Our plan is to enhance this engagement process with benefits from Western Science (WS) as outlined in this 'Tāhuhu Matatau Te Ao Tangaroa' proposal. <u>This research activity has grown out of our involvement in the OTOT research programme, however further development of this engagement framework is outside the scope of OTOT and for this reason cannot be funded by OTOT. This proposal seeks resources to continue the development of this engagement initiative.</u>*

In this new approach to hapū engagement, the expression of kaitiakitanga is based on reclaiming and reframing Mātauranga Māori in order to re-instate the mana of the Tauranga Moana and participating hapū (i.e. a focus on Tangata and Atua/Whenua wellbeing). *The Mātauranga Māori dimension of the current engagement process is adequately supported. What is currently missing is the dimension that can be provided by WS. An interesting question concerns just how to transfer the benefits of WS into a Māori cultural context. We will*

design a 'benefit transfer' mediation process and online learning programme that draws on 5 years of teaching WS knowledge (e.g. economics, ecology, accounting, theology, research techniques) to second chance learners in Whare Wānanga (i.e. Te Wānanga-o-Raukawa and Te Whare Wānanga o te Pīhopātanga o Aotearoa). The academic skill-based within our MTA team includes statistics, GIS, full-cost accounting, dynamical systems and system dynamics modelling. This means that we are well positioned to explore the transfer of WS spatially datasets and associated modelling frameworks.

These wānanga are supported by marine ecosystem-based monitoring activities including: GIS-based habitat mapping, near-shore and open-water sea floor (transect-based) mapping of customary kaimoana sites with camera and survey equipment. *Five of the 6 research team members at Manaaki Te Awanui have undergraduate training in marine ecology and 5 are well-experienced in marine ecosystem research including lab-work, taxonomic ID, diving and related fieldwork. While our current kaitiaki/hapū engagement process primarily focuses attention on reclaiming and reframing Mātauranga Māori relating to the Tauranga Moana, hapū are aware that the rapid decline in kaimoana over the last 15 years is driven by causes that fall outside of the methods (cf. tikanga) and scope of local Mātauranga. The MTA research team have already begun utilising WS research frameworks, tools and techniques in surveys of customary kaimoana sites. This proposal provides a concrete strategy and pathway for growing what we are already doing into areas that include: (i) understanding marine ecosystem behavioural baselines, disturbance causality and ways to (ii) mitigate, remedy, offset and avoid effects while (iii) providing commercial opportunities for hapū (e.g. aquaculture, the creation/modification of value chains).*

All wānanga activities are digitally recorded to create a Pātaka Mātauranga that hapū and kaitiaki can use for education, research, future co-management and planning activities. There is a strong desire on the part of kaitiaki and hapū to grow this initiative in ways that strengthen current investigative and analytical approaches. *Our engagement with and research on behalf of local kaitiaki and hapū is digitally based. Thus, our research team is well positioned to successfully complete this proposal (ref. Appendix 1 for IP arrangements).*

E. AIMS

The aims of this research project are outlined below:

(i) Growth (Whakatiputipu) - to grow the *current research activities* of the Māori research team at Manaaki Te Awanui to the point where they are able to effectively and successfully mediate the transfer of WS knowledge, frameworks, tools and data to local frontline kaitiaki within the Tauranga Moana as a first step towards future National deployment (Appendix 2).

(ii) Grounding (Tumu) - to guide our review of WS literature, data, models and tools by initially preferencing 7 thematic areas that are directly related to questions that have emerged from our current engagement process and fieldwork (to-date).

(iii) Mediation (Mātauranga takawaenga) - to create and refine a mediation process that can be used to filter, translate, re-package, re-purpose, contextualise, prioritise and communicate WS knowledge, frameworks, data, models and tools etc. to frontline kaitiaki.

(iv) Real-world testing (Te Ao mārama) – to work with local kaitiaki to validate and where necessary/appropriate to real-world test WS knowledge, frameworks, models and tools within the Tauranga Moana.

(iv) Agile development (Moruki whakawhanake) - to employ an agile development cycle (i.e. source, create, end user-test, evaluate and refine–repeat cycle) to build an online training and

resource Pātaka for frontline kaitiaki and employ the use of this tool with local kaitiaki as a first step towards future National deployment (Appendix 2).

F. PROPOSED RESEARCH

This section provides a stepwise outline of our research method and methodology. Concerning method, a stepwise visualisation of the engagement process used in our current Wānanga with the kaitiaki and hapū of the Tauranga Moana is depicted in Figure 1. We have adapted this engagement process to include a framework for validating and mediating the transfer of benefits from WS. This process was developed with local kaitiaki for reclaiming and reframing Mātauranga Māori and has proved to be very successful. This project proposal provides an opportunity to enhance this process with elaboration of steps 2. In the process depicted in Figure 1, the final validation and decision to adopt WS methods lies with frontline kaitiaki. Strengthening and developing this framework is an important preparation for future co-management and co-governance arrangements for the Tauranga Moana that will exist as part of the Crown's deed of settlement with Tangata Whenua.

Funding for sustainable seas project 3.1.2 has been targeted towards the Nelson Bays as the primary case study rohe for this first phase of this challenge. This research proposal provides an opportunity for an additional 'Tauranga Moana' case study for *Sustainable Seas Challenge, Tangaroa Programme (Project 3.1.2)* that is closely linked to the Te Tau Ihu Nelson Bays case study. A number of cross-programme/institutional linkages exist for bringing together the Te Tau Ihu and Tauranga Moana case studies. First, Cawthron Institute (Nelson) is a research partner in the current MBIE funded OTOT research programme that this proposal builds on. Second, Dr Cole is a 'placement' in an MBIE funded Vision Mātauranga research programme with Wakatū Incorporation who are one of the partners in the Te Tau Ihu 'Tangaroa' (Project 3.1.2) programme. Thus, potential exists to develop a close working relationship between these two case studies.

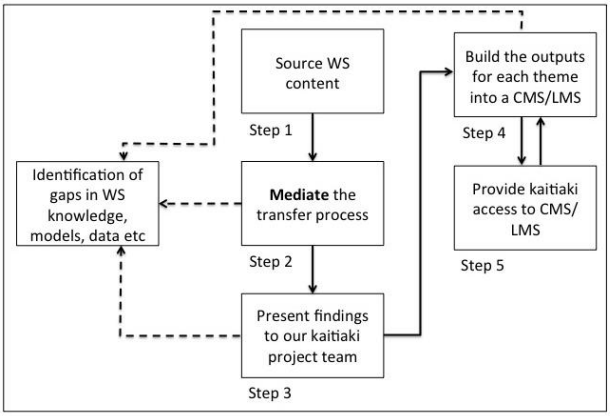

Figure 1 *A stepwise illustration of our proposed method for validating and communicating each theme*

Concerning methodology, the engagement process outlined in Figure 1 draws on (i) a decade of Crown funded, hapū-led and wānanga-based experience in research (cf. whakatupu Mātauranga), (ii) an extensive review of literature on the development of kaupapa Māori, and more generally indigenous research methodology and (iii) wānanga with local hapū and kaitiaki to establish the Pou Matua that guide the process depicted in Figure 1. In summary, our research methodology draws primarily on a kaupapa Māori epistemology and can be theoretically positioned in close proximity to strong transdisciplinarity (i.e. the emerging epistemological frontier of WS).

This proposal focuses attention on elaboration of Figure 1 associated with step 2. A stepwise, visual depiction of Figure 1, step 2 is shown in Figure 2 and provides a detailed outline of our proposed process and method for 'mediating' the 'transfer of benefits' from WS. The elaboration depicted in Figure 2 was created to address the question of how to transfer (cf. move) knowledge, frameworks, data, models and tools from WS into the domain of Te Ao Māori in a way that empowers kaitiaki/hapū and thus supports whakatupu mātauranga, māramatanga and mōhiotanga. A written explanation of the various steps contained in Figure 1 and 2 is provided below.

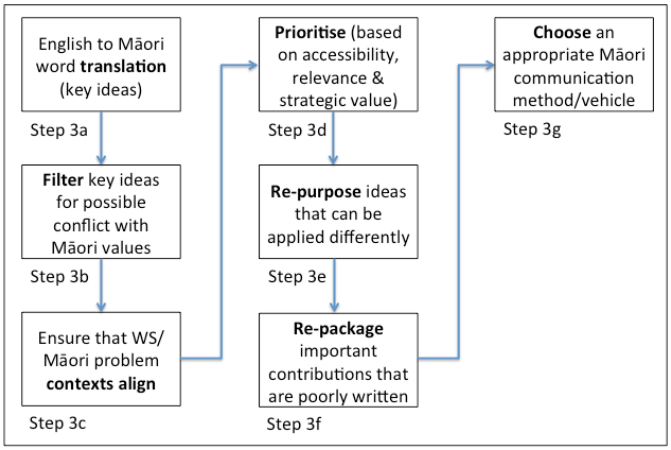

Figure 2 *A stepwise illustration of our proposed method for mediating the transfer of WS benefits to frontline kaitiaki*

The method depicted in Figure 1 provides a process for (i) validating the transfer of benefits from WS and (ii) the identification of gaps in WS knowledge, models, frameworks, tools and data associated with real-world problems confronting our hapū and frontline kaitiaki. Steps 1-5 of Figure 1 are parts of a cycle that will be completed 7 times during the course of this project (i.e. 1 complete cycle for each of the 7 research themes) identified by local hapū, kaitiaki and survey activities as being important to the wellbeing of the Tauranga Moana). The 7 research questions and themes for investigation in the academic literature of WS are outlined in Table 1.

Table 1 *A list of hapū/kaitiaki questions and implied WS research themes that we will use to prioritise and guide this research activity*

Hapū/kaitiaki question	**WS research theme**
1. How are all things causally related in the domain of Tangaroa?	How might a marine ecosystem based (EB) approach be used to help hapū and kaitiaki better understand how things are causally related in the domain of Tangaroa?
2. How do we avoid, remedy or mitigate adverse effects like over harvesting, sedimentation, climate change and pollution in the domain of Tangaroa?	*How might the tools, methods and frameworks developed in WS to plan for marine ecosystems enhance the expression of kaitiakitanga?*

3. Given rapid decline in kaimoana over the last 15 years, how do we sustain our customary harvesting practices and the cultural values associated with the same (e.g. employment, education, manaakitanga)?	How might emerging WS developments in 'full water column' aquaculture assist hapū *enhance the expression of kaitiakitanga?*
4. Why are our taonga species numbers and distributions rapidly changing and what can we do to address this problem?	H*ow can marine ecosystem thinking help kaitiaki to understand the causes of rapid changes that they have noticed in the numbers (cf. abundance) and distributions of their taonga species in the domain of Tangaroa?*
5. What emerging technologies help us to map and depict our places of customary harvest so that we can better express kaitiakitanga?	What tools, technologies, methods, models and/or frameworks can WS provide that kaitiaki can use to sustain customary harvest?
6. What are examples of the effective co-management of Tangaroa that we can use to help us prepare for future co-management and co-governance arrangements?	What can western science provide that will help kaitiaki to prepare for future co-management and co-governance arrangements?
7. Which whānau of Tangaroa (cf. marine species) exist in our moana, what types of changes in marine conditions are they sensitive to and how do their life cycles work?	What resources are available that will assist kaitiaki to build understanding about marine species?

Stepwise wānanga engagement method explained (Figure 1)

Step 1 (Figure 1) – before engagement with local kaitiaki (Step 3), we will source appropriate WS knowledge for the particular research question or theme being explored (Table 1).

Step 2 (Figure 1) – mediate the transfer process (ref. Figure 2 for details).

Step 3 (Figure 1) – present findings of step 2 to our frontline kaitiaki. Evaluate findings of step 2 and create a list of priorities and peer review recommendations. These meetings may also involve invited guest speakers from WS or other Sustainable Seas programmes to present/demonstrate their learnings, models or tools etc (ref. to linkages and dependencies Table). Digitally record these workshops and the presentations given to aid the development of CMS/LMS content.

Step 4 (Figure 1) – use the evaluation and peer review findings of 'Step 3' to build content for the CMS/LMS. Upload this content to a CMS/LMS that is custom built for this project.

Step 5 (Figure 1) – provide kaitiaki secure access to the CMS/LMS so they have an opportunity to (i) use this new training platform/material and (ii) provide additional feedback during our ongoing, kaitiaki workshops/meetings (i.e. step 3).

Stepwise cross-cultural mediation method explained (Figure 2)

Step 3a (Figure 2) – all collected papers will be reviewed and where appropriate carefully read. In this reading process, key ideas will be translated from English into Māori as a means of evaluating potential for the linguistic transfer of 'meaning'. Successful materials will advance to step 3b.

Step 3b (Figure 2) – all key ideas and related papers/books/resources will be filtered using well-established Te Ao Māori models (e.g. the wharenui model, te whare tapa whā etc) to identify points of possible conflict with kaupapa tuku iho, Atuatanga, taonga tuku iho. Where possible, efforts will be made to resolve emerging tensions. Successful materials will advance to step 3c.

Step 3c (Figure 2) - all key ideas, frameworks, models, data and tools will be evaluated to ensure that WS and hapū/kaitiaki problem contexts are able to be aligned, especially in a way that upholds key assumptions and axioms. Successful materials will advance to step 3d.

Step 3d (Figure 2) – successful papers/books/resources will be prioritised based on key criteria like accessibility, relevance and strategic value. This classification process will make it easier for frontline kaitiaki to select materials based on their priorities and desire to scope or more deeply study materials. Classified materials will advance to step 3e.

Step 3e (Figure 2) – in some cases, WS may have applied key ideas, frameworks, models, data and tools in ways that are not of direct interest to hapū or kaitiaki. However, hapū and kaitiaki may well be able to think of ways of applying the same key ideas, frameworks, models, data and tools in ways that WS has not considered. Outcomes of this kind may be achieved by a process of repurposing *key ideas, frameworks, models, data and tools.* Materials that have been repurposed or do not require repurposing will advance to step 3f.

Step 3f (Figure 2) - in some cases, WS may have created key ideas, frameworks, models, data and tools that have been poorly packaged in written terms and are thus unsuited for use by hapū or frontline kaitiaki. If such a written contribution is considered to be of value to hapū or frontline kaitiaki, there may be a need to 'repackage' it. In some cases, this may involve elements of rewriting and reconstructing. After screening for repackaging, materials will advance to step 3g.

Step 3g (Figure 2) - successful papers/books/resources, key ideas, frameworks, models, data and tools will be communicated to hapū and frontline kaitiaki in an appropriate communication vehicle. Our preferred form of communication is oral presentation supported by appropriate visual materials (i.e. video), because this can be easily recorded stored and reused in a learning/content management system. However, where appropriate other communication aids will be considered. All copyright restrictions will be adhered to.

It is our expectation that this research method will make it possible to create an online training product that can be validated locally with a view to being deployed nationally (Appendix 2) in the future (pending further developments where needed). We also fully expect that this research journey will contribute to better understanding of: (I) problems that prevent the successful transfer of knowledge across cultural and worldview boundaries, (ii) gaps that exist in WS research/knowledge and (iii) opportunities that exist to build and develop tools that will more effectively mediate the movement of knowledge across linguistic/cultural/worldview boundaries.

G. RESEARCH ROLES

Researcher	Organisation	Contribution
Caine Taiapa	*MTA*	*Team leader (MTA)* *Relationship manager (hapū/kaitiaki)* *Researcher (marine ecology, mātauranga Māori)*
Anthony Cole	*iPansophy Limited*	*Science leader* *eLearning/CMS/LMS development* *Researcher (theoretical ecology, mathematical modelling mātauranga Māori)*
Waiaria Rameka	*MTA*	*Project administrator (MTA)* *Researcher (marine ecology, mātauranga Māori)*
Vanessa Taikato	*MTA*	*Researcher (marine ecology, mātauranga Māori)* *Laboratory technician*
Aaron Cole	*Epiphron Limited*	*Web development* *ICT technical support*

H. LINKAGES AND DEPENDENCIES

The 7 hapū/kaitiaki questions that have been used to created WS research theme for this project afford opportunity to *link* this proposal to existing project outcomes and outputs as outlined in Table 2. However, these linkages do not involve critical dependencies for this project.

Table 2 *Linkages for the transfer of learnings from other Sustainable Seas programmes to this programme.*

WS research theme and number	**Linkages to sustainable seas programmes**
1. How might a marine ecosystem based (EB) approach be used with ecosystem modelling tools to help hapū and kaitiaki better understand how things are causally related in the domain of Tangaroa?	Dynamic seas 4.1.1 Ecosystem Connectivity: Tracking biochemical fluxes to inform Ecosystem Based Management Dynamic seas 4.2.1 Tipping points in ecosystem structure, function and services Dynamic seas 4.2.2 Stressor footprints and dynamics
2. How might the tools, methods and frameworks developed in WS to spatially depict, value and plan for marine ecosystems, aid hapū and kaitiaki to avoid, remedy or mitigate adverse effects like over harvesting, sedimentation and	Valuable seas - 2.1.3 Measuring ecosystem services and assessing impacts Valuable seas - 2.1.2 Mauri Moana, Mauri Tangata, Mauri Ora - Documenting social values

pollution in the domain of Tangaroa?	Valuable seas - 2.1.1 The development of valuation frameworks and principles
3. How might emerging WS developments in 'full water column' aquaculture assist hapū to replenish kaimoana, mitigate the causes of decline in customary harvest, re-instate the mana of Tangaroa and rebuild traditional lines of employment based on the modification of existing value chains or the creation of new value chains?	Valuable seas - 2.2.1 Creating value from a blue economy Tangaroa - 3.1.1 Hui-te-ana-nui: Understanding kaitiakitanga in our marine environment
4. How can the population, community and/or ecosystem frameworks of WS help hapū and kaitiaki to understand the causes of rapid changes that they have noticed in the numbers (cf. abundance) and distributions of their taonga species in the domain of Tangaroa?	Dynamic seas 4.2.1 Tipping points in ecosystem structure, function and services Dynamic seas 4.2.2 Stressor footprints and dynamics
5. What tools, technologies, methods, models and/or frameworks can WS provide that kaitiaki and hapū can use to historically reconstruct, digitally map and monitor (in real time) their places of customary harvest in ways that provide early warning of emerging problems indicating change in well-established baseline conditions?	Managed seas 5.1.1 Ecosystem models Managed seas Spatially explicit decision support tools Vision Mātauranga 4.1 A repository of knowledge: Mātauranga Māori
7. Can WS studies into marine species taxonomy and zoology help hapū and kaitiaki to learn about the environmental preferences and life cycles of the many marine species within the Tauranga moana?	Tangaroa - 3.1.1 Hui-te-ana-nui: Understanding kaitiakitanga in our marine environment

I. RISK AND MITIGATION

Given our experience over the last 10 years in working in hapū-led projects of this kind, our assessment is that, overall, the level of risk associated with this project is low. We have identified the following risks and remedies that drawn from our past experiences:

1. Programme governance

Problem – in past contract research activities involving Tangata Whenua as participants or partners, it was considered important to establish a programme level mana whakahaere or governance group. In our experience, this arrangement has (on balance) proved to be more problematic than beneficial because it is highly sensitive to personalities. Once a formal governance arrangement is set in place, it is very difficult to change if problems arise

Risk level – low

Remedy – our current wānanga engagement process is based on what might be described as a loose coupling of governance (i.e. different kaitiaki from participating hapū entities come together for governance meetings on an as-need basis). We have found that this model works very well as it is based on shared responsibilities and a flexible arrangement that can be changed if need be.

2. Loss of key staff

Problem – a key, senior Māori staff member leaves the research programme

Risk level – low-medium

Remedy – employing an alternative would be a desired remedy to cover the loss of such an individual. Failing this, the fall-back position would be to contract in a senior Māori researcher from one of the CRIs[2].

3. Failure to meet a milestone deadline

Problem – socially mediated engagement processes do not always run to schedule. They can be dramatically influenced by unplanned events like tangihana or adverse weather patterns.

Risk level – low

Remedy – the research team and kaitiaki are proactive in carefully planning engagement processes so as to mitigate potential problems and delays wherever possible. In the case that delay or a problem (e.g. adverse weather conditions) is unavoidable, we will maintain regular and effective communication with MBIE staff so that alternative arrangements can be made if they are needed.

4. Unplanned disruption to the work schedule

Problem – a significant, unplanned disruption event occurs

Risk level – low

Remedy – the kaitiaki and research teams use a pre-cautionary planning strategy that includes ongoing scanning for emerging problems. Detection of a disruptive event will be managed by kaitiaki and the project team based on close communication with MBIE staff.

[2] Nationally, there are relatively few senior, experienced, Māori academics working with hapū/iwi in the terrestrial/marine/aquatic domains who have the breadth of experience, academic and cultural skills needed to work in a way that builds capacity for Māori while undertaking concrete research activities.

5. Computer system failure

Problem – a computer system failure results in loss of mission critical data

Risk level – low-medium

Remedy – all project-critical information is backed up both onsite and offsite in Cloud storage

6. Mission creep

Problem – successful outcomes in socially mediated processes can result in a desire on the part of stakeholders or participants to want to move beyond contracted goals. On one hand we want to encourage creativity and innovation. On the other hand, care is needed to ensure that existing contractual obligations are fulfilled.

Risk level – low

Remedy – the project team and kaitiaki are aware of the need to manage programme activities within budget scope. A workshop will be run that explains how funded research programmes are created and managed. The aim of this workshop will be to proactively raise awareness of the processes to be followed, support mechanisms available and time need to raise funding to seed new project ideas. The staff at MTA are also discussing plans for the creation of a centre of innovation that will assist in the the area of supporting hapū/kaitiaki by providing a 'concrete pathway' for moving innovative ideas from research to prototype to value chain stages.

J. ALIGNED FUNDING AND CO-FUNDING

This proposal is one strand of a number of research activities that are strongly aligned with each other and involve numerous opportunities for leveraging of funding and benefits across projects.

Current research funding alignment

MTA is the contract entity for the involvement of Tauranga Moana hapū in the MBIE funded Oranga Taiao, Oranga Tangata (OTOT) research programme that aims to develop toolsets to assist Iwi and Hapū with the co-management of Estuaries. The lead contract organisation (Science leader Prof. Murray Patterson) for this MBIE funded research programme is Massey University who have provided *in kind support* including the use of facilities at the Palmerston North Campus and access to the University Library and online journals estimated at $25,000 per year. A further partner to the OTOT research programme is Cawthron Institute who have also provided ongoing *in kind* training support for our staff, use of their lab and taxonomic ID facilities/staff in Nelson estimated at $18,000 per year.

MPI has provided funds ($42,000) to work with *Ngā Whare Tokotoru ki Katikati* in order to undertake a "State of the Takiwa" investigation with hapū as a preparation for the creation of estuarine iwi management plans.

BOP Regional Council (Tauranga Office) has agreed to provide funding support for local hapū to create iwi management plans including an additional $10,000 to cover the costs of wānanga need to mediate the create of such plans.

Annually, MTA receives ca. $20,000 per year in funds to support estuarine management activities with local hapū

As part of collaborative teaching and research activities between Waikato University and MTA, the University provides the staff team of MTA office accommodation, utilities (i.e. power, water), conference, laboratory and workshop facilities that support marine ecosystem research activities. This in kind contribution is valued as an annual contribution exceeding $26,000. The MTA research team also benefit from having Professor Chris Battershill as a mentor and supervisor for ongoing Postgraduate study activities (Masters) by our staff.

Local kaitiaki and hapū also make annual in kind contributions towards the research activities of MTA that we estimate to be in excess of $24,000 per year for use of marae facilities for meetings and wānanga and unpaid contributions of time.

Emerging research funding alignment

MTA will submit a proposal to Sustainable Seas (Tangaroa) project 3.3.2 to further support the development of pathways to co-governance/co-management of estuaries. Our involvement in project 3.3.2 is a real-world necessity as the hapū of the Tauranga Moana will enter into the co-governance/co-management of the Tauranga Moana as part of a future Treaty Settlement. The OTOT research programme and our Wānanga engagement model have been developed in an effort to build capacity for hapū involvement and leadership in this area.

MTA will submit a proposal to Sustainable Seas (Valuable Seas) innovation fund to support local hapū to explore aquaculture as a means of sustaining cultural harvest, growing local employment and re-instating the mana of the Tauranga Moana by mitigating land use effects including GHG emissions.

MTA will also be applying to the Māori ICT fund to support the development of our marine ICT centre of innovation project.

K. VISION MĀTAURANGA (VM)

This research proposal contributes directly to all 4 Vision Mātauranga research themes as follows:

(i) Indigenous innovation – the objective of this theme is to *"create distinctive products, processes, systems and services from Māori knowledge, resources and people through distinctive R&D activities".*

The participating hapū of the Tauranga moana would like to re-instate their customary kaimoana gathering practices. This is not currently possible and it appears that human population pressure (i.e. over-harvesting) and land-based economic activities producing detrimental effects (e.g. pollution, sediment and nutrient loading and the release of toxic chemicals) are primarily to blame for steady decline in the presence and wellbeing of taonga species within the Tauranga moana. Hapū desire to move beyond the 'management of economic effects' to a 'value-based' (cf. kaupapa tuku iho) model of economic activity (based on the expression of kaitiakitanga) that creates wealth and jobs for local communities ***while delivering flows of ecological benefits to the Moana and terrestrial ecosystems at the same time.*** Our initial investigations indicate that this vision of creating a distinctly Māori blue/green economy is achievable. This proposal will empower hapu and kaitiaki to make concrete, strategically important steps towards the realisation of this vision.

(ii) Taiao – The objective of this theme is to *"discover distinctive and successful approaches to environmental sustainability by exploring iwi and hapü relationships with land and sea, and*

kaitiakitanga – an emerging approach to environmental management on the basis of traditional values, principles and concepts".

The participating hapū of the Tauranga moana have recognised that many of the unsustainable, detrimental effects on the wellbeing of the Tauranga moana fall outside of what might be considered as the expression of kaitiakitanga by our tūpuna (pre-1840). In order to address the complex web of cause and effect relationships responsible for the decline of our customary fisheries over the last 15 years, hapū seek to (i) reclaim the expression of kaitiakitanga by our tūpuna and (ii) reframe it a modern-day, mixed economic, co-management/co-governance context. This will mean taking our expression of kaitiakitanga to a very new level. To achieve this goal, hapū seek to up-skill and support the education of tamariki/rangatahi, harness the opportunities provided by rapidly emerging technologies and draw on the learnings of WS to help them understand and address problems created by the Western economic model. This research proposal contributes towards re-framing and re-instating our expression of kaitiakitanga by providing opportunities to: (i) connect with the learnings and technologies of WS and (ii) develop culturally mediated pathways for the transfer of WS benefits to our frontline kaitiaki and hapū as a ***first step towards the realisation of this Taiao Māori vision.***

(iii) Hauora/Oranga – The objective of this theme is to "discover successful (including distinctive) approaches and solutions to Māori health and social needs, issues and priorities".

The participating hapū of the Tauranga moana recognise that their own wellbeing is inextricably connected with that of the Tauranga moana. Decline in the wellbeing of customary fisheries over the last 15 years finds a corollary decline in the oranga of whānau across a range of well-established Māori wellbeing indicators (i.e. Te Reo Māori, manaakitanga, ūkaipōtanga, kotahitanga, whānaungatanga, pūkengatanga etc). The wānanga engagement model described in this proposal is part of a journey of empowerment for kaitiaki and hapū that is coupled with the expression of kaitiakitanga and re-instatement of the mana of the Tauranga Moana. As such, by providing resources, knowledge and skills that enhance the expression of kaitiakitanga, ***this project indirectly contributes towards the expression of hauora*** that is empowering the expression of kaupapa tuku iho by local hapū as a contribution towards the oranga of te whānau o Rangi raua ko Papatūānuku.

(iv) Mātauranga – the objective of this theme is to *"To develop a distinctive body of knowledge at the interface between indigenous knowledge and RS&T that can be applied to aspects of RS&T. This theme will explore ways to accelerate the creation of knowledge and the development of people, learning, systems and networks".*

The participating hapū of the Tauranga moana recognise that the present-day expression of kaitiakitanga must be re-positioned upon a new body of knowledge that sits at the interface between WS and Mātauranga Māori. This proposal contributes directly towards ***expanding the pre-1840 boundaries of kaitiakitanga to embrace WS knowledge, frameworks, data, models and tools etc.*** The magnitude of the challenge associated with the transfer of WS benefits across linguistic / cultural / worldview boundaries must not be under-estimated. The wānanga engagement model and process for culturally mediating the transfer of WS benefits outlined in this research proposal is a contribution from the hapū of the Tauranga Moana to the emerging frontier of both WS and Mātauranga Māori.

L. CONSENTS AND APPROVAL

Given that this project primarily focuses on the transfer and communication of literary sources of information, data, knowledge, frameworks, models etc, marine consents will not be required to undertake and/or complete this project.

As part of preparing for the engagement process described in this proposal, 3-4 months were devoted to a detailed investigation and reading of ethics relating to kaupapa Māori research (specifically) and indigenous research methodology (more generally). Learnings from this review of current published literature were combined with Pou Matua provided by local hapū to create hapū specific ethical frameworks based around kaupapa and tikanga. The research team at MTA work closely with local kaitiaki to ensure that our activities and processes give appropriate expression to these ethical guidelines. We have every confidence that this project can be completed within the 2-year time frame in a way that give expression to the ethical frameworks outlined above and provide opportunities for their further development.

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Appendix 1 *Clarity on the process of collecting digital recordings and IP management.*

A1.1 Arrangements for the management of digital IP in this programme

The Tāhuhu Matatau Te Ao Tangaroa programme involves the use of digital video, audio and photographic recording activities. In this Appendix section we offer clarification on what will be recorded, how recorded materials will be stored and what arrangements exist for the management of Intellectual Property.

In the ***Oranga Tangata, Oranga Taiao (OTOT) research programme*** we have developed an engagement method with hapū that is based on the digital capture of Wānanga activities. **What is recorded?** Digital video, audio, photographs, documents and spatial data (i.e. maps, GIS) created during wānanga are used to capture the knowledge and knowledge development activities of hapū members *for their benefit*. **How recorded materials will be stored**? This material is currently stored in a secure server at the MTA Trust office in Tauranga. Two further backup copies are stored off-site at the office of iPansophy Limited. None of this material is available online. This storage arrangement is a temporary arrangement that has made it possible for us to start the OTOT research programme. When hapū are ready, they will take over full responsibility for the storage of all digital data. At that time, no digital materials belonging to respective participating hapū will be stored at MTA Trust Office or off-site at the office of iPansophy Limited. This hand over of data storage responsibility is a project goal that we are working towards and includes building the skills and knowledge of hapū members (i.e. kaitiaki) to take this responsibility. **What arrangements exist for the management of Intellectual Property?** All of the IP associated this digital content belongs to each respective, participating hapu. Our involvement in creating this content and training hapū members to create and edit this content, is an expression of *generosity* (cf. manaakitanga) made by the staff of MTA to hapū. We make no claim to this IP or the use this digital content for research, publishing, commercial or private activities. Anything that we do with this digital content reflects the collective wishes of respective, participating hapū.

The initiation of the Sustainable Seas, *Tāhuhu Matatau Te Ao Tangaroa* programme will introduce a new type of digital recording into our engagement with our respective, participating hapū and kaitiaki that is different to the OTOT programme digital content. **What will be recorded?** Figure 1, step 4 describes the digital recording of presentations and demonstrations given to respective, participating hapū *by the staff members of MTA and invited guest presenters.* **How recorded materials will be stored**? This material will be stored on a secure server at the MTA Trust office in Tauranga. Two further backup copies will be stored off-site at the office of iPansophy Limited. Some of this recorded material may eventually be used to create learning resources for the *Tāhuhu Matatau Te Ao Tangaroa* CMS/LMS (Figure 1, step 6). However, the primary purpose of this digital content is to help us as knowledge communicators to hapū members and kaitiaki to *evaluate the effectiveness of our attempts to communicate.*
In addition, we will use written and audio recorded feedback from hapū and kaitiaki, on these presentations and demonstrations, to refine and improve our communication methods. These learnings will be used to build a final collection of digital materials that are 'fit-for-the-purpose' of a future CMS/LMS. **What arrangements exist for the management of Intellectual Property?** All of the IP associated this digital content will belong to each respective, contributing party.

(i) IP associated with digital recordings of presentations and demonstrations given to respective, participating hapū *by the staff members of MTA* will belong to MTA Trust.

(ii) IP associated with digital audio recordings of feedback from hapū members on presentations and demonstrations given will belong to each respective, participating hapū. As part of research programme initiation, we will seek permission from hapū to obtain and use the audio recordings of their feedback to our presentations and demonstrations, as an aid to the refinement of our learning materials. Once this programme goal has been achieved, these audio recordings will be returned to the custody of hapū.

(iii) IP associated with digital recordings of presentations and demonstrations given to respective, participating hapū *by invited guest speakers* will belong to respective invited guest speakers.

Respective, participating hapū have indicated their willingness to be involved in this research programme. Discussion and collective agreement with hapū on IP arrangements for the *Tāhuhu Matatau Te Ao Tangaroa* programme will be negotiated at the first programme wānanga in accordance with the Pou Matua (i.e. guiding kaupapa and tikanga of respective hapū). Given that we already have a concrete (kaupapa-based) working agreement with hapū that fully protects and respects their IP, we anticipate no difficulty in reaching agreement with hapū on the IP arrangements described above for this *Tāhuhu Matatau Te Ao Tangaroa* programme. The same applies to any invited guest speakers. We will not record invited guest speaker presentations unless (i) they have given permission for this and (ii) signed a written release form giving permission for the use of this material in this research programme. Given the strong desire of Western Scientists to want to share their research learnings, we anticipate no problems with this arrangement.

The final collection of digital learning materials (videos, written text, illustrations, photographs, maps and audio) used to build a CMS/LMS for this project will be created by staff at MTA Trust. This will ensure that hapū IP is fully protected.

Appendix 2 *Clarity on the process for future national deployment, and how the development of the online tool could be easily modified to different iwi and hapū contexts.*

A2.1 Context to CMS/LMS development

A central aim of this 2-year project is to create a *prototype* content/learning management system for kaitiaki. iPansophy Limited has been involved in the development, embedding and evaluation of Whare Wānanga-based digital course content and learning aids for Māori second chance learners (2005-2011) as well as the teaching of Māori language in Early Childhood (2012-2015) and English Medium primary school contexts (2016-2017). Staff at MTA Trust also have considerable experience in working with tamariki from Kura Kaupapa Māori in practically-oriented marine ecosystem classrooms. In this project we will draw on this collective knowledge and experience to create learning resources for frontline kaitiaki.

A2.2 Process for future national deployment

We envisage that this project will develop through 3 distinct stages.

Stage 1 – we research, build and evaluate the use of content and learning resources with frontline kaitiaki and hapū of the Tauranga Moana.

Stage 2 – we will seek to evaluate and further develop our prototype CMS/LMS with hapū and frontline kaitiaki beyond the Tauranga Moana. During stage 2 we will also seek to create an alliance with BOP Regional Council, MPI, TKP and Te Ohu Kaimoana with a view to finding a 'champion' government organisation that has the networks and resources to fund and facilitate a National Deployment of our final CMS/LMS. In our former MTM research programme, it was Te Ohu Kaimoana who took on the role of 'champion' for the MTM 'IkaNet[3]' online customary fisheries platform. Staff at Te Ohu Kaimoana have not only facilitated the deployment of IkaNet, but taken responsibility for facilitating the ongoing research development of this tool.
This point is important because, the online CMS/LMS platform that we create will ideally need ongoing content development after this project in order to keep it relevant. In this case, we ideally need a consortium of Government agencies to provide ongoing maintenance funding and to support future research applications. Another future option is that public domain learning resources will become available from research organisations or Govt. ministries that can be directly added to this site (e.g. youtube video content). Not all content will necessarily require a mediated transfer process.

Stage 3 – we will have over the management of the completed CMS/LMS to a National level champion like Te Ohu Kaimoana and position ourselves to participate in the ongoing development of this important platform.
In connection with the planned process for National Deployment, it is worth noting at this stage that:

> *We also fully expect that this research journey will contribute to better understanding of: (I) problems that prevent the successful transfer of knowledge across cultural and worldview boundaries, (ii) gaps that exist in WS research/knowledge and (iii) opportunities that exist to build and develop tools that will more effectively mediate the movement of knowledge across linguistic/cultural/worldview boundaries (page 8, paragraph 4).*

The problem being addressed in this research programme in the disciplinary domain of *marine ecology,* is a problem that exists in every branch of Western science that could potentially offer knowledge benefits to Māori generally, and frontline kaitiaki in particular. Another possible

[3] http://ikanet.co.nz

outcome of this research programme is that we will be successful in creating a generalisable CMS/LMS framework that can be used in other areas of Western science. In particular, we believe that the framework outlined in Figure 3, page 5 of this proposal is an important development in making possible the mediation and transfer of knowledge across worldview/linguistic (cf. cultural) boundaries.

A2.3 Website customisation

In Te Ao Māori the expression of rangatiratanga can exist across all levels of whānau, hapū and iwi. For this reason, it is difficult to formulate a 'teaching programme' that would be general enough to be of 'tikanga' relevance to all frontline kaitiaki representing all iwi, whānau or hapū. Our thought was to create content and learning resources that kaitiaki can then use to customise and optimise their own learning pathway. They will do this by creating their own user account and then by choosing the content or learning resources that they want to concentrate on.

It is also possible to setup an account in such a way that whānau, hapū or a tikanga Māori organisation can create their own network of users (e.g. a hapū training course). In this situation, we can make it possible to customise account themes so that all users in a given account share common naming conventions, logos etc. It is worth noting that the web-developer on our team has a solid track record in building and customising CMS/LMS from original blue-print designs.

While customisation of the kind described above is relatively easy to achieve, it is *more difficult* to customise dialectal differences in Māori language. For example, hapū and iwi of the west coast in the South Island of New Zealand use quite distinctive spelling and pronunciation conventions. Customisation of this kind is technically possible – but would really need additional resourcing. For example, it would be ideal to employ a Māori scholar with competency in target dialects that we desire to include. It would then we necessary to translate more generalised Māori language use in CMS/LMS content and create a separate set of resources. For the meantime, this is an acknowledged limitation of our approach, albeit one that can be overcome with time and adequate resourcing – if desired and necessary.