

Exploring Governance Strategies to Restore New Zealand's Biological Heritage



WPI

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New Zealand's Biological Heritage

National Science Challenge

Exploring Governance Strategies to Restore New Zealand's Biological Heritage

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Abstract

New Zealand's biological heritage and security of native ecosystems are threatened by the introduction of invasive organisms, climate change, and anthropogenic activity. This project evaluated governance models to identify strategies that best restore Aotearoa's biological heritage. This analysis included establishing an understanding of tikanga, documenting community perspectives, and comparing strategies and indicators of desirable bioheritage governance outcomes. The project found that locally driven, strongly legislated, and two-eyed approaches to management are more effective at achieving shared goals in restoring biological heritage.

Executive Summary

Background

The islands encompassing the sovereignty of New Zealand possess a unique and fragile biological heritage and ecosystem - isolated from the majority of the world along the [Pacific's Ring of Fire](#). Through the islands' Polynesian and subsequent European settlement, the introduction of invasive species, coupled with the effects of climate change pose a risk to Aotearoa's biosecurity, native species (such as the kea in Figure 1), ecosystems, and the environment as a whole. New Zealand's natural integrity and life essence (or mauri) are of critical importance for long-term sustainability. To mitigate and better publicize this threat, the country has developed a National Science Challenge focused on protecting and restoring New Zealand's biological heritage.

Figure 1

New Zealand's Native Kea Parrot and Milford Sound



Note. Modified from "[Kea](#)" by [Andrei Chudy](#) is licensed under [CC BY-NC-SA 2.0](#); and "[Milford Sound New Zealand.](#)" by [Bernard Spragg](#) is marked with [CC0 1.0](#)

The goal of this project was to evaluate Māori, Crown, and local governance models to investigate strategies that best restore Aotearoa's biological heritage in support of the National Science Challenges. We established the following objectives:

Objective 1: Establish a background understanding of tikanga (Māori law), as it specifically pertains to the environment and the directives of New Zealand's Biological Heritage National Science Challenge.

Objective 2: Document cultural and community perspectives in Aotearoa among Māori and non-Māori (Pākehā), with regard to community management of natural resources.

Objective 3: Compare strategies and outcomes in governance arrangements to understand and assess the environmental and community impacts each model carries on New Zealand's biological heritage.

Results and Discussion:

To meet these objectives, we conducted a culturally-based literature review, expert interviews, gathered survey data, and synthesized from three New Zealand-based case studies of natural resource management. The results of our literature review, interviews, survey, and case study synthesis are presented below by objective:

1. Establish a Background Understanding of Tikanga

In order to obtain a sufficient understanding of the cultural background and community dynamics at hand in New Zealand, we focused on exploring the Māori principles of tikanga or traditional Māori law and how it can inform upon contemporary environmental management. Our research of tikanga found that Māori law and customs are generally drawn upon as a commodity or repository to ‘fill in the gaps’ of western science and pre-existing power structures and systems. Tikanga and mātauranga Māori might not have the sphere of influence and outreach as it once had centuries ago; however, traditional practices have not vanished from implementation within and relating to Māori circles and customary relationships with te taiao, such as in the marae or customary meeting house seen in Figure 2.

Contemporarily, tikanga and mātauranga are often politicized and assimilated within a western worldview through an extractive process which has been detrimental to not only Māori’s sense of place but also in failing to bridge the gap or disconnect between the mindsets of western power structures and Indigenous knowledge in order to achieve effective results, such as in the Treaty of Waitangi’s application and measured interpretation..

Our data reinforced [Marshall’s theory of ‘two-eyed seeing’](#) and the method’s assertion of the importance of sharing goals, experiences, and knowledge rather than ascribing responsibility, blame, and judgement onto others by means of narrow worldview assessments, which perpetuates the failing power dynamics at hand.

Figure 2
Māori Traditional Marae



Note. From: ["Auckland. Maori marae or meeting house still in use south of the city centre."](#) by [denisbin](#) is licensed under [CC BY-ND 2.0](#)

2. Document Cultural and Community Perspectives

Our research in exploring and satisfying our second objective largely relied upon our interviews of experts around New Zealand and upon our drawing upon results from New Zealand Election Study data and our own survey data. With regard to our interviews, the community management in question mostly related to the expert’s experience in their respective fields which ranged from Treaty of Waitangi settlement entities and processes to private consulting to other National Science Challenge endeavors. We discovered an overall theme amongst both Māori and non-Māori experts that Māori iwi should have more

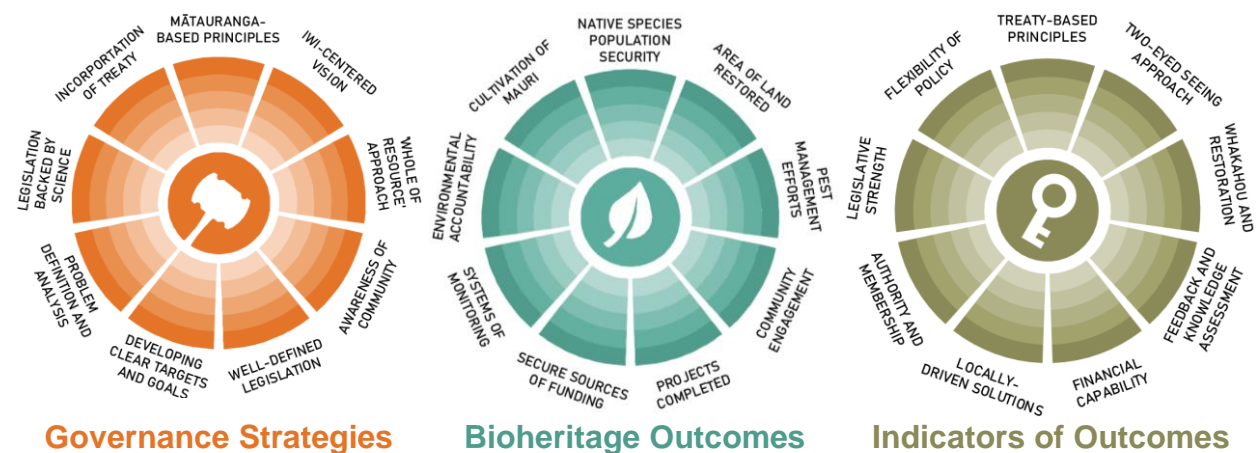
control over environmental management, and mātauranga Māori should be further paired with governance structures. Our results found consistent patterns of Māori desiring not to be viewed as a resource to apply to resource management, but instead wanting to have a more direct role and control over these decisions. Another recurring view was that the Crown and government officials generally lack fundamental knowledge of the Treaty of Waitangi, as well as Māori beliefs and values.

3. Compare Strategies and Outcomes of Governance Arrangements

Through both our review of case studies in New Zealand and expert interviews, our results pointed to the importance of a localized system of environmental management, at the iwi level as a strategy for achieving outcomes which restore biological heritage. The point was made repeatedly across interviews that tikanga and mātauranga generally can not function well on a national level, and instead that values and traditions often vary from iwi to iwi. Māori connect with a strong sense of place which reinforces their knowledge of their locality and tūrangawaewae (place of standing), and enables a better foundation to make decisions surrounding management of the local environment.

This idea of merging and balancing western science and ideologies equally alongside tikanga Māori also impacted our case study analysis, along with other strategies, outcomes, and bioheritage indicators that we identified from our case study synthesis as seen in Figure 3. In our [case studies](#), both of these worldviews were considered and built into decision-making strategies, identification of process indicators, and measures of successful bioheritage outcomes of the governance models.

Figure 3
Effective Strategies of Governance, Positive Biological Heritage Outcomes, and Indicators of Positive Bioheritage Outcomes



Measurable environmental health values are also used as indicators, such as water quality, species population statistics, and biodiversity. These statistical indicators also include quantitative outcomes for governance frameworks, as well as funding capabilities, projects being completed, and measurable factors of community engagement. Additional non-environmentally based indicators, namely representation in decision-making, can also measure Māori involvement and success of co-governance

models. When merged within a locally driven approach to environmental legislation, these key strategies, indicators, and outcomes provided an optimal framework for working towards restoring the bioheritage of Aotearoa, as evidenced in our case study synthesis. Flexibility, legislative strength, transparency, accountability, Treaty-based, and revitalization-driven principles of governance were identified, through our body of evidence, as successful approaches to environmental management, which support restoring biological heritage and preserving native species.

Discussion

Our project results emphasized the importance of two-eyed seeing across all aspects of contemporary social and governance systems. In order to bridge the gap between different worldviews, being able to ‘walk around in someone’s shoes’ and make an effort to understand their point of view is of critical importance as a baseline for future success in joint interactions. Our results stressed the significance of working with both western and Indigenous pillars of knowledge and channeling their sovereign and unique strengths into a holistic, communal product.

Another theme focused on governmental and local authority and its interplay with membership and bioheritage outcomes. The lack of authority associated with Māori and Indigenous membership within decision-making bodies, in some instances, not only dampens their voice and impact on decision-making in all levels of governance, but also perpetuates a lack of trust in existing power structures from Māori and other groups.

Locally tailored approaches to environmental management that have some level of access to funding through either post-settlement governance entities or Crown sources proved to be successful in producing effective bioheritage results in our case study synthesis. Additionally, the elements of flexibility and legislative grounding occur very frequently.

Our body of work found that there are deep-rooted problems in how power is shared and voiced in environmental management in New Zealand. Bridging that gap involves a complex approach to community awareness, perspective, and the understanding of shared goals. Power sharing and community empowerment is critical to equalizing decision-making to holistically discuss and better protect bioheritage.

Project Outcomes

Below are our recommendations for the better restoration of New Zealand’s biological heritage as it relates to adaptive governance and policy, visualized in Figure 4. These successful implementations of these recommendations can be measured through outcome monitoring systems and knowledge assessments to measure progress and success in strategic planning and decision-making. The nature of our recommendations are in accordance with the [United Nation Sustainable Development Goals](#), as well as the sum of the [National Sustainable Development Strategies](#) (NSDS).

1. Encourage two-eyed seeing in governance to bridge the gap between Indigenous and western knowledge through shared goals and spaces.
2. Create a systematic awareness of existing power structures and dynamics to promote innovation in methods of power sharing between people.

3. Foster systems of governance and council membership that factor in equal voice and authority for Māori and Pākehā in decision-making processes.
4. Promote locally driven solutions to resource management to empower smaller-scale, community-based perspectives to places of standing.
5. Emphasize co-management principles to be grounded in legislation to supply proper authority and policy enforcement of shared values.

Figure 4
Governance Recommendations to Improve BioHeritage



Conclusion

The governance of natural resources in New Zealand and across the globe provide an opportunity to develop a sustainable solution to achieve positive biodiversity and environmental outcomes. In Indigenous climates, there is a unique space for the sharing of power, guardianship, action, and worldviews in order to meet these ecological goals and, in the process, provides a chance to foster and strengthen community relationships.

Our project highlights the growing urgency for sustainability initiatives on a local, national, and global scale, in line with [United Nation Sustainable Development Goals 14 - Life Below Water](#) and [15 - Life on Land](#) and their emphasis on the opportunity to incorporate climate initiatives, conservation, and halting the loss of biodiversity and bioheritage (UN, 2021). Strong, inclusive, and equal bodies of governance and authority, in line with [Goal 16 - Peace, Justice, and Strong Institutions](#) will encourage effective and accountable institutions of power. Restoration of the biological heritage of New Zealand brings an opportunity to cultivate Indigenous relationships, promote shared leadership, and foster strong governance to rejuvenate the mana and mauri of the taonga of the Land of the Long White Cloud: Aotearoa.

Figure 5
United Nations Sustainable Development Goals 14, 15, and 16



Note. From the SDGS, United Nations, 2021.

Acknowledgements

Sincere thanks to our project sponsor Dr. Maria Bargh of the Victoria University of Wellington (VUW) as well as project advisors Prof. Ingrid Shockey and Prof. Fred J. Looft of Worcester Polytechnic Institute (WPI). We would like to thank our interviewees Dr. Carwyn Jones of VUW, Mr. Thomas (Tame) Malcolm of the New Zealand's Biological Heritage National Science Challenge Strategic Leadership Group and Puna Consultants, Dr. Nicolas Lewis of the University of Auckland, and Dr. Vincent (Billy) van Uitregt of VUW. Additional thanks to Ms. Ellie Tapsell of VUW, Ms. Karen Coghlan of WPI, and other experts and scholars who helped sponsor, guide, inform, and assist in the design, execution, and delivery of our project.

Authorship

Due to the remote nature of our project the authorship of our project and its respective chapters and sections are largely collaborative and shared equally among our group members. Each member had a direct hand in every section discussed, written, edited, and published in this report.

Joseph Coutcher



Hello! My name Joe Coutcher and I am from a small town called West Greenwich, Rhode Island. I am a junior student athlete at WPI on the American football team and pursuing a civil engineering degree. The IQP experience has been different this year due to COVID-19, but I have learned so much about New Zealand and the Māori culture through our interviews with amazing people.

Major: Civil Engineering

Colin Reynolds



My name is Colin Reynolds and I am from Plymouth, Massachusetts. I have always enjoyed working on hands-on mechanical projects, leading me to pursue a mechanical engineering degree at Worcester Polytechnic Institute. This project has been a great experience, and while we unfortunately were unable to travel to Wellington, I still feel as though we have been lucky to learn so much about Māori culture and New Zealand as a whole. I really look forward to exploring New Zealand someday.

Major: Mechanical Engineering

Timothy Snow



My name is Tim Snow and I am from the small town of Mendon, Massachusetts just southeast of Worcester. I come from an Italian-American background and grew an affinity for design and engineering at a young age, driving me to enroll at Worcester Polytechnic Institute. I am honored to have been able to partake in this exploration of culture, bioheritage, and governance structures. I too look forward to exploring New Zealand someday. *I couldn't be where I am without my mom and my grandparents (Sweetie, Pop, Alma, and Reno, thank you).*

Major: Mechanical Engineering

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Chapter 1: Introduction

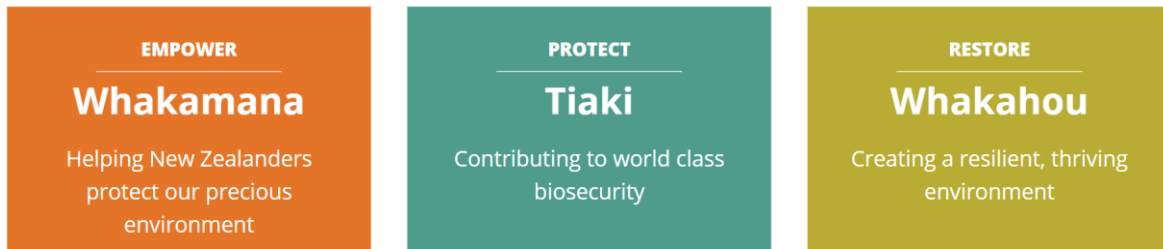
The islands encompassing the sovereignty of New Zealand possess a unique and fragile biological heritage and ecosystem - isolated from the majority of the world along the [Pacific's Ring of Fire](#). Through the islands' Polynesian and subsequent European settlement, the introduction of invasive species, coupled with the effects of climate change pose a risk to Aotearoa's biosecurity, native species, ecosystems, and the environment as a whole. New Zealand's natural integrity and life essence (or mauri) are of critical importance for long-term sustainability. To mitigate and better publicize this threat, the country has developed a National Science Challenge focused on protecting and restoring New Zealand's biological heritage.

The goals of the [National Science Challenges](#) are to address New Zealand's most prominent and pressing scientific issues. Started in 2014, the National Science Challenges (NSCs) organize initiatives that receive funding from the central government (the Crown) to address complex issues facing Aotearoa (*National Science Challenges*, 2020). As one of the 11 NSCs, "[New Zealand's Biological Heritage](#)" was launched in August of 2014. This challenge aims to "protect and manage New Zealand's biodiversity, improve our biosecurity, and enhance our resilience to harmful organisms," and is spearheaded by [Manaaki Whenua - Landcare Research](#) with funding of 63.7M NZD over 10 years from the central government (*Highlights from the National Science Challenges*, 2018). The Victoria University of Wellington is also contributing to this initiative and research effort (*Highlights from the National Science Challenges*, 2018).

The Biological Heritage Challenge has three main objectives: whakamana (empower), tiaki (protect), and whakahou (restore), as illustrated in Figure 1. The former two objectives respectively focus on helping New Zealanders understand and defend their biological heritage, but also aid in building a strong, nationwide biosecurity system (*Our Goals*, 2020). This project targeted whakahou, specifically the aspect of *Adaptive Governance and Policy*, which "tackles the ways in which governance and policy need to change to better protect te taiao (the environment)" (*Adaptive Governance and Policy*, 2020). For the scope and purposes of our project, we defined governance models as a system with structure and accountability for the management of a community, region, or resource.

Figure 1


Goals of New Zealand's Biological Heritage



Note. From *Goals for Our Strategic Outcomes*, 2020, (<https://bioheritage.nz/>).

The difficulty in implementing the goals of the Biological Heritage Challenge is that existing legislative and co-governance models do not adequately acknowledge the decline in Aotearoa's biological heritage. In particular, there are concerns from both Māori and non-Māori (or Pākehā) perspectives that current governance models and Treaty settlements do not sufficiently exhibit true co-governance and effectively restore Aotearoa's biological heritage. The [Treaty of Waitangi](#), drawn up between the British and Māori, specifically outlines co-governance strategies between the Crown and Māori in Aotearoa. Partners in the Biological Heritage Challenge, however, would like to determine the most effective co-governance models that will support the Aotearoa's environment and will ensure the depth and mauri of New Zealand's biological heritage (*National Science Challenges, 2020 : Adaptive Governance and Policy, 2020*).

The goal of this project was to evaluate Māori, Crown, and local governance models to investigate strategies that best restore Aotearoa's biological heritage in support of the National Science Challenges. To meet this goal, we identified several objectives. First, we established a background understanding of tikanga, as it specifically pertains to the environment and the directives of New Zealand's Biological Heritage National Science Challenge. Secondly, we documented cultural and community perspectives in Aotearoa among Māori and non-Māori (Pākehā), with regard to community management of natural resources. This balance of cultural positions can reflect and inform on Māori-Pākehā relationships in co-governance treaties and models, as well as in society as a whole. Finally, we compared strategies and outcomes in governance arrangements to



understand and assess the environmental and community impacts each model carries on New Zealand's biological heritage. This evaluation and case study assessment established strategic choices for effective co-governance systems that can best support environmental resilience and planning.

Chapter 2: Literature Review

The following review explores the background and context of New Zealand's Biological Heritage National Science Challenge, relevant adaptive governance and policy models, and the Māori-Pākehā dynamic at the core of social and political perspectives in Aotearoa. We considered key concepts and factors within comparative case studies relating to environmentally situated co-governance and policy analysis. Ultimately, our review centers around understanding how biological heritage and the abundance and health of natural resources can be affected by differences in cultural, social, and political mindsets and decision-making dynamics.

2.1: The Background of Restoring Biological Heritage

Before the 13th century, the islands known today as New Zealand were a haven to a diverse and isolated population of native organisms, uninhabited by humans. In the 13th and 14th centuries, New Zealand was settled by Polynesian peoples, the ancestors of the Māori residents today who embraced and highly valued the island, its environment, and its treasures. Europeans and the British Crown followed in the mid-19th century and with settlement came the introduction of unique predators, and other invasive species (*A Brief History of New Zealand*, 2020). More recently, global impacts from anthropogenic climate change threaten the fragile ecosystem and native species of New Zealand (Norton, 2016). Since human settlement, it has been determined that “21% of birds are now extinct; 63% and 18% of freshwater fish and vascular plants, respectively, are either threatened with extinction or declining; about two-thirds of the original native forests has been lost [and] wetlands have been reduced by 90%,” as visualized in Figure 2 (Norton, 2016). Because of the adverse effects of anthropogenic settlement, New Zealand's native flora and fauna is at risk and of utmost importance to protect and restore.

Figure 2

Adverse impacts of Settlement on New Zealand's Biological Heritage



Note. Adapted from Norton et al. (2016), (<https://doi.org/10.1111/emr.12230>). Some icons adapted from Freepik and flaticon.com.

In response to the threats to Aotearoa's biological heritage, New Zealand's central government has instituted the National Science Challenges (NSCs), which include eleven initiatives organized around five key operating principles: mission-led, scientifically-backed, collaborative, partner and public based, and integrated with mātauranga Māori or Māori knowledge (*Highlights from the National Science Challenges*, 2018). Each challenge carries a goal of addressing and solving an aspect of the most critical scientific questions in Aotearoa. Themes range from addressing childhood diabetes to managing natural disasters (*Highlights from the National Science Challenges*, 2018). Ultimately, the NSCs focus on the Crown's [Vision Mātauranga](#) policy and [mahi tahi](#) (literally to work together), which each support applying Māori knowledge to innovate economic and societal growth and collaboration between Pākehā (*Highlights from the National Science Challenges*, 2018).

The proposals for the challenges were brought to a panel whose members were chosen by Peter Gluckman, the Prime Minister's Chief Science Advisor at the time, to decipher which challenges out of the original 55 ideas would be implemented as NSCs (Rowarth et al., 2013). The panel needed to ensure the challenges did not just favor one group of people, but rather the panel's goal was to make the challenges favorable to all

New Zealanders. To achieve this, the panel consulted a Māori representative to offer the Māori viewpoint on the challenges.

The final eleven challenges address issues related to technology, science, and especially the environment. Together, their objective is “to protect and manage New Zealand’s biodiversity, improve our biosecurity, and enhance our resilience to harmful organisms.” (*National Science Challenges*, 2020). The program is backed with a total of over \$680M (NZ\$) from the central government over 10 years for all 11 Challenges launched between 2014 and 2016 (*National Science Challenges*, 2020).

A [June 2020 report](#) by a panel serving the Minister for the Environment, supported the Biological Heritage initiative with recommendations for new directions and overarching change in New Zealand’s resource management system (*New directions for resource management in New Zealand*, 2020). Their findings noted increased pressure on Aotearoa’s natural environment, the struggle to keep pace with the impact of population growth in urban areas, and the growing threat of climate change and carbon emissions. The Minister for the Environment’s panel’s recommendations revolve around the importance of promoting “a much more effective role for Māori throughout the resource management system” (*New directions for resource management in New Zealand*, 2020, p. 6). This supported our initial assertion that effective and enriching co-governance arrangements and Treaty models between Māori and Pākehā are of utmost importance to the goal of a wholly diverse and incorporated Aotearoa.

To meet this goal, the Biological Heritage Challenge is broken up into three impact frameworks, each with a few strategic outcomes and seven outcomes in total. These seven outcomes focus on topics ranging from developing Eco-indexes to report on declines in biological heritage to exploring state-of-the-art surveillance systems to measure and enhance biosecurity measures (*Our Goals*, 2020). Of the impact frameworks [whakamana](#) (empower), [tiaki](#) (protect), and [whakahou](#), our project focuses on the impact framework of whakahou or ‘restore.’ There are two strategic outcomes in the whakahou framework, one being to quantify social-ecological linkages in pathways to ecosystem regeneration and the other being studying adaptive governance and policy in managing, protecting, and restoring lands in Aotearoa (*Our Goals*, 2020).

2.2: The Partners in New Zealand’s Biological Heritage

Pākehā or non-Māori people of New Zealand are typically of European (specifically British) descent. As part of many settlement waves, many New Zealand residents with different heritages have lived in New Zealand for generations. With that in mind, there can be disparities about inherent connections to nature, which have led to conflict and questions about representation in policymaking and environmental management. Pākehā currently dominate Parliament, controlling the vast majority of seats (MPs and Electorates—New Zealand Parliament, 2020). As of early 2021, only 25 out of 120 members of Parliament identify as being of Māori descent (CNN, 2020). Although this number is slightly greater than the percent of New Zealand’s population that is Māori (about 17%), those of original Māori descendants are clearly in a minority, and as a result the Pākehā in a Parliamentary majority have the associated power to make legislation and control the governance of New Zealand resources (CNN, 2020). Figure 3 depicts that while both Māori and Pākehā are important partners in Aotearoa’s biological heritage, the partner at the forefront of New Zealand’s bioheritage is the environment itself.

The future of the rich and unique wildlife and natural resources that exist in Aotearoa largely depends on the strategies and outcomes of governance models that can be carried out, and the complex relationships between Māori and Pākehā. The struggle between prioritizing the role of protector and kaitiakitanga of their environment versus itemizing natural resources has consequences for New Zealand’s biological heritage and native flora and fauna.



2.3: The Treaty of Waitangi and Foundation of New Zealand's Governance

The Biological Heritage initiative is built on a foundation of encouraging inclusive governance models for all partners. This means engaging public and governance-based partners as part of the restoration conversation. These partner perspectives can be seen primarily as the Māori and Pākehā perspectives and includes the natural ecosystem of Aotearoa as a critical partner in the outcome of the challenge, as noted above. The partner relationships are understood more clearly when contextualized within the history of New Zealand's establishment and founding documents, most notably the [Treaty of Waitangi](#).

The Māori-Pākehā governance strategies historically diverge in decisions concerning New Zealand's natural landscape and resources. Māori point of view is often positioned as protectors or kaitiaki (guardians) of Aotearoa, while European influences see the land more as containing individual resources to be used or managed. In historical terms, this relationship is perhaps best illustrated by a 1769 painting by Polynesian explorer [Tupaia](#), depicting the English explorer Joseph Banks (Pākehā in this analogy) trading with a Māori man for a crayfish (the environment), as shown in Figure 4. Tupaia was a navigator and religious leader that first developed strong relations with Joseph Banks' party, [James Cook's](#) first voyage to Aotearoa (*Māori Trading a Crayfish with Joseph Banks* | *British Library*, n.d.).

Figure 4


A Māori Man and English Explorer Bartering



Note. A 1769 painting by Polynesian explorer Tupaia, depicting the English explorer Joseph Banks (Pākehā in this analogy) trading with a Māori man for a crayfish. From *Māori Trading a Crayfish with Joseph Banks* | *British Library*, n.d. (<https://www.bl.uk/collection-items/maori-trading-a-crayfish-with-joseph-banks>).

The Māori are the longest inhabitants of New Zealand, and as the kaitiaki of Aotearoa's land and natural resources, a key concern stems from conflicting understandings of the Treaty of Waitangi, New Zealand's founding document organized in 1840 between the Māori and the British Crown. However, before the Treaty was signed, the British had already begun their plan to gain authority in New Zealand. With a large population of whalers and other English settlers already on the island, the English appointed James Busby as Resident of New Zealand in 1832 (Jones, 2016, p. 6). Busby's main objective was to have the Māori adopt a westernized government. Just a couple years later, northern chiefs created a Declaration of Independence, as well as a plan to meet in a congress on an annual basis. The purpose of the congress was to pass laws for New Zealand and "ask the King of England to protect the independence of the [Māori] chiefs" (Jones, 2016, pp. 6-7). This document set a precedent for agreements between the British colonizers and the Māori natives for years to come.

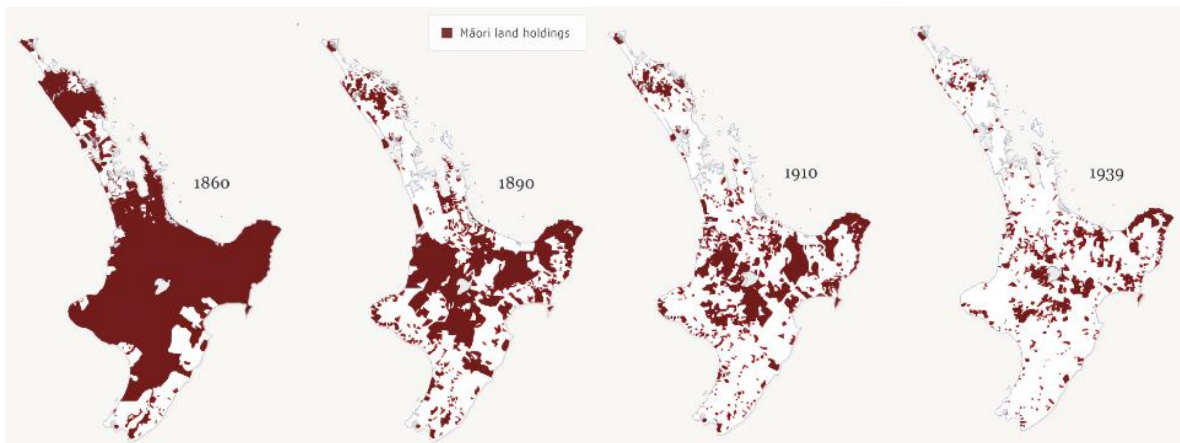
The implementation and interpretation of the Treaty of Waitangi has led to differing ideas and viewpoints on who has rightful authority over how the land is managed. While



the English version results in the Māori forfeiting “sovereignty” of New Zealand’s land to the British, the Māori version speaks of giving Britain “kawanatanga” or governance (*The Treaty in brief*, 2020). Additionally, there was a disconnect when concerning property rights, where “the English version guaranteed ‘undisturbed possession’ of all their ‘properties,’ but the Māori version guaranteed ‘tino rangatiratanga’ (full authority/sovereignty) over ‘taonga’ (treasures, which may be intangible)” (*The Treaty in brief*, 2020). These distinctions between English and Māori versions of the Treaty of Waitangi still are a point of conflict today and are at the core of the fight for Māori rights. The Waitangi Tribunal is a committee made up of Māori, tasked with consulting on New Zealand’s policy and legislation involving the Treaty of Waitangi and making claims. Specifically, the [Wai 262](#) claim or “Flora and Fauna” claim of 1991 supports and sets a precedent for the need for an increased role of the Māori in the NZ government and management of natural resources, and mitigating long-standing disrespect of the original sentiments of the Treaty of Waitangi (*Te Pae Tawhiti: Wai 262*, 2020). The disregard of this original Treaty has over time led to the loss and abuse of Māori lands, limiting their role and power in New Zealand Governance, as seen in Figure 5. After the Treaty was signed, there were years of military battle between Māori and the British Crown for claim over the Māori land, and as a result throughout the 19th century, the Crown confiscated massive amounts of land (Jones, 2016, pp. 11-12). These conflicts, Treaty grievances, and the degradation of Māori land often perpetuates a lack of trust in the Crown and co-governance dynamics in New Zealand.

Figure 5

Māori Holdings in North Island, New Zealand 1860-1939



Note. Enhanced from Orange, 2001, (<https://www.bwb.co.nz/books/an-illustrated-history-of-the-treaty-of-waitangi>).

2.4: Adaptive Governance Models and Strategies

New Zealand's governance system includes a central government that operates at the national level, with 11 regional councils and 67 territorial councils that manage locally (*History & government*, 2020). These councils are typically where the community has the greatest participation in decision-making (*Local Government in NZ*, 2020). Furthermore, the local governments are required by the [Local Government Act](#) (LGA) of 2002 and the [Resource Management Act](#) (RMA) of 1991 to enable inclusive perspectives including consulting with Māori in the region on any planning or legislative process (*Council-Māori Participation Arrangements*, 2017).

Each council has a different method of engaging with communities. For instance, many councils observe Memoranda of Understanding (MoU) with the local Māori in their region that outline the type of relationship they have, as well as the process they use to consult with each other. In the city of Manukau, for example, the local regional council has an agreement with the Tangata Whenua (people of the land or Māori people) tribes to create an annual plan which discusses Māori involvement in decision-making and the council. A more in-depth description of this system can be found in [Appendix A](#), Figure 30.

Despite these engagement structures, the outcomes of governance models do not always address or account for regional concerns. For example, Māori in various communities have complained that the members of their local councils do not understand

the Māori way of life and that their council at times have poor and indirect communication with the community. One Māori representative said that “it’s important that the relationships are formalised with the politicians, not with the staff” meaning the Māori did not have a formal relationship with the policymakers (James, 2002). Ideally, communication should be direct with the people on the council, and with representation from the community.

By comparison, in some districts, significant Māori representation on committees of the local councils has proven to be successful for implementing strategies of governance and management that achieve outcomes that support the needs of the community. These regulatory committees are responsible for acknowledging topics brought to attention. Also, some Māori representatives are appointed to a superior Policy Committee, so the Māori presence throughout the council carries greater weight on policymaking in their respective region. Māori and Pākehā generally both claim that this representation of Māori in higher level positions is fair. This governing system continues to improve as the relationship between the two cultures evolves over time (James, 2002). When the local Pākehā council has the trust of the Māori, both sides work more effectively together.

2.5: How Mātauranga Māori and Mahi Tahī Inform Policy Outcomes

The challenge of co-governance is that the dominant or majority perspectives can drive policymaking and their outcomes. An important conceptual framework in Aotearoa is the idea of [mātauranga Māori](#) - Māori or traditional knowledge. Mātauranga Māori collectively refers to the wealth of knowledge from Polynesian ancestors and Māori experience in Aotearoa (*Mātauranga Māori and science*, 2017). This framework applies holistically to education, the environment, language, hunting and fishing, cultural practices, and much more (*Mātauranga Māori and science*, 2017). To emphasize and practice mātauranga Māori, the Crown has implemented a policy aimed at amplifying Māori knowledge as it applies to science and innovation in Aotearoa known as Vision Mātauranga (*Vision Mātauranga*, 2020).

Alongside this, the idea of mahi tahi - meaning ‘working together’ or ‘collaboration’ - is a principle of partnership employed by the Crown which requires Māori and Pākehā to work together on mutually beneficial issues (V. U. of Wellington, 2020). Mātauranga Māori and mahi tahi by nature include critical perspectives on scientific and cultural issues facing Aotearoa (concept iconized in Figure 6).

Figure 6
Matauranga Māori Icon of Traditional Koru Bud or Fern Bud



An example of this partnership in policy practice can be found in the Paparoa National Park, a park founded in 1987 as part of a forest on the west coast of the South Island (Ruru, 2020). When first founded, the park’s policies had little influence or input from the local iwi (tribe), Ngāi Tahu. In 1998, a conservation act was developed between the Ngai Tahu and the Department of Conservation (DOC) that introduced many new mechanisms that were some of the first that promoted mātauranga Māori in environmental policy (Ruru, 2020). Māori concepts were applied such as designating some areas as tōpuni (cloaked) for special cultural consideration, defining certain species as taonga (treasures), or the protection of mahinga kai or “the customary gathering of food and natural materials, and the places where those resources are gathered” (Ruru, 2020, p. 212). The first applications of mātauranga Māori set precedents for decades of legislative and social upheaval; however, these concepts are now promoted in the eleven NSCs, including New Zealand’s Biological Heritage.

Related to mātauranga Māori is the Māori idea of tikanga. As described by [Dr. Carwyn Jones](#) in his book *New Treaty, New Tradition: Reconciling New Zealand and Māori Law*, tikanga is “the right or correct way of doing things within Māori society...it encompasses Māori law but also includes ritual, custom, and spiritual and socio-political dimensions that go well beyond the legal domain” (Jones, 2016, p. 23). Tikanga is an important concept in Māori culture, and extremely relevant as it applies to governance methods and strategies. A major part of tikanga is Māori law, which encompasses the

concepts of “whanaungatanga, manaakitanga, mana, tapu, and utu” which “speak to the nature of relationships, spirituality, and authority in the Māori world” (Jones, 2016, p. 22). These ideals govern much of the decision-making specifically with regard to the Treaty of Waitangi and subsequent settlements concerning the Crown and Māori.

Tino rangatiratanga refers to the “Māori concept of self-determination and autonomy [...] comparable to the western concept of sovereignty” (Jones, 2016, p. 27). Tino rangatiratanga or sovereignty is at the center of the Treaty of Waitangi, and as described in [Section 2.3](#), it is the main point of contention between the English and Māori versions of the Treaty. The tino rangatiratanga of the Māori is still evolving and changing to this day. As described by Jones, “there is importance of viewing Treaty claims and settlement as merely part of a wider process of reconciliation and constitutional evolution” (Jones, 2016, p. 21). While the evolving processes and legal practices governed by the Treaty of Waitangi are vital for representation of the Māori people and their relationship with the Crown, it is also important to recognize the changes brought to Māori culture. Consequently, “it is difficult to distinguish between changes in Māori legal traditions that are self-determined and those forced upon the Māori legal order” (Jones, 2016, p. 26). Oftentimes, many aspects of tikanga and mātauranga must be altered, adapted, or diluted to be applied to modern society and western power structures during these Treaty settlement processes; and as Jones explains, this process of constitutional evolution over the course of the Treaty’s respective settlements has in many ways explored, redefined, and altered how mātauranga and tikanga Māori are situated within contemporary culture and politics.

There are plenty of resources to learn more about mātauranga Māori and traditional Indigenous knowledge. This [website](#) has an interactive display and educational videos that discuss mātauranga Māori and its origins, application, and more.

2.6: Two-Eyed Seeing, Indigenous Participation, Decolonizing Science

As our research pertains to applying Indigenous knowledge and tradition in order to synthesize a sustainable and efficient approach to the governance of natural resources and bioheritage, we conducted an overview of studies related to the issues of decolonizing science and producing measured, culturally-conscient research. As defined

by [Linda Smith](#) in her book *Decolonizing Methodologies*, decolonization, as it relates to research methodology and literature, “does not mean and has not meant a total rejection of all theory or research or western knowledge. Rather, it is about centering our concerns and worldviews and then coming to know and understand theory and research from our own perspectives and for our own purpose” (Smith, 1999, p. 29). It was important for our group to understand our position as Americans and as westerners researching an unfamiliar land through the lens of a foreign worldview that can obscure or tint our objectivity and discourse.

In addition to familiarizing ourselves with the theories behind decolonizing science and methodologies, we explored additional worldview frameworks as it related to the scope of our project. Among these was Albert Marshall’s framework for ‘two-eyed seeing’ as a means for reconciling western methods with Indigenous knowledge for scholarly purposes (Peltier, 2018). Marshall was an Elder of the [Mi’kmaq people](#) of northeastern Maine and eastern Canada and promoted this concept in the practice and discussion of participatory research. He described this strategy as “to see from one eye with the strengths of Indigenous ways of knowing, and to see from the other eye with the strengths of western ways of knowing, and to use both of these eyes together” (Peltier, 2018, p. 2). This approach to research is mirrored in the themes present in Smith’s *Decolonizing Science*, wherein studies and methodologies aren’t impeded or clouded by the faulty usage of either fully Westernized or fully Indigenous lenses and perspectives.

Two-eyed seeing, as it applies to New Zealand, is a critically important framework for examining and discussing recommendations to governance structures and power dynamics. As explored in our research on mātauranga and tikanga Māori, oftentimes Indigenous principles are merely drawn upon as a commodity in informing upon pre-existing western, hegemonic structures. As Marshall suggests, only when both worldviews’ strengths are viewed as aside and sovereign pillars of wisdom and power, the product of any interaction (such as co-governance) is a holistic and balanced prospect. A basic understanding of methods such as these concepts of reconciliation and balance of worldviews, cultures, and perspectives was important in our measured and comprehensive approach to research in this project.

2.7: Relevant Case Studies


Outside of New Zealand, the increased emphasis of Indigenous knowledge and co-governance arrangements and mechanisms around environmental decision-making is a movement that has gained traction and implementation in existing environments. The following case studies explore recent efforts in native co-governance in applications outside of New Zealand.

Case 1: Inuit Role in Managing Arctic Marine Resources

In the Arctic regions of Canada, Alaska, and Greenland, the [Inuit](#) rely upon and have an intimate relationship with the ecosystem of the Arctic, including its wildlife and other natural resources. These resources play a critical role in all aspects of Inuit life; their entire culture being based upon this way of life. They have naturally managed these natural resources for thousands of years, and still face challenges to these knowledge systems from the Canadian, Danish, and U.S. federal governments (Inukalik, A., et al., 2020).

In an effort to promote co-governance, the [Inuit Circumpolar Council of Alaska](#) (in their [Food sovereignty and self-governance: Inuit role in managing arctic marine resources report](#) on Inuit governance of Arctic resources) explores examples of co-governance strategies developed between the Inuit communities and the US and Canadian federal governments. An overall emphasis between these different alliances is communication being a successful approach and strategy in co-governance. For those outside the lived experience of the Arctic to fully understand the connection and reliance that the Inuit peoples have with their environment and marine resources, they must effectively communicate with the government/organization with which they are working. A mutual understanding of nature must be shared between all those involved, such that common goals and objectives may be agreed upon and reached for sound environmental and bioheritage outcomes (Inukalik, A., et al., 2020).

One particular co-governance system in the Inuvialuit Settlement Region in the far north of Canada between the Inuvialuit peoples and the government of Canada is built upon the Inuvialuit Final Agreement (IFA) of 1984 (Inukalik, A., et al., 2020). Much like the Treaty of Waitangi in New Zealand, this agreement between native and non-native



people provided the basis of the relationship between the two groups, entitling First Nation communities to real participation in government and preservation of culture. This agreement has been well received and respected, delivering on its promise of co-governance and agreed-upon outcomes. In practice, laws impinging on this agreement are overridden and nullified, and the IFA model communities are centered in this co-governance model. All regulations on wildlife and other marine resources are decided by Inuvialuit Hunter Trapper Committees (HTCs) and the Inuvialuit Game Council (IGC), with the oversight and help of the government (Inukalik, A., et al., 2020). This community-based system allows for self-determination and autonomy, based on the social, cultural, and environmental outcomes of their community, as well as the communities around them. Please refer to Figure 31 ([Appendix A](#)) for a visualization of this system.

Overall, this trust between the Canadian government and small communities could be applied in New Zealand, building on trust that communities who have been living in regions for hundreds of years know best how to manage natural resources.

Case 2: “Treatment as a State” Policy for Indigenous Water Co-Governance

Water management is a pertinent topic for communities regardless of location, be it a source for food and clean water or ceremonial purposes. As discussed in [Engaging Colonial Entanglements: “Treatment as a State” Policy for Indigenous Water Co-Governance](#) from the Global Environmental Politics Journal, the U.S. Federal government involvement in Indigenous water governance, namely the U.S. Clean Water Act (CWA) of 1972, has caused tensions and debate over Native American self-governance (Diver, S., et al., 2019). Self-determination is an important policy in government relations with Indigenous peoples, allowing local communities to govern and make their own policies regarding their native land without the infringement of the government. A 1987 amendment to the Clean Water Act established the Treatment as a State (TAS) policy, an important development in co-governance models between native peoples and non-native government entities. This provision allows for Indigenous tribes to be treated essentially as a state, affording them the same rights and law-making power a state has with regards to water quality standards. This allows tribes to set higher water quality and


environmental standards than what exists federally; making decisions that best fit their cultural uses (Diver, S., et al., 2019).

A positive application of this TAS policy occurred in 1992 with high water quality standards being instituted by the Pueblo of Isleta community on the Rio Grande. These standards were stricter than those in place in Albuquerque, New Mexico upstream from them. This then caused Albuquerque to enact stricter water quality standards and forced modifications to the water treatment infrastructure, exemplifying the positive effects Native Policy can have even on resources outside of their jurisdiction. While there are lessons to be learned from the Treatment of State policy, there is still much to be improved. The potential for a tribe to be recognized as a state is limited to tribes that are recognized by the federal government, which is an entirely separate process within itself. Additionally, tribes that have the TAS distinction do not always have the necessary government funding or resources to enact water standards, and they may be under the threat of lawsuits and intimidation by the corporations that their standards would affect (Diver, S., et al., 2019).

The Treatment as a State policy could be applied with Māori in New Zealand, as it would allow for more direct Māori control over their lands and nature, which could ultimately lead to stricter environmental policies. The key in the application of this co-governance model would be ensuring the Māori have authority over these decisions along with any necessary funding, and that they can not be intimidated or unjustly treated by corporations or government bodies. Overall, the intimate relationship of the Māori with nature would only lend credibility to their policy and governance, giving them the background and knowledge to effectively manage and govern Aotearoa's natural resources.

Case 3: Co-Management and Protected Land-Use on Federal Lands

A key relationship between Native American nations and the US federal government concerns land management. Many Native American tribes hold or share lands that are technically owned and managed by the federal government. This is derived from Native Americans having original ownership or ancestral backgrounds on these lands, which have since been overtaken by the federal government. Being recognized by




the U.S. government, existing tribal governments are seen as sovereign and separate entities from the states they are located in, and not just mere stakeholders in disputes regarding land that is rightfully protected based on treaties and federal designations (Nie, 2008).

One particular protected land area presented in an [article](#) from the *Natural Resources Journal* is the Badger-Two Medicine area sacred to the Blackfeet Nation in Montana. These lands are being threatened by oil and gas drilling, along with motorized vehicles and recreation. In the Blackfeet Treaty of 1896, the Blackfeet ceded and sold land to the U.S. government with reserved rights entitling the Blackfeet to still use its resources, and that the land would remain public. The contention in this dispute is again based on the abuse of a previous agreement between native and non-native parties, a common theme throughout these relationships (Nie, 2008).

Both co-governance and protected land-use techniques have been implemented to try to better this relationship between the Blackfeet and the U.S. government in governance over their land. A failure of the co-management techniques employed in this case is that it results in government proposals that are presented to native communities, rather than enabling them to be a part of the decision-making and legislative process. This causes the actual management to be largely out of native control, only having the power to agree or disagree with government edicts (Nie, 2008). In order to have an actual effective voice, Indigenous people must be involved in decision-making from the beginning, rather than being added onto the end as an afterthought, without any influence. This is already seen in New Zealand, with Māori having seats in Parliament, an important step in native representation, but one that can still be improved upon.

Another issue in co-governance models discussed is that native tribes have no legal precedent to enforce many of the laws and statutes in place to protect their land. Since the U.S. federal government still ultimately overrides tribal nations from a legislative standpoint, and due to the nature of how tribes are recognized, native groups do not always have the legal right to punish those breaking the laws with regard to their environment, when the perpetrator is not a member of the native group (Nie, 2008). Legislation must be explicit in stating the rights and boundaries of native jurisdiction,



which will be important to note in New Zealand concerning the reach and authority of Māori over their lands.

2.8: Literature Review Summary

Our review found that a benchmark for governance and adaptive policy of natural resources should emphasize co-governance and communication. Environmental policy decisions for bioheritage are best supported by frameworks that incorporate Indigenous knowledge, community perspectives, and informed governance strategies. Collaborative action can unify to better restore native biological heritage. This collaboration does not necessarily entail the hegemonic western structures being informed by indigenous knowledge, but rather them being viewed side by side as a system of shared power, knowledge, culture, and values. Ultimately, understanding and practicing methods of two-eyed seeing and awareness of power structures that are present in governance structures is necessary to draft effective management strategies in order to produce positive outcomes on biological heritage.

Chapter 3: Methodology

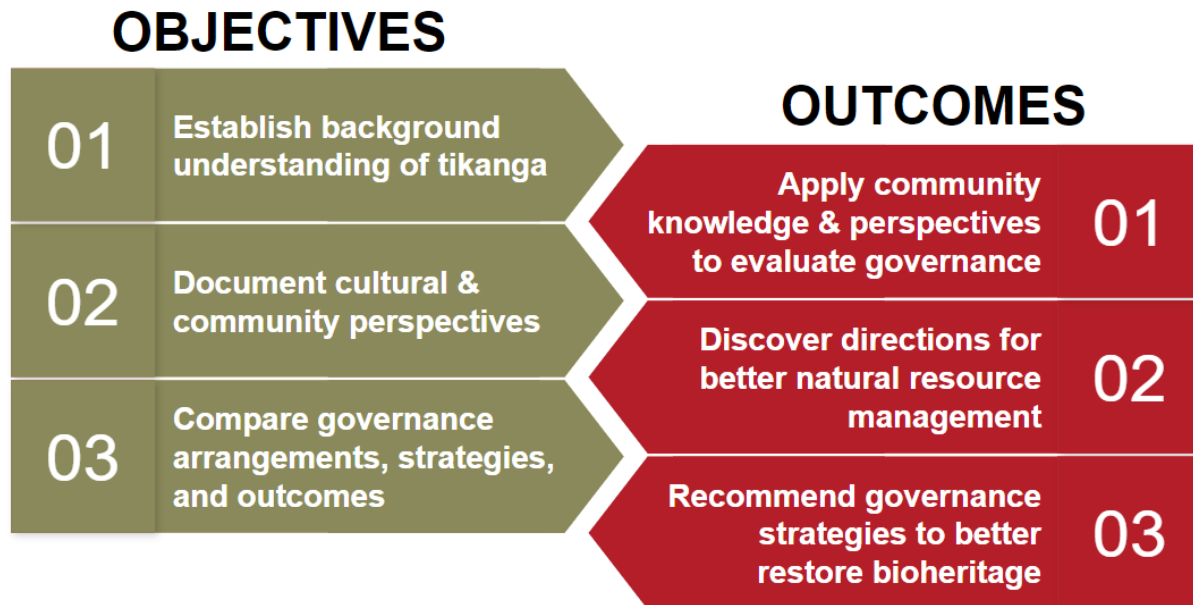
The goal of this project was to evaluate Māori, Crown, and local governance models to investigate strategies that best restore Aotearoa's biological heritage in support of the National Science Challenges. To achieve this goal, we identified three critical objectives:

1. Establish a background understanding of tikanga, as it specifically pertains to the environment and the directives of New Zealand's Biological Heritage National Science Challenge.
2. Document cultural and community perspectives in Aotearoa among Māori and non-Māori (Pākehā), with regard to community management of natural resources.
3. Compare strategies and outcomes in governance arrangements to understand and assess the environmental and community impacts each model carries on New Zealand's biological heritage.

In general, the first two objectives are preliminary in nature and allowed for our project's understanding of Māori culture and communities, and served as a foundation for accomplishing our third and most critical objective of assessing governance models. In order to meet the first two objectives, archival research of relevant resources and a study of historical background was required, particularly as it relates to the objectives of New Zealand's Biological Heritage National Science Challenge. The knowledge gained as a result of this research is summarized in the literature review. Each of the strategies we used to collect data to meet these three objectives is discussed in greater depth below. These objectives and their associated outcomes are visualized in Figure 7 below.

Figure 7

Project Objectives and Outcomes




3.1: Establishing a Background Understanding of Tikanga in Aotearoa

An important aspect of working towards restoring New Zealand’s Biological Heritage was to fully develop a nuanced understanding of what tikanga or Māori law and customs represent in Aotearoa, and why tikanga is so important to the Māori people. This provided the baseline for our work and supplied the background knowledge necessary to accomplish our subsequent project objectives and goals.

The most important learning opportunity in achieving this objective was from the Māori community and wealth of Māori knowledge available to our team, as tikanga and the mauri (or life essence) of New Zealand are deeply rooted in culture and defines a deeply-interwoven relationship with the environment. A methodology strategy of ethnography, research, and interviews allowed us to explore the importance of the life essence of Aotearoa’s environment and the tikanga-based governance of Māori resources and ecosystems through first-hand explanations and perspectives.

Background research and study of Māori culture, customs, and mauri was essential in our understanding and knowledge of tikanga, and its importance in Aotearoa.



This detailed look into the relationship between Māori culture and the environment of New Zealand and their role in its empowerment, protection, and restoration prepared us for the in-depth discussions and complex topics covered in our interviews on co-governance and the effective mechanisms of management of New Zealand's rich biodiversity.

As a team, we consulted culturally-based literature, ethnography studies in New Zealand, and other forms of social research to attain this background. We wanted to ensure that we, as Americans, had a grasp of the baseline before approaching experts to discuss deeply rooted perspectives. We interviewed Māori individuals and experts on the interpretation of this topic. We selected a few questions to be asked at the end of our interviews in the form of concluding thoughts on the interplay of tikanga and mauri and the environment and what it means to them. This directly informed our methods of evaluating co-governance arrangements and the holistic approach to resource management.

Using a snowball sample method initially through the contacts received from Dr. Bargh, we identified a range of individuals to interview. These interviews were conducted on Zoom and recorded with the interviewee's permission via formal consent forms. This allowed for further analysis of the interview at a later time and also allowed for us to be more engaged during the interview while taking brief and succinct notes. As noted in Ward's *Researching the City*, it was important for our team to be open and expressive about our focus, and in what nature the respondents' contributions and answers would be used from the beginning (Ward, 2020). Additionally, the format and style of these interviews were designed to unfold more as a conversation, to allow for a more organic discussion of this complex topic (Ward, 2020). Interview questions and a guide can be found in [Appendix B](#).

3.2: Documenting Cultural and Community Perspectives

Understanding community perspectives and relationships with the environment and its management is critical in recognizing the impact they have on societal and environmental outcomes in the effort to restore New Zealand's biological heritage. To achieve this objective of identifying cultural and community perspectives, we evaluated ethnographic studies, conducted focused research, conducted interviews, and deployed

a survey through the National Science Challenges to collect as many perspectives as possible. Understanding how our perspectives differ between the Māori and Pākehā, especially as American students, was important in preparation for further exploration of and recommendations for governance models in New Zealand to better the restoration of native biological heritage.

To record views and relations between Māori and Pākehā residents, we conducted research as well as content analysis of case studies to identify similarities and differences between community viewpoints. As with our first objective, we concluded our interviews with questions that were designed to assess personal experiences and perceptions of fairness and trust in local governance (see [Appendix B](#)). These interviews were conducted in a semi-structured style to allow for more discussion on interviewee experiences and opinions (Ward, 2020). The interviews were designed to gain insight into the inner workings of various governance models currently being used, and their perception by those directly involved with them. We organized a survey to be sent in the National Science Challenges' [newsletter](#) for New Zealand's Biological Heritage National Science Challenge.

Interview questions, an interview guideline, and survey questions can be found in [Appendix B](#).

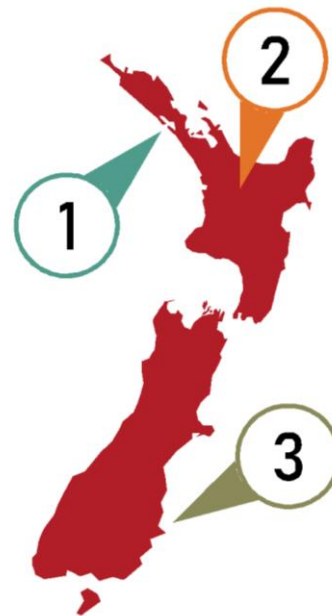
3.3: Comparing Governance Arrangements, Strategies, and Outcomes

We first conducted preliminary research on the nature and overall scope of existing legislation including the [Treaty of Waitangi](#) and the [Resource Management Act of 1991](#). This included exploring examples of precedents in Māori-Pākehā governance and policymaking of Aotearoa's natural resources and taonga (treasures).

To find evidence of strategies and bioheritage outcomes, we evaluated recent community-based decision-making cases that represented approaches from one of three governance models: a). co-governance of natural resources, b). Treaty settlement (Treaty of Waitangi) governance of natural resources, and c). tikanga-based governance (Māori law) of natural resources (M. Bargh, personal communication, October 18, 2020).

These case studies are mapped in Figure 8. Each of the governance models illustrates unique trends and underlying premises in the management of natural resources in New Zealand in conjunction with the themes and directives of New Zealand’s Biological Heritage Challenge. In accordance with this approach, the three strategic approaches are described in greater detail below:

Figure 8
New Zealand Case Study Map



1. Co-governance of natural resources

The local and community management of Kaipara Harbour to address sediment run-off from the surrounding area ([Major Project to Address Kaipara Harbour Sediment](#), 2019; [Makey & Awatere](#), 2018).

2. Treaty-based or Treaty settlement governance of natural resources

Treaty settlements that arrange the local iwi’s (Waikato-Tainui) involvement in the co-management of the Waikato River catchment ([Waikato River and Waipa River Co-Management](#), 2019; [Waikato-Tainui Raupatu Claims \(Waikato River\) Settlement Act 2010](#) No 24 (as at 07 August 2020), *Public Act Contents – New Zealand Legislation*, 2010).

3. Tikanga-based governance of natural resources

Implementation of tikanga in the management of a coastal region in East Otago that designated land as taiāpure, a customary and culturally significant Māori fishery ([East Otago Taiāpure Management Committee](#), 2013).

Strategies for assessing governance models presented in case studies were determined during the process of reviewing the case studies themselves in [Chapter 4: Results and Discussion](#). Positive outcomes for biological heritage were discovered once we became more familiar with the indicators and the elements of the governance models. Generally, case studies were evaluated for common mechanisms or strategies that resulted in positive outcomes in working to restore New Zealand's biological heritage. Additionally, indicators were generated from the case studies to identify important outcomes.

Participants were interviewed over Zoom and were identified from media reports or snowball sampling from contacts identified during our evaluations. To specifically address this objective, open-ended interviews provided important insights into process enabled outcomes for restoring bioheritage (Ward, 2020).

Chapter 4: Results and Discussion

The following results and discussion address our objectives.

We shifted our first two objectives to largely be satisfied via limited interviews and aside data collection from surveys over a timeframe of about 2-3 weeks. This was with the intention of scaling up our research for our third objective to focus more on the case study analysis found in [Section 4.3](#) and onwards.

4.1: Establish a Background Understanding of Tikanga

Our research of tikanga found that Māori law and customs are generally drawn upon as a commodity or repository to ‘fill in the gaps’ of western science, ideologies, pre-existing power structures and systems. Tikanga and mātauranga Māori might not have the sphere of influence and outreach as it once had centuries ago; however, traditional practices have not vanished from implementation within and relating to Māori circles and customary relationships with te taiao. Contemporarily, tikanga and mātauranga are often politicized and assimilated within a western worldview through an extractive process which has been detrimental to not only Māori’s sense of place but also in failing to bridge the gap or disconnect between the mindsets of western power structures and Indigenous knowledge in order to achieve effective results, such as in the Treaty of Waitangi’s application and interpretation. Our data reinforced Marshall’s theory of ‘two-eyed seeing’ and the method’s assertion of the importance of sharing goals, experiences, and knowledge rather than ascribing responsibility, blame, and judgement onto others by means of narrow worldview assessments, which perpetuates the failing power dynamics at hand.

This notion of tikanga as almost a commodity was evidenced in our discussion with Dr. Carwyn Jones (Author of [New Treaty, New Tradition: Reconciling New Zealand and Māori Law](#), which provides a thorough historical, cultural, and social context for tikanga Māori and its place within the evolution of New Zealand’s power and governance dynamics). In our discussion, he mentioned numerous examples of how tikanga and its principles are drawn upon frequently in legal and judicial arrangements, especially in Treaty settlement processes. Additionally, he states that “in some areas of life and some activities, you’d still find tikanga as kind of the guiding law and guiding legal system” such

as in the marae or customary areas of society (C. Jones, personal communication, February 10, 2021; selected interview transcripts are presented in [Appendix C](#)).

One of the more compelling quotes of Jones' interview with regard to tikanga was the mention of an example that drew upon Anishinaabe Indigenous law:

“There's a Canadian Indigenous legal scholar, probably not too far from where you are, an Anishinaabe scholar called [John Borrows](#). And he was talking about a particular river in Toronto which used to be a full river, but has been sort of built up over the top of and is now just a trickle of a stream, but every now and again when there's a lot of rain the river sort of floods and rises up and sort of makes its presence felt again, and so he compares that to Indigenous law.

He said in settler states, it might've been built up over the top of, but it hasn't completely vanished and you sometimes see it coming through and filling in the gaps, and certainly in our New Zealand legal system, increasingly seeing the ways in which tikanga is being drawn on as a source of law to help to fill in some of the gaps.”

(C. Jones, February 10, 2021).

Our expert interviews on this topic also shared similar perspectives. The primary and aggregate dimensions revolving around tikanga in terms of governance and community management are noted below as the basis for a framework for processes and agreements:

Table 1

Objective 1 Data Analysis of Expert Interviews

Expert Source	First Order Themes	Second Order Themes	Aggregate Dimensions
Dr. Carwyn Jones	"In some areas of life and some activities, you'd still find tikanga as kind of the guiding law and guiding legal system."	Although tikanga is not as prevalent as it once was, it still holds merit in many circles.	The presence of tikanga is diminished.
Mr. Thomas Malcolm	"[Tikanga and Māori values] should be at the forefront [of governance policy]. If I was to take everything right back, that Māori lead the conversation or lead the governance, they develop all the policies with tikanga and kawa (Māori protocol or etiquette) in mind, te Māori protocols at the forefront."	'If we could restart,' tikanga and Māori would/should be at the forefront of decision - making.	
Dr. Carwyn Jones	Example of the Supreme Court drawing onto tikanga to inform upon a unique appeal circumstance.	Legislative and judicial bodies in New Zealand often draw on tikanga to 'fill in the gaps.'	Existing power structures drawing on tikanga and mātauranga.
Anonymous Expert	[Speaking of use of Māori knowledge] It's been very tokenistic, that unfortunately despite these attempts, it is often either an afterthought or it's just including a few words here and there. There's been criticism about how mātauranga Māori has become the buzzword it seems within science and environmental management and those sorts of things. So it's generally being separated from Māori society values like language basically, everything.	Mātauranga Māori often becoming a repository or buzzword that simply informs upon pre-existing structures in a segregated manner.	
Dr. Nicolas Lewis	"Māori worldviews and tikanga Māori emphasizes the holistic notion, has a very strong holistic notion of environments that include people, and non-human actors, environmental forces."	Tikanga holds a unique perspective on EBM and human interactions with the environment.	Tikanga is capable of managing resources and fixing environmental issues.
Dr. Nicolas Lewis	"There are no inherent differences with an EBM, so there's nothing in the legislation, nothing in the way that Māori operate as far as I've seen to suggest that they could not pick up EBM and stick it into a Māori [context]."	Māori have the capability to manage an environment using customary values.	
Dr. Billy van Uitregt	"So it's about siding them side by side with parity and not just using the bits of matauranga Māori to plug into the western world view that fit nicely, but rather challenging your western world view using mātauranga Māori."	Applying both Pākehā and Māori perspectives with parity; challenge your worldview against it.	Two-eyed seeing.
Anonymous Expert	Māori would say the same with regards to what the intentions of the Treaty was. And Māori see it as being able to walk between worlds. So you can choose to walk in the Māori world or the Pākehā one or between worlds.	Being able to "walk between worlds" is critical to bridging this gap of perspective and knowledge.	

Note. Adapted from interviews with Carwyn Jones, Thomas Malcolm, Nicolas Lewis, Vincent van Uitregt, and an anonymous expert.


From these interviews, it is obvious there is an issue surrounding the lack of Māori involvement and Māori voices not being heard. Every aggregate dimension that came out of the interviews suggest there is some level of oppression and lack of inclusion of Māori views and values when it comes to governance and decision-making.

4.2: Document Cultural and Community Perspectives

Our second objective research primarily relied upon interviews of experts, results from New Zealand Election Study data and our survey data. With regard to our interviews, the community management in question mostly related to the expert's experience in their respective fields which ranged from Treaty settlement entities and processes to private consulting to other National Science Challenge endeavors.

We discovered an overall theme amongst both Māori and non-Māori experts that Māori iwi should have more control over environmental management, and mātauranga Māori should be further paired with governance structures. Our results found consistent patterns that Māori do not want to be viewed as a resource to apply to environmental management, but rather wanting a more direct role and control over decisions. Māori are often having to aid the Crown in their governance of the environment, rather than the Crown and local government supporting Māori efforts through funding initiatives that Māori themselves identify. Another recurring view was that the Crown and government officials lack fundamental knowledge of the Treaty of Waitangi, its principles, and its measured interpretation, as well as Māori beliefs and values.

Some perspectives suggest that Māori have been researched at length by the Crown and western science, always being asked to explain what tikanga Māori is along with their other beliefs, but nobody ever questions what western science is and the reasoning behind their logic. This has perpetuated the uneven power dynamic that leads to Pākehā often viewing Māori as an aside, or a politicized repository of knowledge without the same view of Pākehā knowledge - further widening the bridge in the discussion of co-management (of natural resources). Many Pākehā view Māori as an aid to western science and the Māori want to be able to handle things themselves in a sovereign manner. Our results illustrated common perspectives from multiple experts that the government should take more responsibility towards identifying faults and rectifying



past grievances while working towards holding a greater respect and understanding of Māori views towards resource management.

Additionally, our interviewees all believe there continue to be elements of oppression or lack of genuine Māori involvement. At least two of our interviewees believed there is some level of systemic racism throughout New Zealand (as evidenced by Treaty grievances and breaches). An anonymous expert also discussed the diversity among Māori tribes across New Zealand, noting that Māori are often generalized as all having shared culture, values, relations, and management of the environment when this is not true across iwi.

Overall, our results resoundingly found that Māori are unsatisfied with the way they are often viewed by the Crown and western science and how they are situated in power sharing and authoritative dynamics, and they want to have more of a voice rather than often serving a consultant or repository of Indigenous information and scholarship.

Below is a second aggregate chart detailing some of the common themes and points revealed in these expert interviews (additional information can be found in [Appendix C](#)).

Table 2

Objective 2 Data Analysis of Expert Interviews

Expert Source	First Order Themes	Second Order Themes	Aggregate Dimensions
Dr. Carwyn Jones	“And so one of the things that you see, a lot for these post-settlement governance entities trying to build in, for example, membership is really important in these contexts because that determines who’s entitled to benefit from the settlement.”	Post-settlement governance bodies including authority and voice as key principles.	Authority and voice are often forgotten factors when considering membership in decision-making.
Dr. Carwyn Jones	“And some of those kind of co-governance arrangements do start to have a constitutional gloss at least, in the sense of they do start to change who starts to make decisions, what are the things that get taken into account in decision-making, what are the mechanisms for making or challenging those decisions, and to some extent there are real questions about whose law is going to have a say or have sway in a lot of this as well.”	Co-governance arrangement having flexible legislation to reflect accurate representation.	
Dr. Carwyn Jones	“Financially, much of the land that we (Māori) would’ve liked to have had returned was no longer in government hands but in private hands, and that’s excluded completely from the settlement.”	Treaty settlements often run into issues regarding land ownership, commerce, and cultural issues.	Limitations of the Treaty settlement process; can’t address full grievances.
Mr. Thomas Malcolm	“[Tikanga and Māori values] should be at the forefront [of governance policy]. If I was to take everything right back, that Māori lead the conversation or lead the governance, they develop all the policies with tikanga and kawa (Māori protocol or etiquette) in mind, te Māori protocols at the forefront.”	‘If we could restart,’ tikanga and Māori would/should be at the forefront of decision-making.	Need for Māori authority in decision-making and governance.
Dr. Nicolas Lewis	[Speaks about Māori knowledge] I would say that about the whole thing with the Māori approach. I’ve had to learn through time that this is a huge asset to this place because it puts a break on technocratic lunacy, but it also gives us a sense of how we might do these things and do these things differently. It’s taking New Zealand a long time to wake up to the recognition that Māori are not an impediment to development or democracy, but are assets in producing something that is better.	Māori knowledge supplementing environmental decision-making.	
Dr. Billy van Uitregt	“I would much prefer it’s not my responsibility for the Pākehā or governments to decolonize their practice. They need to deconstruct the power structures that they enacted on others. I don’t want this to be my responsibility because it’s hard enough to do the job. If the oppressors who enact these power structures take responsibility for deconstructing them then that’s far better for me and I can get on and actually do the job rather than do that.”	Māori often needing to decolonize existing power structures and their practices, not the government itself.	The need for Crown awareness & importance of Māori-based education.
Anonymous Expert	“I get into a room I’m with people from the Crown or government officials or even local government officials ...they don’t know what the Treaty principles are, or let alone any of the concepts we are talking about, they haven’t even read the agreement we’re meant to have which governs our co-governance arrangements or partnerships. So they really think that there’s a lack, they feel like they’re constantly having to educate people, so it takes a huge amount of time.”	Inherent disconnect and lack of understanding of core Treaty principles and co-governance arrangements.	

Note. Adapted from interviews with Carwyn Jones, Thomas Malcolm, Nicolas Lewis, Vincent van Uitregt, and an anonymous expert.

These interviews convey how Māori are constantly fighting to gain back the 50-50 power they are entitled to, based on the Treaty of Waitangi. Oftentimes, Māori are overlooked when it comes to decision-making, governance, and societal awareness, which makes them continuously lose the power they once had and lose trust in the power systems that replaced them.

Pertinent New Zealand Election Study Data

As part of documenting community perspectives, we consulted the [New Zealand Election Study](#) records. The New Zealand Election Study was launched in the 1990s and surveys a sample of electoral roles in the country every three years; the most recently published survey data is for the 2017 election cycle in New Zealand which contained just over 92 percent of those estimated to be eligible to vote (*New Zealand Election Study - Results from the 2017 NZES*, 2017). The 2017 NZES had 3,445 respondents randomly sampled across the New Zealand electorate. We evaluated the results to collect a snapshot of public perception as a baseline to understand preconceptions about community and societal dynamics.

About the demographics and science of the survey, per the NZES, “the data below has been weighted by Māori/General electorates, age, gender (from the rolls), highest educational qualification (from the Household Labour force Survey and the 2013 census), and party vote and turnout (corrected from the marked rolls), in order to be as representative as possible of those on the rolls (*New Zealand Election Study - Results from the 2017 NZES*, 2017). According to the 2017 NZES, of the 3,445 respondents, 13.71% or about 472 respondents identified as being of Māori ethnicity. This is again well-representative of the demographic as of June 2017, where 15.3% of New Zealand’s population was of Māori ethnicity (*New Zealand Election Study - Results from the 2017 NZES*, 2017).

Below are the results from a series of questions that distill these common perceptions of community and societal dynamics:

2017 NZES Section A: Politics, the Election, and You

Figure 9

2017 NZES Question A11a

11a). Minorities should adapt to customs and traditions of the majority.

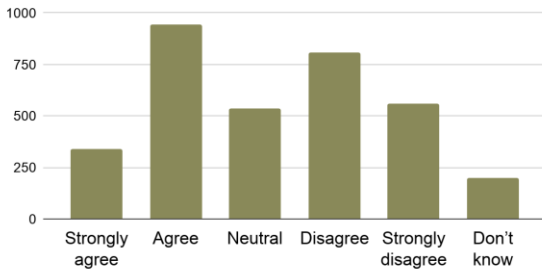
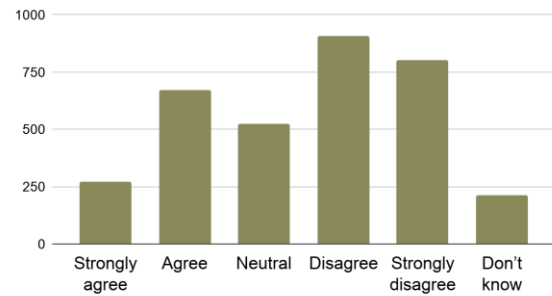


Figure 10

2017 NZES Question A11b

11b). The will of the majority will always prevail.



2017 NZES Section C: Your Opinions

Figure 11

2017 NZES Question C5i

5i). Should there be more or less public spending on the environment?

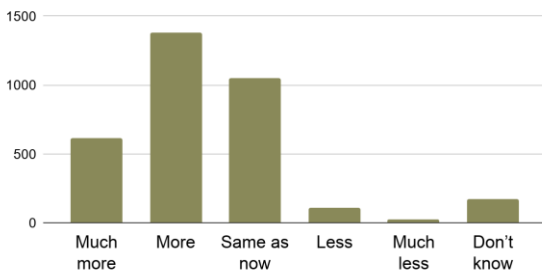


Figure 12

2017 NZES Question C8

8). Do more to protect the environment or to encourage economic development?

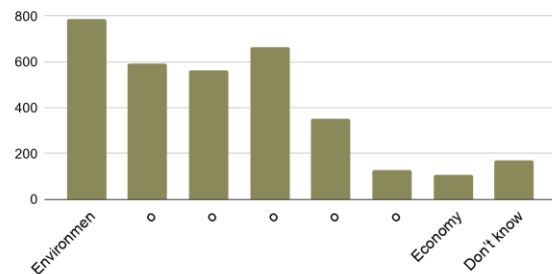


Figure 13

2017 NZES Question C10b

10b). Reference to the Treaty of Waitangi should be removed from the law.

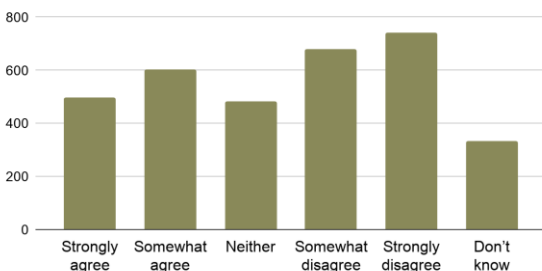


Figure 14

2017 NZES Question C10c

10c). Māori should have more say in all government decisions.

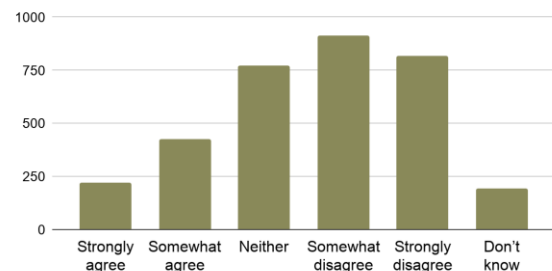
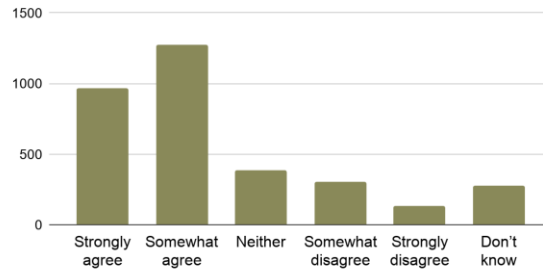


Figure 15

2017 NZES Question C11b

11b). To act against climate change, policies are needed to reduce carbon emissions.

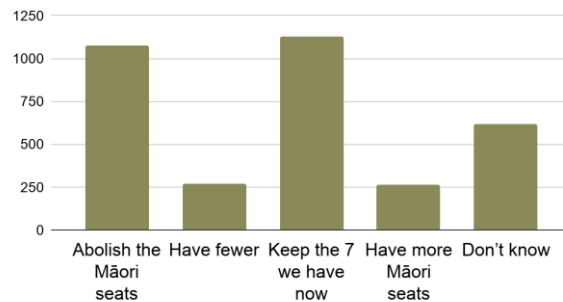


2017 NZES Section E: Government, Participation, MPs, and Representation

Figure 16

2017 NZES Question E3

3). On the future of Māori seats in Parliament:



Note. Figures 9-16 are adapted from the results from the 2017 NZES. From *New Zealand Election Study - Results from the 2017 NZES*, 2017, (http://www.nzes.org/exec/show/2017_NZES+Results).

The New Zealand election studies clearly indicate the people would like to see more action taken towards improving the current state of the environment; however, the study shows the topic of Māori involvement in decision-making and governance is quite contentious across the whole of the population. The study does suggest there is a mixed sense of respect and desire for inclusion of Māori and other minority cultures across New Zealand; however, a large portion of the population did tend to agree that Māori culture should not have to adapt to the traditions of the majority and the will of the majority does not always prevail. Overall, the public is against more Māori involvement in government decisions, with more than 50% of the respondents disagreeing with the prospect of increased involvement. It is important to note that these results are reflective of the

population of New Zealand wherein just 15% are Māori. It is also important to consider the possible effect the wording of a survey question has on its results. This is particularly relevant for the survey question shown in Figure 14, with the question asking about Māori involvement in all government decisions, which can be interpreted in many different ways because of the phrase ‘all government decisions,’ and can be confusing.


4.3: Compare Strategies and Outcomes in Governance

Through both our review of case studies and expert interviews, our results pointed to the importance of a localized system of environmental management, at the iwi level as a strategy for achieving outcomes which restore biological heritage. The point was made repeatedly across interviews that tikanga and mātauranga generally cannot function well on a national level, and instead that values and traditions often vary from iwi to iwi. Māori connect with a strong sense of place which reinforces their knowledge of their locality and tūrangawaewae (place of standing), and enables a better foundation to make decisions surrounding management of the local environment. Additionally, community-based experiences and practices are often site-specific and consequently differ from those associated with the broader science guidelines. One specific example was provided in our interview of an [anonymous expert](#), who described a telling example:

“For instance, with snapper, Hokianga and Ngāpuhi only have a snapper which is actually undersized, because the big ones are the breeders. That contrasts with the governance rules around fishing, you only can get the big ones. The iwi argue that actually, you should get the small ones because that's how you maintain the breeding and everything. Elsewhere in New Zealand they don't have the same practices.”

(Anonymous Expert, February 23, 2021).

This idea of merging and balancing western science and ideologies equally alongside tikanga Māori also impacted our case study analysis. In our [three case studies](#), both of these belief systems were considered and built into decision-making strategies, identification of process indicators, and measures of successful bioheritage outcomes of the governance models. All three included Māori-based approaches to environmental



management; respecting the connection Māori hold with their local environment, and the significance of these resources in their culture. These strategies are coupled with indicators and outcomes that also reflect Māori principles, such as the mauri (life essence) of their associated environments, and mahinga kai (food-gathering). In addition to these more spiritual indicators and outcomes, western scientific principles are also applied to co-governance. Measurable environmental health values are also used as indicators, such as water quality, species population statistics, and biodiversity. These statistical indicators are also quantitative outcomes for governance frameworks, as well as funding capabilities, projects being completed, and measurable factors of community engagement. Additional non-environmentally based indicators, namely representation in decision-making, can also measure Māori involvement and success of co-governance models. When merged within a locally driven approach to environmental legislation, these key strategies, indicators, and outcomes can provide an optimal framework for working towards restoring the bioheritage of Aotearoa.

When interviewing our expert for successful elements or mechanisms that exist in governance models, one common idea across the responses was flexibility. The ability of a governance model to adapt to any problems it is facing and change over time is key to long term success, as any rigid structure will eventually fail to meet expectations and address ever changing problems. Another important part of a successful governance model according to our experts is legislative strength. Having a piece of legislation or specific law to back up governance decision-making allows for the model to have more authority and be stronger in enforcing policy. Having specific principles or relationships cemented in policy provides durability to the co-governance model, setting it up for long term success. This is true specifically when adherence to the Treaty of Waitangi is considered, another important part of a successful governance model. As intended with its measured interpretation, the Treaty provides a baseline for shared, 50-50 co-governance and the application of the Treaty sets the standard for how co-governance should be run, and governs the broad relationship and proper Māori empowerment. This baseline for co-governance is at the core of the case studies we explored, which all led to positive bioheritage outcomes and better power sharing. Transparency, accountability, Treaty-based, and revitalization-driven principles (along with other factors summarized in

[Appendix D](#)) of governance were identified, through our body of evidence, as successful approaches to environmental management, which lend better towards restoring biological heritage and preserving native species.

Below are our syntheses of three case studies in New Zealand that explore respective approaches to strategic planning to achieve positive biological heritage outcomes and the three goals of New Zealand's Biological Heritage National Science Challenge: whakamana (empower), tiaki (protect), and whakahou (restore).

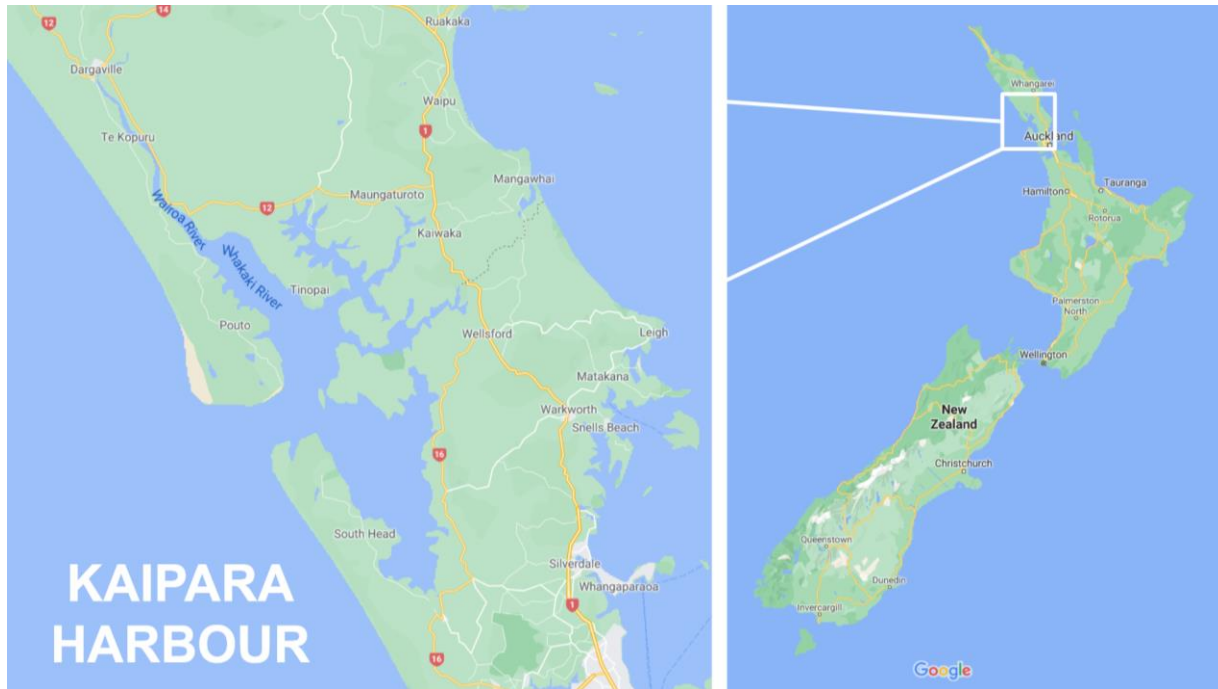
4.3.1: Case Study 1: Kaipara Harbour

(Co-governance of natural resources)

The Kaipara Harbour is located on the west coast of New Zealand's North Island northwest of Auckland and is one of the largest estuaries in the country and is one of the world's largest harbor systems (Makey & Awatere, 2018, p. 4). According to the [Integrated Kaipara Harbor Management Group](#), "the [harbor and estuary system] is home to many high-value species such as the protected great white shark, the critically endangered Maui dolphin and over 150,000 northern hemisphere migrant wading birds that come to feed in the Kaipara" (Makey & Awatere, 2018, p. 4). Additionally, "the Kaipara contains some of the rarest ecosystems in Aotearoa New Zealand including sand-dune lands, seagrass, freshwater, and estuarine wetlands as well as being an important nursery for juvenile fish" (see Figure 17) (Morrison et al., 2014).

Figure 17

Kaipara Harbor Map



Note. Adapted from Google Maps, 2021.

The hapū (clan or kinship group, smaller political unit) of northern Kaipara, Te Uri o Hau, filed a Treaty grievance against the Crown in 2002 which formalized the Te Uri o Hau Claims Settlement Act of 2002 providing a cultural and commercial redress of the lands in question in accordance with the Treaty of Waitangi; this included the Kaipara (Makey & Awatere, 2018, p. 4). The post-settlement governance entity that was established years later created a unique interplay and co-governance mechanism with the hapū and iwi of the Kaipara area.

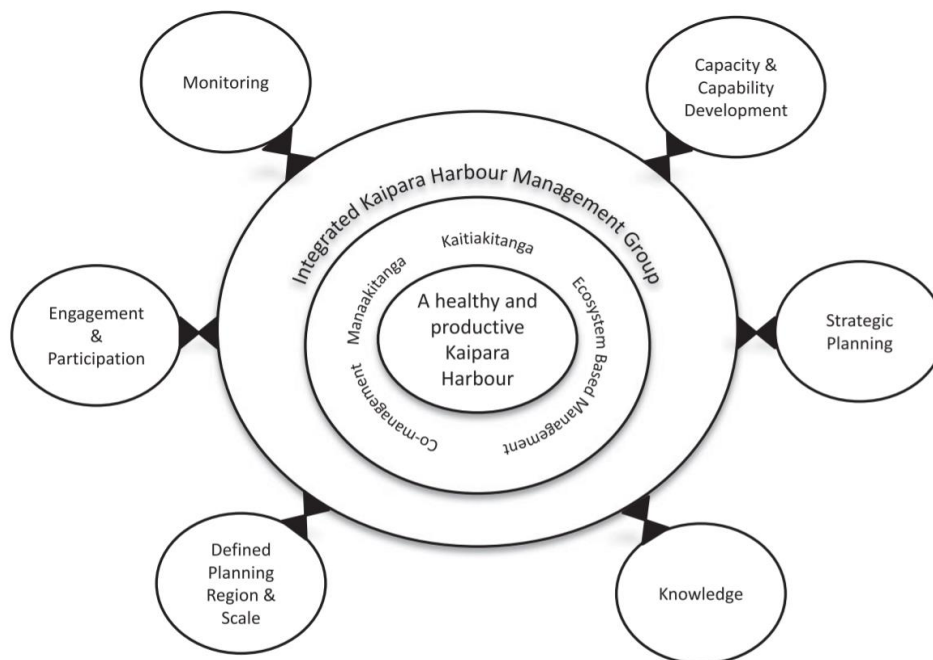
In 2005, the local group, Ngā Kaitiaki Taiao o Kaipara, and this post-settlement entity, [Te Uri o Hau Settlement Trust](#), worked in leading the establishment of the [Integrated Kaipara Harbor Management Group](#) (or IKHMG). In some ways, this governance mechanism is Treaty-based, considering it was established in part by a post-settlement governance body, but the models in place and creation of this group follow a strict co-governance approach between the many groups and partners around the Kaipara. Before the group's conception, the Kaipara in the 1990s was managed by several groups in a generally loose and conflicting manner, as each group applied

different management scales using different management philosophies (IKHMG, 2021). According to the IKHMG, these “agencies [applied] a plethora of various statutory regulations [... which, in turn,] has contributed to the continuing decline in the health [and] mauri of the Kaipara Harbour as a whole” (IKHMG, 2021). Further, the threats of overfishing, agricultural activity, climate change, and declining water quality played roles in accelerating the urge for better management (Makey & Awatere, 2018, p. 5), The IKHMG intended to counteract that and address the Treaty settlement redresses with its establishment, ultimately working to restore the biological heritage of the Kaipara and the surrounding region through a collective, group-informed entity.

The IKHMG between 2007 and 2014 established a framework for management called He Mahere Pāhekoheko Mō Kaipara Moana (translating to “a Plan to Integrate or Co-operate for Kaipara Harbor,” which is essentially a framework of management guidelines and their respective visions). He Mahere is shown below in Figure 18, where the visions are in the center of the chart and the strategies are in the outer circles:

Figure 18

IKHMG Environmental-Based Management Framework



Note. Framework chart from Black & McBean, 2016, (<https://doi.org/10.18584/iipj.2016.7.4.5>).

He Mahere is chronicled in much greater depth in Dr. Leane Makey and Dr. Shaun Awatere's research found [here](#). These broad strategies of IKHMG's framework are centered around the visions of EBM and integrating mātauranga Māori and other principles. It was important to not simply draw on tikanga and mātauranga Māori or western science, but rather to marry these principles within the system as one framework. Below is an excerpt from the IKHMG on more of the specifics behind their operating principles and collective strategy:

“Through the manaakitanga of Te Uri o Hau, IKHMG began as a partnership between the local and territorial authorities of the Kaipara Moana, Crown agencies, hapū/iwi, community groups, research institutions, industry sectors and Non-Government Organisations (NGOs).

These groups and agencies committed to share research, resources, initiatives and commitment to fulfil a shared vision of creating a 'healthy and productive Kaipara Harbour'. A ten-year strategy was developed; a research programme initiated, a field programme was set up centred on flagship farm exemplars of land and resource best practice. Quarterly hui, seminars and conferences were held to share information, ideas and enthusiasm. We maintain a presence at field days, rural events throughout the Kaipara catchment and nationally.

As the mana of IKHMG grew, it drew more people to its events: community groups, marae and mana whenua, individual landowners, fishers, interested locals and a growing number of industry and agriculture sectors. IKHMG representation is requested at most water quality and land management initiatives within the Kaipara catchment. It promoted a deep local concern about the health and value of the Harbour.”

(Home | Integrated Kaipara Harbour Management Group | Conservation | Northland, 2020)

From these strategies and principles that are exercised by the IKHMG and their He Mahere, there are observable indicators associated with the bioheritage outcomes achieved. Within the monitoring aspect of the IKHMG, outlined is the Te Uri o Hau principle of an Atua (deity) domain framework that describes these indicators (Makey & Awatere, 2018, p. 11) (see Figure 32 for a diagram of this Atua (departmental gods) domain framework in [Appendix A](#)). These domains, in accordance with tikanga, include biophysical indicators such as the abundance of species, social indicators such as

mahinga kai or the ability to provide food for traditional gatherings, and spiritual indicators such as mauri (Makey & Awatere, 2018, p. 11). Further, “a bi-cultural approach by IKHMG includes complementary indicators that are informed by western science (e.g., sediment loads) and community values (e.g., number of tree planting days for restoration)” (Makey & Awatere, 2018, p. 11). These bioheritage indicators found in the IKHMG He Mahere inform on the direct, measurable outcomes of the plan as a whole.

For the Kaipara Harbor, these bioheritage outcomes include improving the well-being of the community, restoring fish and marine wildlife stocks, gap analyses and feedback systems, [the funding and completion of projects by the IKHMG and its partners](#), meetings and communication, and community engagement. These outcomes, in turn, help to produce and communicate effective strategies, indicators, and solutions to addressing the degradation of the Kaipara and its surrounding tributaries, regions, resources, and communities.

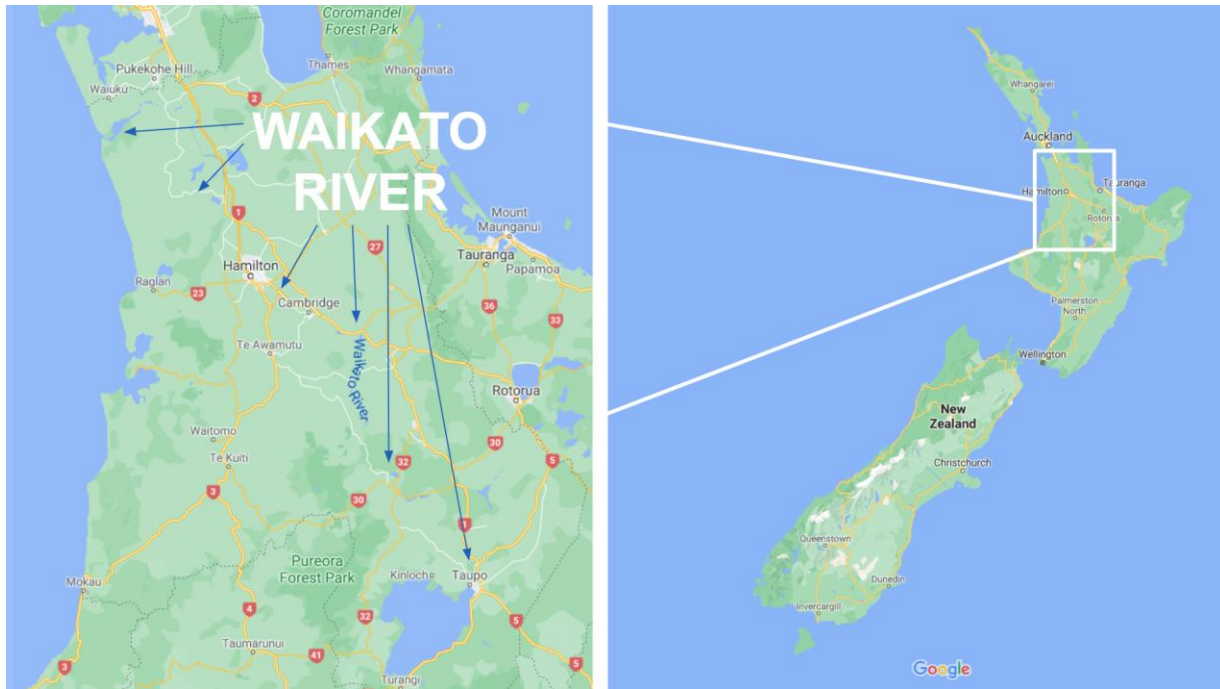
4.3.2: Case Study 2: Waikato River

(Treaty-based or Treaty settlement governance of natural resources)

The [Waikato River](#) stretches across New Zealand’s North Island, running from Lake Taupo to Port Waikato. At 425 kilometers (264 miles) in length, and a catchment of 14,260 km² (5,506 mi²), it is the longest river in Aotearoa (*About the Waikato River*, 2019). The Waikato River has been a source of food for local Māori iwi along the catchment for hundreds of years, providing fish, eels and plants, as well as a means of transportation by waka (canoe) (see map below in Figure 19) ([Waikato River Authority](#), 2021).

Figure 19

Waikato River Map



Note. Adapted from Google Maps, 2021.


As New Zealand became more industrialized, especially in the 1970s, farming and development along the river increased substantially, partially due to a lack of government regulation. This in turn took a toll on the land, and led to fertilizer runoff polluting the river (Waikato River Authority, 2021). Additionally, the use of hydroelectric power plants along the length of the river has increased pollution and hazardous contaminants, namely Nitrogen, which promotes toxic algae growth and degrades marine life ([Leaman & Smallman](#), 2013). According to the Waikato River Authority, “this degradation of the River and its catchment has severely compromised Waikato River Iwi in their ability to exercise kaitiakitanga or conduct their tikanga and kawa” (Waikato River Authority, 2021).

As a result of the decline in the overall health of the Waikato River, in 1987 a claim was filed with the Waitangi Tribunal to rectify the seizure, abuse, and degradation of native Māori lands and resources, and the resulting deterioration of the river and its surrounding areas. The Treaty Settlement process that ensued led to the formation of the Guardians Establishment Committee made up of the Crown and regional iwi. Their eventual 2009 *Vision and Strategy for the Waikato River*, which in turn formed a major

part of the [Waikato River Raupatu Claim](#) of 2010 that ultimately founded the Waikato River Authority (WRA) (Waikato River Authority, 2021).

The Waikato River Authority's "vision is for a future where a healthy Waikato River sustains abundant life and prosperous communities who, in turn, are all responsible for restoring and protecting the health and wellbeing of the Waikato River, and all it embraces, for generations to come" ([Waikato River Authority](#), 2021). The Waikato River Raupatu Claim outlines many of the strategies and management policies instituted by the WRA. The WRA is made up of 10 members: a combination of Māori representatives from different iwi, as well as Crown appointees. There exists strict regulations and restrictions about who can sit in each position of the Authority, as well as who can appoint members, in order to maintain the co-governance makeup of the WRA (Waikato River Raupatu Claim, 2021, p. 87). A main strategy of the WRA co-governance model is recognition and respect for Māori beliefs and thoughts towards the Waikato River; "the River has its own mauri, its own spiritual energy and its own powerful identity. It is a single indivisible being" (Waikato River Raupatu Claim, 2021, p. 69). This inclusion of Māori ideals goes as far as instituting tikanga (Māori law) and mātauranga (Māori knowledge) into the WRA's governance and management of the Waikato River. A key point in the strategies outlined by The Waikato River Raupatu Claim is the establishment of concrete goals and "targets for improving the health and wellbeing of the Waikato River mātauranga Māori and the latest available scientific methods" (Waikato River Raupatu Claim, 2021, pp. 72-73); blending and use of both native knowledge and more western frameworks, as well as the establishment of the current "health" of the River as a baseline. Additional strategies emphasized by the WRA include the promotion of education and public knowledge of the River and its health, and the improvement of relationships between the Crown and local iwi (Waikato River Raupatu Claim, 2021, p. 73).

These strategies for the restoration of the Waikato have related indicators that ultimately can assess the effectiveness of their approaches and policies, specifically as it pertains to biological heritage and the scope of our project. One major indicator is the health of the River, in both the spiritual or intrinsic sense according to Māori beliefs, and the more measurable, scientific sense of health, such as the water quality or levels of different chemicals or pollutants existing in the water. These measurable outcomes and

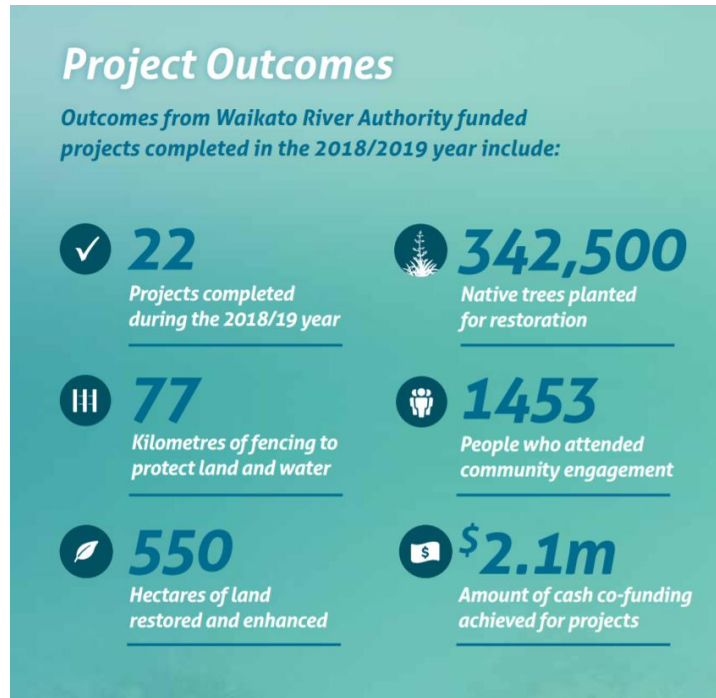


indicators of the success of the Waikato River Authority governance model rely upon the aforementioned strategy of establishing a baseline for the River's starting health. Another indicator for the success of the WRA includes the number of programs or projects that have been funded or completed as well as their engagement with the surrounding community, as this has implications for the wider range of work completed, as well as the public knowledge of the WRA's efforts. Finally, an outcome such as the level of public use and reliance on the Waikato River can be indicative of its overall health and the public's opinion on it, to measure the success of the WRA's projects and programs.

Outcomes of the Waikato River Authorities restoration and protection of the Waikato River can be seen in the [WRA Annual Report](#). As seen in Figure 20, measurable scientific outcomes of the most recently published report (2019) includes 22 projects completed, ranging from wetland restoration to erosion management, \$2.1M (NZD) in funding, 342,500 native trees planted, 550 hectares of land restored and enhanced, and 77km of fencing placed to protect land and water. Additionally, 1,453 people were involved in projects, speaking to the overall public engagement of the project (WRA Annual Report, 2019, p. 6).

Figure 20

WRA 2018/2019 Project Outcomes



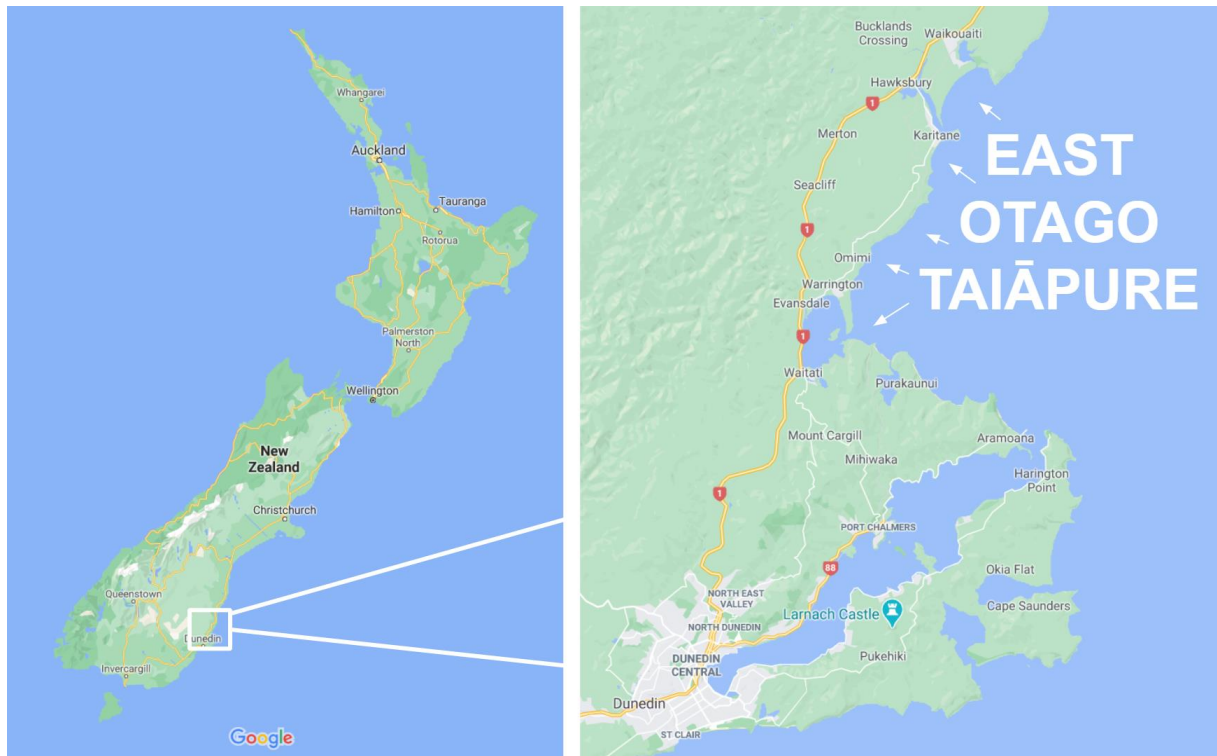
Note. From Waikato River Authority [Annual Report 2019](#).

Similar to the Kaipara Harbor case study, the WRA was born out of a Treaty settlement, wherein the ultimate outcome was the formation of a management group, the WRA. These instances both produce a localized, community-driven approach to management that is informed by all values and mindsets with even representation and authority to make change. The success of the WRA's Treaty-based co-governance model is evident in the positive bioheritage and community outcomes from their projects detailed in their annual report. From this model for governance based on settlements from the Treaty of Waitangi, we can synthesize strategies and mechanisms to work towards restoring New Zealand's biological heritage.

4.3.3: Case Study 3: East Otago Taiāpure (Tikanga-based governance of natural resources)


Figure 21

East Otago Taiāpure Map



Note. Adapted from Google Maps, 2021.

Just north of Dunedin lies the customary fishery or taiāpure of East Otago, part of the region Otago on New Zealand's South Island (as shown in Figure 21). The East Otago coastline has been known for its great fishing in years past, however, as the fish stock began to deplete, members of the Kati Huirapa Runaka ki Puketeraki (local iwi) stepped in. Specifically, the stock of a highly sought-after shellfish often used to make jewelry called paua, was beginning to run dry in the waters off East Otago. In March of 1992, the local iwi applied to make the East Otago coastline a taiāpure ([East Otago Taiāpure Management Committee](#), 2013). This act caused outrage among locals to East Otago, and many believed they were attempting to shut down the fishing in the area for everyone. After seven years of politically charged hearings and meetings, the East Otago Taiāpure



was established which allowed for the Māori iwi to manage the area in compliance with the Taiāpure Management Committee. The Taiāpure's vision is for a “sustainable, healthy, abundant and accessible fishery inside the Taiāpure that provides for the community's customary, recreational and commercial needs” ([East Otago Taiāpure Management Plan](#), 2008). Outlined in their Management Plan, the Taiāpure Management Committee must be in compliance with many rules such as performing studies and research on the fish populations while consulting with the local iwi. The committee must also use the Te Rūnanga o Ngāi Tahu (local tribe's) GIS (geographic information system) database when performing research. There were also fishing regulations put in place such as a daily bag limit of five pāua (sea snail) (Chamberlain, 2016). The committee must ensure no sewage is dumped in the ocean within 500 meters of the coast, and work with the Ministry of Agriculture and Forestry to stop any non-native or unwanted pest from coming into the fishery (East Otago Taiāpure Management Committee, 2013).

The creation of the Taiāpure allowed for local Māori iwi to co-manage the East Otago coast and fishing alongside the East Otago Management Committee with the Māori iwi being able to oversee any operations or research the management committee performed. The main strategy used in this model was having a commitment to a healthy relationship and management plan between local Māori the management committee through the promotion of shared space, dialogue, and tikanga-based management. This is displayed through the management plan which requires the management committee to be in constant communication with local Māori. The management plan outlined multiple rules that the East Otago Management Committee has to comply with, and because local Māori iwi can consult with the management committee in research studies, this offers a necessary level of accountability in the system. The management committee has significantly worked towards informing and educating the community of the rules and regulations of the Taiāpure, public awareness being a major indicator in the success of the Taiāpure's management.

Preventing pollution and introduction of potentially invasive species is also a key point in the Taiāpure management plan. Discharge of human waste and sewage can lead to negative impacts on local wildlife and the ecosystem as a whole, and the region's bioheritage can be impacted by foreign species introduction through illegal reseeding of

shellfish, or physical human transferring of species. Pest control will be utilized by the committee to mitigate these issues if need be. Limiting these pollutants and hazardous species works towards making all harvested shellfish fit for human consumption. As previously mentioned, strict daily limits instituted by the committee also protect local shellfish and marine species, allowing them to grow and maintain a healthy population. These limits, backed by strong legislation, ensures that poachers are held accountable for their actions. In one specific case of poaching, a man had his diving gear confiscated, was fined \$600, and sentenced to 140 hours of community service for poaching nine times the daily limit of paua in one day (Chamberlain, 2016). This shows the community the regulations in place are serious, and there will be significant consequences if broken, holding poachers accountable. These restrictions however do not entirely prevent individual negligence. In 2016, two local university students poached 459 undersized pāua (not harvestable yet). This made the harvestable pāua population decrease to just 4% from 15%. While the two individuals were punished, this still dealt a huge blow to the pāua population, requiring years for the population to recover. East Otago Taiāpure committee scientific adviser Chris Hepburn commented if the regulations were followed and people did not poach, the stock would be much better for fishing (Chamberlain, 2016).

Overall, combining these western scientific concepts of population monitoring statistics and indicators, with conventional Māori management has provided a path to restoring biological heritage to the East Otago coastline by means of customary, tikanga-based policies.

4.3.4: Summary of Case Study Analysis

Below is a table detailing the strategies, indicators, and outcomes of each case study as it relates to [the goals of New Zealand's Biological Heritage National Science Challenge](#). We have also produced two diagrams to display these effective strategies and positive bioheritage outcomes in Figures 22 and 23.

Table 3

Summary of Case Study Analyses

	<p>Strategies</p> <p>Elements of this model that are aimed at working towards achieving its goals</p>	<p>Indicators</p> <p>General ways in which the success of the model can be assessed</p>	<p>Outcomes</p> <p>Results or achievements of this model in working towards bioheritage</p>
<p><u>Kaipara Harbour</u></p> <p>Legislation</p> <p>Settlement Trust</p>	<ul style="list-style-type: none"> • Iwi-centered origins of vision • Mātauranga Māori (knowledge) • Planning grounded in (w)holistic responsibility of partners • Community and regional knowledge and participation • Well-defined region and scale of authority and jurisdiction 	<ul style="list-style-type: none"> • Atua domain framework • Abundance of species • Biophysical (biodiversity of species) • Social (mahinga kai) • Spiritual (mauri) • Science (sediment loads) 	<ul style="list-style-type: none"> • Dedicated IKHMG meetings • Community engagement • Kaipara Moana Remediation • Secure sources of funding • Projects completed • Management informed bilaterally • Knowledge assessment
<p><u>Waikato River</u></p> <p>Legislation</p> <p>2019 Report</p>	<ul style="list-style-type: none"> • Recognition of Māori beliefs and river degradation • Mātauranga Māori (knowledge) • WRA has defined representation • Developing, meeting health targets informed by science • “Whole of river” approach • Treaty principle driven 	<ul style="list-style-type: none"> • Regional environmental health • River quality and access • Protection and empowerment of significant sites (fisheries, flora) • Sharing of all levels of expertise and experience • Authority and prestige (te mana o te awa) of the River 	<ul style="list-style-type: none"> • 22 completed projects • 550 hectares of land restored • \$2.1m funding generated • 1,453 community participants • Fencing installed • Restoration of Māori iwi connection to the Waikato
<p><u>East Otago Taiāpure</u></p> <p>Legislation</p>	<ul style="list-style-type: none"> • Community-based taiāpure management committee • Accountability grounded in legislation and ministries • Tikanga-centered approach • Gazetted in accordance with Ministry of Fisheries • Well-defined description of taiāpure and its significances 	<ul style="list-style-type: none"> • Native population growth • Local community values • Tikanga • Representation on committee • Community education level • Monitoring of Taiāpure goals • Level of water pollution • Invasive species populations 	<ul style="list-style-type: none"> • Customary fishery access • Mitigation of degradation • Netting statistics • Species population figures • Poachers being held accountable • Prevented introduction of invasive or new species

Note. Based upon our team’s case study synthesis above.

Figure 22

Common Successful Governance Strategies

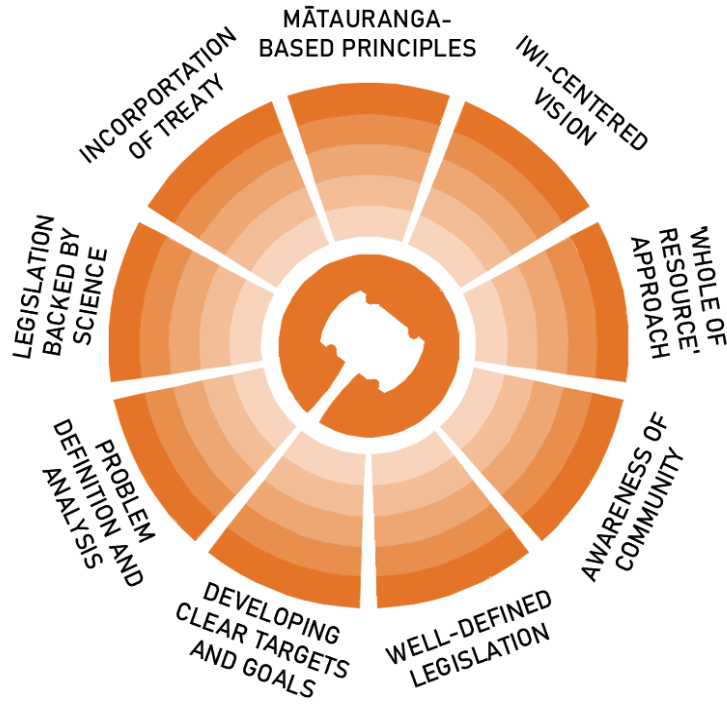
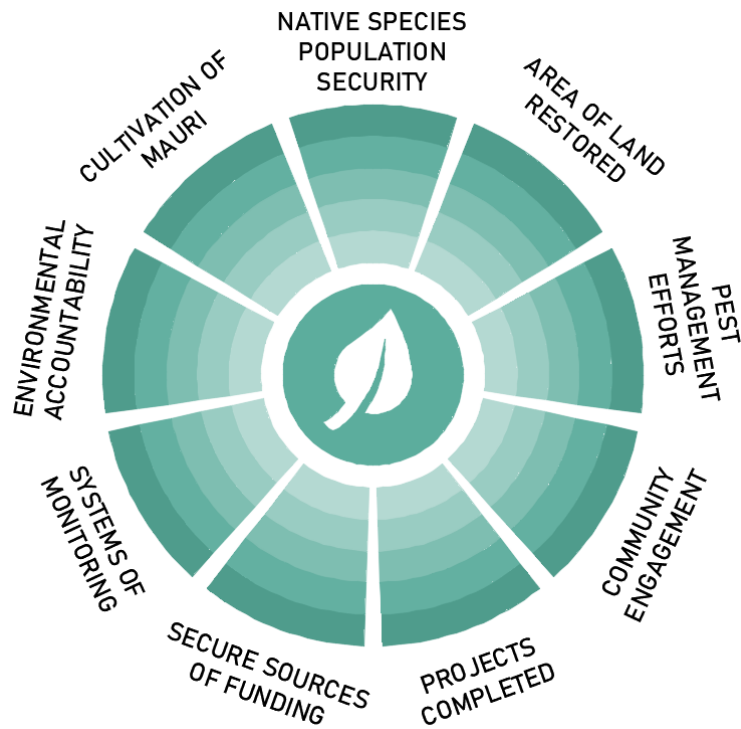


Figure 23

Examples of Positive Bioheritage Outcomes



4.3.5: Organizing Common Indicators for Effective EBM

After interviewing experts and conducting the case study synthesis, we decided to shift away from the idea of an assessment rubric, and instead provide a framework of common indicators and important mechanisms that we found effective in working towards restoring Aotearoa's biological heritage.

We developed a group of common indicators that, based on our research, are generally linked to the effectiveness of governance models that pertain to the management of natural resources. We wanted to communicate the common indicators and strategies found in the above case studies and document their interplay in producing effective biological heritage outcomes. This evaluation was not done in a quantitative manner, but rather a qualitative manner, focusing on the themes, traits, and indicators of successful outcomes vital to existing governance models. We developed these indicators based on the synthesis of the three case studies above, alongside our literature review of additional [case studies](#) that explored a similar situation with Inuit Native Americans in Alaska and Canada and their relationship with the governance of natural resources.

The indicators took into account the experiences and perspectives of interviewees and respondents from our preliminary objectives. Rather than focusing on the distinct strategies that were implemented, such as the technicalities behind a Treaty settlement, we focused on conveying the indicators present in cases that led to positive, measurable or spiritual biological heritage outcomes. The assessment of existing evaluative frameworks dealing with similar topics was reviewed to provide background and strategies to inform on the composition and nature of our indicators.

Dr. Nicolas Lewis in particular discouraged this approach, as a rigid rubric for assessing governance models does not align with the Māori idea of long-term management and long term goals, rather it looks more into short term individual interests, contradicting their overall worldview:

“[According to more scientific thinking]...the more that you tie policy down into fixed protocols and frameworks and rules, the better it is because it gives you these certainties through time. I would argue the complete opposite, that the more you tie an electoral cycle that asks for change and in many ways desires change, the more that you tie that into a rubric that doesn't allow for change, the more you get perverse outcomes.”

“So that sense of having a governance rubric that is essentially connected back to self interest is not going to work with Māori into the future.”

(N. Lewis, February 17, 2021).

We again intended for the governance model framework to be focused on management indicators that often lead to positive biological heritage outcomes. These indicators, that were created based on our body of work, include:

- **Treaty-based Principles** - the model's compliance with the Treaty of Waitangi, its principles, and its measured interpretation.
- **Two-Eyed Seeing Approach** - the model's capacity to utilize two-eyed seeing and merge Indigenous and western mindsets, focusing on shared values, experiences, and goals.
- **Whakahou and Restoration** - the model's empowerment or restoration of the local environment, in accordance with locally driven values and scientific knowledge.
- **Flexibility of Policy** - the model's systematic ability to adapt and mold with changing of times, electoral cycles, scientific knowledge, and community values.
- **Legislative Strength** - the model's strength of policy and enforcement powers, efficiency in withstanding legislative barriers.
- **Authority and Membership** - the model's overall integration of all peoples and their voices in the direct management of environmental policymaking.
- **Locally Driven Solutions** - the model's factoring in locally-tailored

knowledge, problem definitions, and solutions into decision-making and policy design.

- **Financial Capability** - the model's level of and access to funding and system building to encourage growth in the surrounding community and region.
- **Feedback and Knowledge Assessment** - the model's system of community feedback and assessment of self for reactive improvement over time.

The themes present in the biological heritage indicators are also in accordance with a [June 2020 report](#) on the effectiveness of the Resource Management Act of 1991. This report was conducted by the Resource Management Review Panel under the Ministry for the Environment. Their report ultimately recommended the importance of an integrated and efficient means by which the natural resources of New Zealand are managed (*New Directions for Resource Management in New Zealand, 2020*). These indicators are visualized below in Figure 24.

Figure 24

Indicators of Positive Bioheritage Outcomes



4.4: Discussion of Results

Our project results emphasized the importance of two-eyed seeing across all aspects of contemporary life. In order to bridge the gap between different worldviews, being able to ‘walk around in someone’s shoes’ and make an effort to understand their point of view is of critical importance as a baseline for future success in joint interactions. Rather than trying to insert mātauranga Māori as a decolonizer of existing power structures or to apply holistic western science to traditional knowledge, our results stressed the significance of working with both pillars of knowledge and channeling their sovereign and unique strengths into a holistic, communal product, in conjunction with Marshall’s method of two-eyed seeing. Further, this brings to light the dynamics of power sharing and authority in New Zealand, where often this shared approach is not taken and rather worldviews are segregated through clouded cultural lenses. Our project overwhelmingly unearthed this theme of disparate lenses of worldviews and how their unequal and politicized treatment has often perpetuated the power dynamics and hegemonic state at hand, ultimately skewing the even treatment of perspectives and knowledge as it applies to biological heritage and its restoration.

Another theme our project illustrated was focused on governmental and local authority and its interplay with membership and bioheritage outcomes. The lack of authority associated with Māori and Indigenous membership within decision-making bodies, in some instances, not only dampens their voice and impact on decision-making in all levels of governance, but also perpetuates a lack of trust in existing power structures from Māori and other groups. This was evidenced in our results by consistent Māori frustration in some Treaty settlement processes and an inherent lack of accountability and responsibility in other instances. This further highlights the disparity between hegemonic structures that exist centrally, regionally, and locally that fail to recognize local knowledge and perspectives in an even light and with equal authority.

Through case study synthesis and interviews, we discovered that, in these governance models, systems tend to be most effective when they are more localized with community-driven solutions to environmental problems. Tūrangaewae is known best by those who actually live there, and our results resoundingly supported the notion of community perspectives being empowered and allowed the resources to explore local

problems with locally-tailored solutions, informed by both mātauranga Māori and western science. Thomas Malcolm summarized this thematic dynamic best in this analogy:

“When it comes to environmental management, strategies are like toothbrushes, everyone’s got one but no one wants to use anyone else’s.”

(T. Malcolm, February 16, 2021).

Locally-tailored approaches to environmental management that have some level of access to funding through either post-settlement governance entities or Crown sources proved to be successful in producing effective bioheritage results in our case study synthesis. Trying to implement or orchestrate an overarching web of governance for the whole of New Zealand is virtually impossible due to these cultural, societal, and political differences that vary from place-to-place (as evidenced by our snapper example); this reinforces our findings’ emphasis on locally-tailored solutions. Additionally, the elements of flexibility and legislative grounding occur very frequently in these successful models. This is related to a model’s ability to adapt with election cycles and changing community perspectives while also being reinforced by well-defined legislation that enforces policy. This is needless to say that our findings stressed the nature of those policies to be not only to protect bioheritage, but also to incorporate the strengths of Māori and Pākehā worldviews by means of two-eyed seeing. As a whole, our results emphasized a ‘whole of resource’ approach to the management of natural resources. This is intended to approach the strict management of a resource (be it a river or lake) and take into account the ‘whole’ of all factors and partners at play as seen in our three case studies (or especially in the Whanganui River mana case).

Our body of work found that there are deep-rooted problems in how power is shared and voiced in environmental management in New Zealand. Bridging that gap involves a complex approach to community awareness, perspective, and the understanding of shared goals. Power sharing and community empowerment is critical to equalizing decision-making to holistically discuss and better protect bioheritage.

Chapter 5: Recommendations and Conclusion

Over the course of seven weeks of project planning and seven weeks of project execution, our project has investigated tikanga, cultural and community perspectives, and case studies of natural resource management in New Zealand in order to explore effective directions for the restoration of biological heritage. Again, the goals of New Zealand's Biological Heritage National Science Challenge are to empower, protect, and restore the environment and its resources by “[protecting and managing] New Zealand's biodiversity, [improving] our biosecurity, and [enhancing] our resilience to harmful organisms” (*Highlights from the National Science Challenges*, 2018). Based upon our body of work and research in accordance with our project's goal and objective, we have produced the following recommendations and conclusion:

5.1: Recommendations

Based upon the analysis of literature review, interview, survey results, and case study synthesis, our project's recommendations as it relates to the environment and the directives of New Zealand's Biological Heritage National Science Challenge are:

1. Encourage the concept of two-eyed seeing in governance to bridge the gap between Indigenous and western knowledge through shared goals and spaces.
2. Create a systematic awareness of existing power structures and dynamics to promote innovation in methods of power sharing between people.
3. Foster equal voice and authority in membership systems of governance and council decision-making processes.
4. Promote locally driven solutions to resource management to empower smaller-scale, community-based perspectives to places of standing.
5. Emphasize co-management principles to be grounded in legislation to supply proper authority and policy enforcement of shared values.

These recommendations are visualized in Figure 25:

Figure 25

Governance Recommendations to Improve Biological Heritage



These recommendations are in accordance with an approach to better address tikanga and mātauranga Māori as it relates to the environment, better apply cultural and community perspectives for better directions for the management of natural resources, and better organize common indicators and outcomes from EBM case studies in New Zealand. The recommendations can be measured by using outcome monitoring systems and knowledge assessments to measure progress and success in strategic planning and decision-making, ensuring accountability between Māori and Pākehā, and emphasizing a shared responsibility to protect the environment.

The nature of our recommendations are in accordance with the [United Nation Sustainable Development Goals 14 - Life Below Water, 15 - Life on Land, and 16 - Peace, Justice, and Strong Institutions](#), as well as the sum of the [National Sustainable Development Strategies \(NSDS\)](#).

1. Encourage Two-Eyed Seeing in Governance

Two-eyed seeing, based upon the theory by Albert Marshall, is helpful in creating an effective governance model because as evidenced in our interviews and case study synthesis, Māori law and values are either underappreciated, or taken in bits and pieces, used only to supplement western science. This often occurs because western science is dominant and viewed by some as superior in environment management practices. Dr. Billy van Uitregt discussed in our interview how western institutions have the power to veto because of the structures in place with westerners having the final say. Encouraging two-eyed seeing allows Māori to have more equal say in decision-making and it can offer more solutions or a different way of solving a problem. All three of the governance models studied in working towards our third objective implemented this combined approach, with western science and Māori law working together. Scientific indicators and outcomes are used towards measuring success, such as the Waikato River Authority measuring water quality or the East Otago Taiāpure measuring population statistics, but also more spiritual Māori indicators and outcomes such as an iwi's relationship to their environment and use of natural resources are considered.

2. Create Systematic Awareness of Power Structures

Western science and culture is widely implemented when compared to tikanga Māori in New Zealand. Pākehā always research Māori law and values to see why they think the way they do, but they themselves are never assessed on their own decisions. This creates and perpetuates an inherent power structure of one side constantly questioning the other and rarely allows them to have increased power or voice in resource management. The promotion of shared spaces, open discussions, acknowledgements of country, and other measures in governance can help to create awareness of social and cultural dynamics in contemporary life. Further awareness of this existing control structure provides increased opportunity for the empowerment of Māori ideals.

3. Foster Equal Voice and Authority into Membership Systems

As in power structures, tikanga Māori is often disregarded due to lack of Māori authority or voice in decision-making. Political and governance assemblies are primarily held in mostly Pākehā spaces where tikanga is not as well represented. Māori are 50-50 partners in the Treaty of Waitangi, but when it comes to representation in government, this balance does not exist, which often leads to an imbalance in power and authority. Holding formal meetings at a marae or in Māori spaces (or shared spaces) could help provide balance when it comes to decision-making, offering increased perspectives and voices even within the Māori community. Associating and ensuring not only membership, but equal voice and authority in said membership is critical to equality in decision-making and governance.

4. Promote Locally Driven Solutions

Our results highlighted and pointed to the importance of local iwi-based governance of natural resources in working towards restoring biological heritage. Our interviewees and research impressed upon us the importance of an iwi's local environment and natural resource, and the interconnected nature of the environment and Māori culture. Māori sense of place and intimate knowledge of their surroundings make them best suited to manage their local resources. This combined with the local nature of tikanga and mātauranga, varying between iwi, means that strict national based governance models are ill suited for applying Māori knowledge towards bioheritage. Success in community-based models and widespread community involvement also supports the notion of a local approach to the co-governance of natural resources in support of biological heritage. The [Waikato River Authority](#), the governing body mentioned in our Waikato River Case study incorporates this local approach, having strict representation from regional iwi, allowing them to properly apply their specific expertise and familiarity with their local environment in governance.

5. Emphasize Co-Governance Principles Grounded in Legislation

Co-governance models founded upon or backed by legislation have more authority to enforce policy, and are better suited to stand the test of time. Legislation based models

allow for authorities to be held accountable, specifically in relation to the Treaty of Waitangi. While flexibility is also important in environmental management to account for changing political climates and generational demographics, a rigid foundation of principles and relationships established in legislation allows for longevity and security in a governance framework. The increased authority provided by strong legislation is directly seen in the [East Otago Taiāpure](#) governance model, with strict enforced regulations carrying consequences with them, deterring harmful actions towards the environment.

Implement Outcome Monitoring and Knowledge Assessment

To assess the success of these recommendations, there requires a system in place to evaluate the area's environmental well-being and the effectiveness of the model as a whole. With a two-eyed seeing approach to the foundation of the system, having tikanga Māori and western science work together to measure the success of the model can help satisfy both sides. In the [Kaipara Harbour](#) case study, Māori are able to assess the outcomes to see if they meet certain expectations on their terms, and western science can do the same. Monitoring not only allows for the review of goals and targets, but it allows for partners and the wider community to regulate and review social and biological heritage outcomes.

5.2: Conclusion

The governance and management of natural resources in New Zealand and across the globe provide an opportunity to develop a sustainable solution to achieve positive biodiversity and environmental outcomes. In Indigenous climates, there is a unique space for the sharing of power, guardianship, action, and worldviews in order to meet ecological goals and, in the process, provide an opportunity to foster and strengthen community relationships.

Our project highlights the growing urgency for sustainability initiatives on a local, national, and global scale, in line with [United Nation Sustainable Development Goals 14 - Life Below Water](#) and [15 - Life on Land](#) and their emphasis on the opportunity to incorporate climate initiatives, conservation, and halting the loss of biodiversity and bioheritage (UN, 2021). Strong, inclusive, and equal bodies of governance and authority, in line with [Goal 16 - Peace, Justice, and Strong Institutions](#) will encourage effective and accountable institutions of power. Restoration of the biological heritage of New Zealand brings an opportunity to cultivate Indigenous relationships, promote shared leadership, and foster strong governance to rejuvenate the mana and mauri of the taonga of the Land of the Long White Cloud: Aotearoa.

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Appendices

Appendix A: Relevant Governance and Domains Frameworks

Figure 26

Manukau City Council Co-Governance with Māori

Infobox 3.A External Relations Objectives:

TREATY OF WAITANGI BUSINESS PLAN FOR MANUKAU CITY SERVICES 2001-2002

Objectives

MANUKAU LIBRARIES

- To develop and pilot a Māori language information literacy programme by 30 June 2002.
- To implement a Mana Whenua Marae Service Delivery plan by 30 June 2002.

COMMUNITY ADVOCACY FUNDING

- To provide a staff development programme which builds cultural harmony within the Community Advocacy & Funding Team by 30 June 2002.
- To increase the number of operational partnership relationships with Iwi by two by 30 June 2002

COMMUNITY ADVISORY SERVICES

- To develop relationships with Mana Whenua, Taurahere and Urban Māori throughout the City by 30 June 2002.
- To identify projects which enhance the capacity and sustainability of Māori organisations.
- To lead a project within a Treaty of Waitangi framework which identifies service benchmarks to minority ethnic communities.

MANUKAU MEMORIAL GARDENS

- To set up consultation with Tangata Whenua for the development of 2-3 acres of Māori land situated within Manukau Memorial Gardens.

LEISURE SERVICES

- Implement market research findings regarding preferences of Manukau City Māori population and develop programmes and services in line with identified needs: Establish one ongoing event and three new programmes by July 2002.

ENVIRONMENTAL SERVICES
Resource Consents and Compliance

- To develop a Service Contract with Iwi and consultation procedures for undertaking statutory obligations.²

FACILITIES AND PARKS MANAGEMENT
Manukau Parks

Tangata whenua will be consulted and/or have involvement with:

- Resource consents relating to development of culturally significant sites and management of selected parks of cultural interest (Otuataua, Hampton/Te Puke o Tara).

BUILDING MAINTENANCE AND CONSULTANCY

- Contract and Project Specifications to be reviewed for Treaty obligations by 30 June 2002.

PROPERTIES

- 30% of processes to be reviewed to incorporate Treaty obligations where appropriate by 30 June 2002.

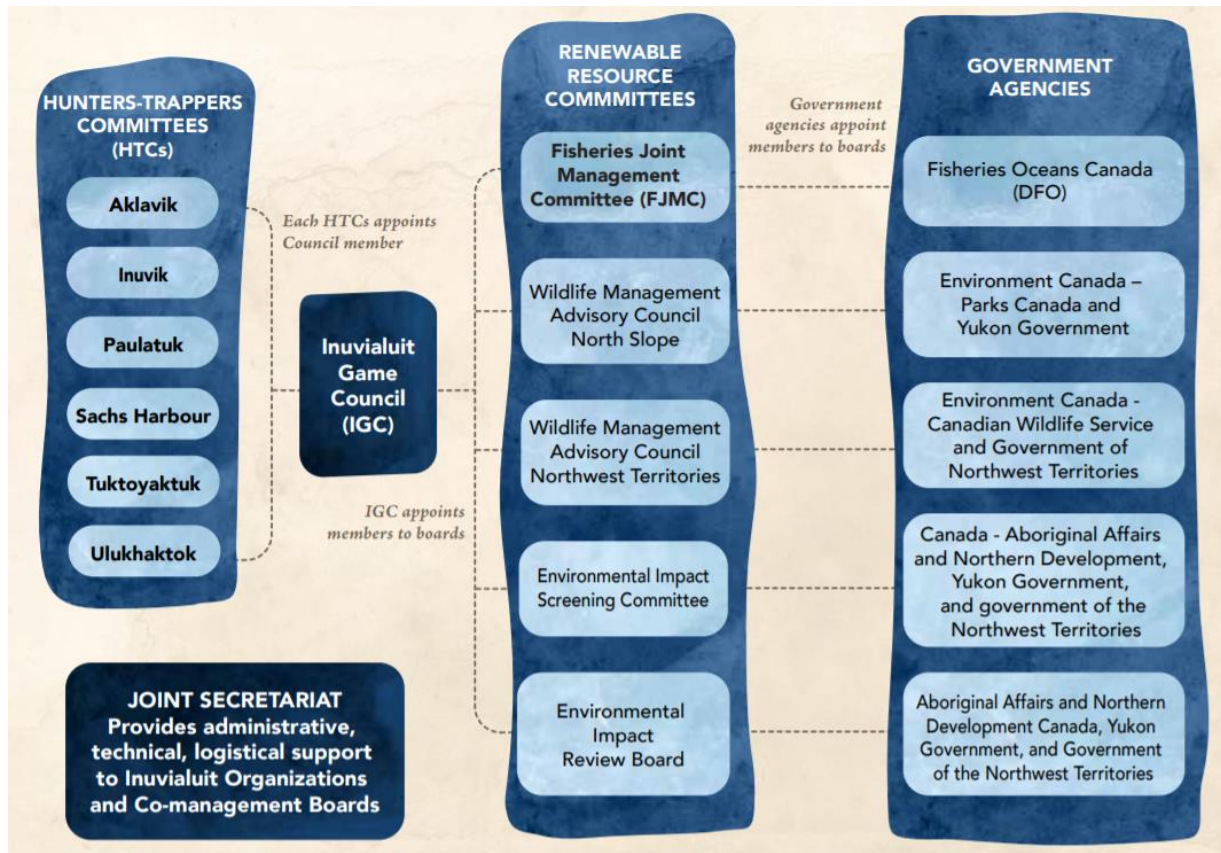
CITIZEN AND CUSTOMER SERVICES

- Completion of a map of items/features of special interest to Tangata whenua in the Manukau district.

Note. From James et al., 2002, ([Local Government Relationships with Māori report](#)).

Figure 27

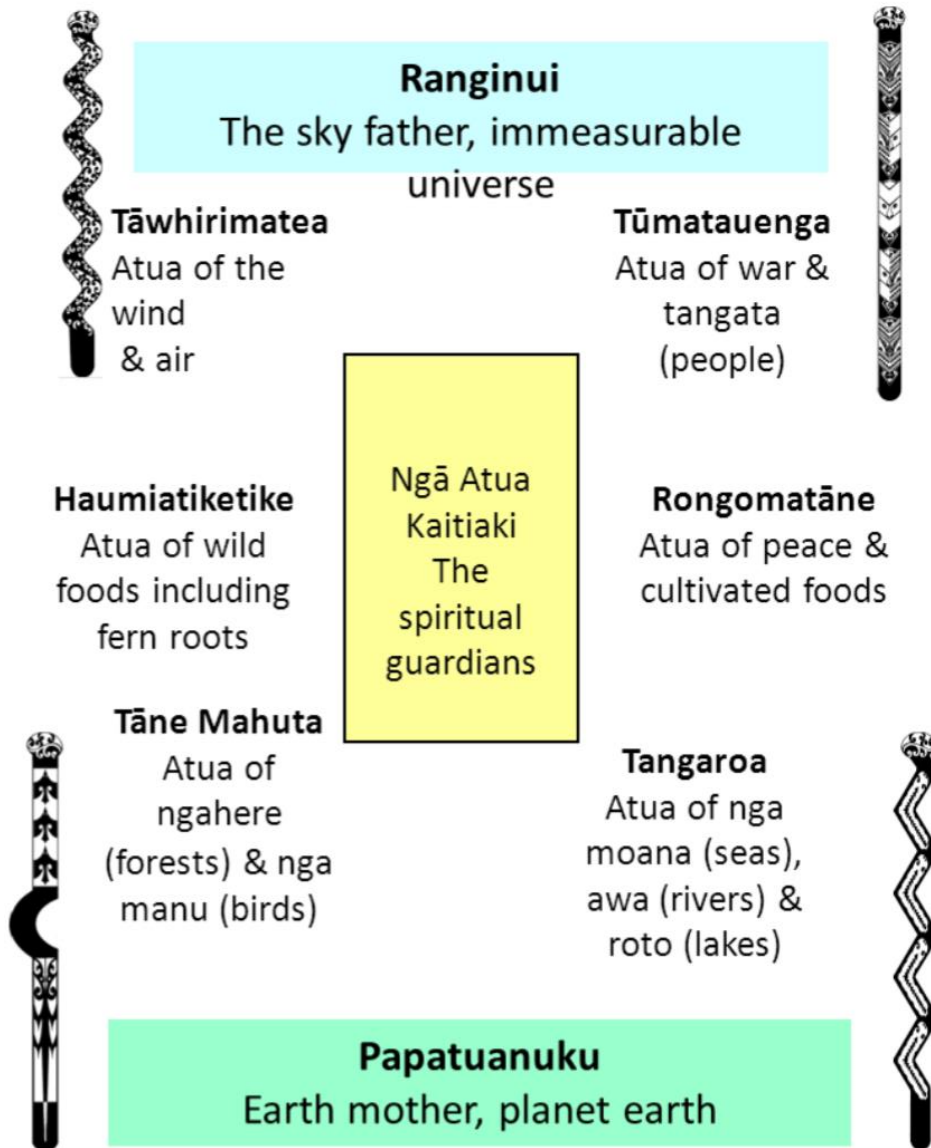
Inuvialuit Final Agreement (IFA) Visualization



Note. From Brower et al., 2020, (Inuit Circumpolar Council Alaska. 2020. [Food Sovereignty and Self-Governance: Inuit Role in Managing Arctic Marine Resources](#). Anchorage, AK).

Figure 28

Atua Domain Framework of Biological Factors



Note. From Atawere and Harmsworth, Landcare Research, [Ngā Aroturukitanga tika mō ngā Kaitiaki: Summary review of mātauranga Māori frameworks, approaches, and culturally appropriate monitoring tools for management of mahinga kai](#), (2014).

Appendix B: Interview Questions and Survey

B.1: Interview Questions

(to experts, ministry members, professors, etc.):

- Note that these questions are designed to inspire discussion with the respective interviewees within their unique areas of expertise.

1). [Introductory remarks, introduction to the team and the project. Request to record.]

2). Can you tell us a bit about yourself and your background in [respective field of work]?
What brought you to [respective study]?

3). As Americans, it can be hard for us to fully understand the importance of tikanga and local customs in local governance and community management. As Dr. Carwyn Jones described in his book *New Treaty, New Tradition*, tikanga is “the right or correct way of doing things within Māori society...it encompasses Māori law but also includes ritual, custom, and spiritual and socio-political dimensions that go well beyond the legal domain.” How influential is tikanga in your society and how has that dynamic changed since the Treaty of Waitangi’s creation and its respective settlements?

4). Emphasized by Dr. Carwyn Jones in his book *New Treaty, New Tradition*, is the “importance of viewing Treaty claims and settlement as merely part of a wider process of reconciliation and constitutional evolution” as well as the complex relationship between the Treaty of Waitangi and the Crown. What is the current status of the relationship between the Treaty of Waitangi and the Crown, and the direction it is headed in?

5). There are numerous issues in co-governance stemming from establishing post-settlement governance entities and how that relates to themes regarding identity, authority, rights, and resource management. In short, for you, what would the proper empowering and enhancement of tikanga and Māori values look like in government and policy?

6). How would you describe how the current system of natural resource management addresses tikanga and core Māori principles? How has this changed over time? What would you change if anything?

7). We plan to design a qualitative rubric to assess the governance of natural resources. If you had to make some ideal categories or strategies of 'governance factors' or traits what would they be and why? Why are they important? Examples of traits: accountability, transparency, inclusion, etc.

Conclusion). [Ask for additional contacts of colleagues or connections we may reach out to interview in assistance with our project. Thank the subject for their time and their interest in our project.]

B.2: Interview Guidelines for Additional Discussion

- Do you believe it [Treaty of Waitangi] is being respected and upheld in your region and community? Why or why not?
- What, if any, changes have you noticed in the recent governance of natural resources, and what have been the impacts of these changes?
- If you held infinite political power, what amendments would you make to the current governance of natural resources in your community? Why?
- How can any level of governance in New Zealand (from the Crown to local matters) better include or resource local perspectives and tikanga to better preserve Aotearoa's biological heritage?
- If you had ultimate power in your community or region, how would you work to protect the biological heritage in your community? How would you involve all partners (partners in the scenario would be provided to them if necessary)?
- [In regard to a local governance arrangement] How has [this particular governance model] affected you personally as a member of the community?

- [In regard to a local governance arrangement] Do you think that [this particular governance model] adequately represents, and cooperates with native peoples? What can be improved?
- [In regard to a local governance arrangement] What qualities of [this particular governance model] makes it unique? Why?
- [In regard to a local governance arrangement] If you were to rank the overall effectiveness of [this particular governance model] what factors would you take into account? Which are the strongest? Weakest? Why?

B.3: Survey Questions

(for those receiving [newsletters](#) or online posts via Facebook or Twitter from New Zealand's Biological Heritage National Science Challenge):

Introduction

Hello and thank you for taking the time to complete our survey!

We are a team of undergraduate students from Worcester Polytechnic Institute in the United States studying New Zealand's Biological Heritage. This research project is conducted in conjunction with SO7, Governance and Policy group and specifically explores governance models to discover strategies that best support efforts to restore biological heritage and natural resources.

Your responses to this survey will help to better understand local examples of governance models.

The survey should take less than 15 minutes. If you do not feel comfortable answering any questions, all questions are optional so you can skip them. We appreciate your time and help!

By clicking yes, you give consent to the publication or presentation of your data, which will not be used to identify you.

Yes

Demographics and Background Information

1). What is your age?

Under 18

18 - 24

25 - 34

35 - 44

45 - 54

55 - 64

65 - 74

75 - 84

85 or older

2). What is your ethnicity?

European Descent or Pākehā

Māori

Pacific Peoples

Asian

Middle Eastern/Latin American/African

Other _____

Prefer not to say

3). What city or town do you live in currently?

4). Are you involved in New Zealand's Biological Heritage Challenge? If so, what is your role?

Agree or Disagree and Listing

In order to better support New Zealand's biological heritage and natural resources, understanding diverse community perspectives can help support local knowledge to

better evaluate governance and management strategies.

The following questions will ask about your thoughts and experience with New Zealand's environmental decision-making.

5). Please select what best represents your position on New Zealand's approach to environmental governance.

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree	Don't know enough to answer
I am satisfied with the environmental health of my region and its native species.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My local and central government adequately addresses biodiversity decline and environmental health.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6). List some words or short summaries you would use to describe the state of New Zealand's natural flora and fauna. Other comments:

7). Please select what best represents your view on the inclusion of Māori knowledge and participation in your community and local governance arrangements.

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree	Don't know enough to answer
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

My community is accepting and inclusive of Māori culture and knowledge.

Māori perspectives are well represented in my local government's decision-making.

8). List some words or short summaries you would use to describe the inclusion of Māori perspectives in decision-making and governance of natural resources. Other comments:

Short Answer

Our project intends to recommend governance strategies and policy mechanisms that better support and restore New Zealand's biological heritage.

The following questions will ask you about your thoughts on existing governance mechanisms.

9). Do you think governance and policy processes are currently adaptive, fair, and effective in addressing New Zealand's biological heritage?

Yes (please explain your answer)

No (please explain your answer)

10). Please share recommendations for better directions or strategies your local or regional governance could take with regard to environmental and natural resource management.

11). What is the best or most effective co-governance arrangement that you are aware of, specifically as it relates to the management of natural resources? Why is this

arrangement successful?

12). We plan to design a qualitative rubric to assess the governance of natural resources in order to recommend strategies that better restore biological heritage.

Rank the following governance traits that you would define as important to you, 1 being most important and 9 being the least:

- Transparency and accountability
 - Inclusion of community partners
 - Public engagement
 - Environmental preservation and restoration
 - Strength of policy
 - Treaty of Waitangi compliance
 - Innovative policy
 - Community feedback system
 - Other recommendations
-

13). Why do you think those traits are important?

14). Do you have any additional comments or feedback?

Closing

Thank you for taking our survey! We appreciate your time. If you would like to provide any additional information relating to the survey, the Biological Heritage Challenge, or would be open to an interview, please contact us at: gr-BioHeritage@wpi.edu

To learn more about New Zealand's Biological Heritage Challenge, please visit bioheritage.nz

Appendix C: Expert Interview Transcripts

Below are the full transcripts of our interviews we conducted with experts across New Zealand in regards to the topics of our objectives. These are provided below with the intention of documenting their expert views on issues relating to New Zealand's biological heritage and adaptive governance and policy.

These interviews were voluntarily conducted over Zoom given the remote function of our project during the COVID-19 pandemic. The below responses of our interviewees are consensual in being recorded and drawn upon as part of our project's data collection process.

C.1: Interview 1: Dr. Carwyn Jones - February 10, 2021



Before researching Māori legal traditions and its intersects with state law at the Victoria University of Wellington, Dr. Carwyn Jones worked in the Māori Land Court and Waitangi Tribunal and also served as a negotiator for his iwi, Ngā Iwi me ngā Hapū o Te Rohe o Te Wairoa, in Treaty settlement processes. Jones' 2016 book, *New Treaty, New Tradition: Reconciling New Zealand and Māori Law*, provides a thorough historical, cultural, and social context for tikanga Māori and its place within the evolution of New Zealand's power and governance dynamics.

This interview revolved around tikanga-based governance and resource management and how it can be applied to better restore New Zealand's biological heritage.

Picture sourced from: Royal Society Te Apārangi


Tim Snow: We wanted to ask you a little bit about tikanga and local customs and Māori customs. So as Americans, it can be hard for us to fully understand the importance of tikanga and local customs in local governance and community management. As you describe in your book tikanga is “the right or correct way of doing things within Māori society...it encompasses Māori law but also includes ritual, custom, and spiritual [...] dimensions that go well beyond the legal domain (Jones, 2016).” **How influential, exactly, is tikanga in your society and how has that dynamic changed since the Treaty's [of Waitangi] establishment and its respective settlements over the years?**

Carwyn Jones: Annie Mikaere talks about tikanga as being the first law of Aotearoa, and so I think it's quite helpful to think of that as kind of the legal system pre-European contact. And indeed, in some of the Waitangi Tribunal claims, for example, there was an inquiry which was dealing with resource management and environmental law and policy, and the claim (and generally the Tribunal) talked about the idea of tikanga as, in the Māori world, having set that environmental law and policy or incorporated it.

After the assertion of British sovereignty and the processes of colonization and the imposition of colonial law, the state legal system has kind of taken over from tikanga; and so, although you would find, in some areas of life and some activities, you'd still find tikanga as kind of the guiding law and guiding legal system. So for example, we have the marae as the center of the community and there's usually a meetinghouse and so forth, and when visitors are welcomed onto the marae there's a particular process called the pōwhiri (invitation, rituals of encounter) which you go through and it's sort of setting up and framing that encounter. And that's all still a very Māori space governed by tikanga Māori, and that's quite a common space, for example we have a marae here at the University [Victoria University of Wellington] and when we welcome visitors onto the marae, that's all governed by tikanga Māori.

I guess one of the things that's the way I'd probably describe the process of colonization is that tikanga is gone from being the body of law that governed all areas of human activity to really reducing to apply either in particular spaces like in the marae or you can still see the way in which Māori communities or Māori events happen as well. So whether it's things like the protocols you would have just if you're having a meeting, you might open with a karakia or a prayer and might close with that, it might be key principles of tikanga which really do drive a lot of the way in which Māori interact.

To give you an example, I think there's a really strong principle of tikanga which you would describe as manaakitanga which is about sort of nurturing and caring for others. And you can see that principle operating a lot in the way in which Māori events are held or many Māori would interact. And sometimes you might look at think, 'oh that's sort of just a nice way to behave,' but actually if you come back to thinking about the system of tikanga, that's understood not just as a kind of a nice way of interacting but



there's a real obligation - a kind of hard legal obligation - to ensure, if you're welcoming people onto your marae, then you have a real obligation to ensure that they are looked after and cared for and so on. So you can see these principles operating, you might just see them in the background sometimes, but I think you can see them there still.

And I think that's really important that tikanga is still a living system and might have kind of reduced in its sphere of influence, but hasn't died out or hasn't disappeared. There's a Canadian Indigenous legal scholar, probably not too far from where you are, an Anishinaabe scholar called John Borrows. And he was talking about a particular river in Toronto which used to be a full river, but has been sort of built up over the top of and is now just a trickle of a stream, but every now and again when there's a lot of rain the river sort of floods and rises up and sort of makes its presence felt again, and so he compares that to Indigenous law. He said in settler states, it might've been built up over the top of, but it hasn't completely vanished and you sometimes see it coming through and filling in the gaps, and certainly in our New Zealand legal system, increasingly seeing the ways in which tikanga is being drawn on as a source of law to help to fill in some of the gaps.

We got a case which is going through our Supreme Court which involved a person who had been convicted of criminal offenses. He had appealed and had leave to have an appeal before the Supreme Court but he died before that appeal could take place and the question that then came before the Court was, 'should the appeal continue, given that the appellant had died?' And kind of the usual common law assumption would be that the appeal would stop, but a couple of the judges in the Supreme Court asked at the hearing, they put it to the lawyers and said, 'well, does tikanga Māori have anything different to say about that?' And the lawyers weren't ready to make some missions on that at the time, but the Supreme Court said, 'well, go away and figure out what you want to tell us about this, and then we'll come back again and hear you on that matter.' And so they convened a group of tikanga experts and listened to both parties and effectively said, 'you know here's the issue, how would this be dealt with in a tikanga Māori context?' And these tikanga experts came back with a statement of tikanga that they took back to the Court, and they referred to some ideas about the importance of mana so this idea of a kind of personal reputation and authority; just because someone was dead, doesn't mean their

mana was not still important. That's not a particularly Māori way of thinking about it, I think many people would think, 'well, just because someone died, it doesn't mean their reputation isn't still important' and it may well be very important for their family as well, but the common law had kind of shifted away from the idea for its own largely administrative reasons. So in some ways, tikanga is helping to adjust the common law assumptions around that. And the Supreme Court has allowed this appeal to go ahead largely based on the drawing on these ideas from tikanga has helped them to shape New Zealand's law.

Colin Reynolds: So another question going back to your book, you talked about the relationship between the Treaty of Waitangi and the Crown and you kind of described the Treaty claims and settlements as a “constitutional evolution” (Jones, 2016). We were hoping to learn more about what the current state of that relationship between the Crown and the Treaty and kind of what direction it's been heading in.

Carwyn Jones: So the Treaty settlement process has I think led to some really interesting developments and so there's been claims to the Waitangi Tribunal and then since the mid-1990s really there's been a sort of systematic process for settling historical claims and so the Crown engages in negotiations with claimants to work towards a settlement redress package and those settlement packages there's usually some kind of financial or commercial component to it and sometimes that's just the transfer of cash or properties that have a commercial value. The government is careful not to call it compensation because it's only a small percentage of the value of land that was taken in breach of the Treaty, but it's kind of a recognition that there has been economic loss.

One other part of the settlement package is usually a historical account and acknowledgement of Treaty breach and an apology from the government for those breaches. And then there's what's called a cultural redress package, and so this is, rather than addressing commercial or economic needs, it's intended to address cultural needs. So a lot of that is expressed in terms of co-management or co-governance, joint governance arrangements, particularly in relation to maybe specific sites or natural resources. And there's been quite a lot of innovative work done in that space, and so

we've seen some settlements where, for example, the Whanganui River is one where as part of the settlement the government through legislation recognized that that river had its own legal personality and alongside of that agreed to a number of values which may need to be provided for by anyone who's involved in making decisions about the river as well. And some of those kind of co-governance arrangements do start to have a constitutional gloss at least, in the sense of they do start to change who starts to make decisions, what are the things that get taken into account in decision-making, what are the mechanisms for making or challenging those decisions, and to some extent there are real questions about whose law is going to have a say or have sway in a lot of this as well. So they do start to shape that relationship between Māori and the government in a different kind of way, at least in relation to specific iwi and communities.

We've got a case, the hearing's going on at the moment in Auckland, which is all to do with the settlement context and it's one iwi in Auckland who has a settlement challenging the government's decision to offer some other land in Auckland to another group in a settlement. And part of what their arguing is through the settlement they have with the government, the government has signed up to acting in a particular way to acknowledging the authority they hold as the traditional occupiers of that land, and using the government law to actually say, 'well, actually there's a whole lot of things that you now need to either take into account or you need to consult with us or, in some instances, you may need to get our consent before offer this land in Auckland to another iwi as part of the settlement.' And so again the settlement has shifted that relationship between them and the Crown and changed the kind of things that need to be taken into account when the Crown is making those decisions.

Joe Coutcher: So also in your book, you explored questions stemming from establishing post-settlement governance entities and how that relates to issues regarding identity, authority, rights, and resource management. In short, for you, **what would the proper empowering and enhancement of tikanga and Māori values look like in a government and policy?**

Carwyn Jones: When there are settlements, there are these post settlement government entities that are established, and they become a kind of very visible sort of face of the tribe and kind of key tribal infrastructure and actually the work that's part of the Harvard project on indian economic development sort of talks a lot about some of the things that make statistical tribal governance. And one of the things they talk about is an idea of cultural match and the keyhole to sort of point out that when they talk about cultural match, they don't mean that your governance body needs to look exactly like ur government body did in the 19th century or whenever, but that should reflect the kind of key values the community has and the key processes the community might use for things like determining membership or resolving disputes or any of those kinds of things.

And so one of the things that you see, a lot for these post-settlement governance entities trying to build in, for example, membership is really important in these contexts because that determines who's entitled to benefit from the settlement. So you often see these post-settlement governance entities and their own constitutions will have mechanisms for determining who's entitled to be a member, if there are any disputes about whether a particular person's entitled to be a member or not, what's the mechanism for resolving that. And you quite often see an attempt to ensure the people who have the key knowledge both about the community, in terms of the genealogy of the community to see who might be entitled to be a member in that sense (and that they're involved in the decision-making), but also people who have expertise around tikanga-based forms of dispute resolution as well.


So sometimes in these governance entities there's often quite a lot of flexibility left to those people who have that particular expertise to design those processes, and there's one example that has had mixed results (this is not in terms of membership disputes, but in terms of a collective settlement where there were many different iwi involved). In the central North Island there's a large forest and there were several different iwi who had interest in that forest and there was a settlement in relation to that forest which went to the collective, but then there was a process for determining 'OK, which part of the forest does each iwi have interest in?', and they were going to then be allocating that land individually. And they have set out in their legislation this process which they describe as being a tikanga-based dispute resolution process, and there are some interesting factors

in there. So they talk about 'well you know, how we're going to determine who has rights to land.. well, we'll look at the kind of the tikanga-based things that we would look at.. So we'll look at the sort of occupation of the land, we'll look at things like whether the histories and stories of communities are referred to particular parts of that land, we'll look at the naming of that land..' All those kinds of things which would be kind of taken into account in a tikanga-based context. And they also said, 'well, if there's some disagreement, we'll have some initial negotiations that will be undertaken by people who have the authority to speak on behalf of their communities,' so the negotiations won't be undertaken by lawyers, they'll be undertaken by community leaders again kind of reflecting the tikanga idea about who ought to be involved in those discussions and who has the authority to speak for their community and bring their community along with the decisions that they agree to.

So there are those kind of factors that you might see and I think for me it would come back to kind of thinking about those key principles of tikanga Māori you know, 'how do you ensure that there's a sort of focus on relationships within your governance structure? How do you make those incentives? What do you do to ensure that there's a kind of striving for balance and reciprocity? How do you recognize mana? How do you take account of a kind of spiritual dimension and recognize the way in which your governance entity operates?' And there'll be kind of different answers from different communities about how they do that, but you can see in many post-settlement governance entities trying to find ways of giving expression to those values in their constitution.

Colin Reynolds: So just from a meeting we had earlier today with Dr. Bargh, she was mentioning how you were a negotiator for your iwi. So based on that, we were wondering **what sort of specific challenges you faced and different mechanisms or different frameworks that you found to be effective in reaching your goals and getting more involved in resource management?**

Carwyn Jones: Some of the real challenges I found were some of the internal tensions that the settlement process creates. In some senses, yes, still lots of things were



frustrating about dealing with the government officials. But our own people were kind of all on the same page about what it was we were trying to achieve in those negotiations. The difficult part came internally when we're thinking about questions around how do we take what's been negotiated as a collective settlement, and reflect that back through a community where there are kind of different, particular areas of interest.

Within our community, we had these seven different clusters that would come together for the negotiation and each of those seven different clusters have particular connections with a particular part of our territory. So how do we reflect the fact that, for example, in one part of that territory the government has had a state forest which is now highly commercially valuable, whereas another part of our territory the government has done nothing of any value but just owns some land? And how do we sort of manage the sort of equity and fairness across the community, reflecting the kind of traditional links that people have, but also try to think about the connections we have as a community as a whole and how to manage that?

So one of the challenges really too was that the government didn't really own (apart from the forest) much of any commercial value within our territory. They had certainly nothing that was available for the settlement, so most of the government's own property was either Department of Conservation land, so not used for commercial purposes and wouldn't be, if it was transferred back, would cost us more in terms of peace management and control and those kinds of things and certainly wouldn't bring in any income. Or it was government sites that were still being used by government agencies and were not being offered as part of the settlement. Financially, much of the land that we would've liked to have had returned was no longer in government hands but in private hands, and that's excluded completely from the settlement.

So that was one of the real frustrations for us, was that many people in our community would've gone into the settlement thinking 'well, we would like to see a return of our traditional land back into our ownership,' but actually there's very little of that could've been used in the settlement. So we had to look for other kinds of mechanisms and that's partly why these kind of relationships around co-government or having input into management of national resources became quite a significant focus. Because there wasn't so much land we could own, but we could have input into what the central or local

government was doing in terms of resource management, what they were agreeing to in terms of the sort of projects that they were contenting to and trying to ensure that we were participating in those discussions and those conversations. So a kind of key part of our settlement was setting up these relationships particularly with local government for us, which became really important and in figuring out how to have that input.

So there's a lot that focuses on environmental governance and resource management in our settlement. There's also a kind of key part of it where we wanted to engage on kind of social and economic development issues and try and work with government to get a kind of joint partnership governance body that would focus on the Wairoa region on our traditional territory and focus on the particular issues around housing, employment, and those kinds of things. And again, for us to be having input into what we think is important, how we might participate in ways of addressing some of those issues too.

Colin Reynolds: To follow up on that, you were mentioning how some of the land that you would've wanted back the ownership of wasn't available. **So the co-governance was kind of a way to meet in the middle or another thing they could offer you instead of saying like 'you guys can be involved in managing this, but we can't actually give you the land?'**

Carywn Jones: There's been a real feature of the Treaty settlements is that, part of the reason why there's been a lot of innovation around the environmental governance stuff is because, you know, often the government doesn't have the land to return. Or that sometimes you're talking about - this wasn't the case for us - in some areas the land you are seeking to be returned, for example if it was land in central Auckland, that land is now highly valuable and would be kind of outside the scope of the proportional value of the settlement. So sometimes it's about trying to find, for government - to be frank - kind of a low cost way of trying to address some of these issues. But it has meant that there has been some innovation in this space and it has led to, for us, a lot of the land which was Department of Conservation land, we didn't feel we needed to necessarily own it, but there were some areas where, for example, there was a cave system where we wanted

to stop people going to cause they were sacred sites. And so, we didn't need to own those caves, but we did want to ensure that people weren't going there. Or oftentimes it's about, if it's Department of Conservation, then it's ensuring we have access to a particular site. And again, we don't necessarily need to own it, but we might want to make sure we have access to it. So some of those kinds of things can be addressed, but it is often also, as you say, kind of a second best option or compromised option sometimes.

Tim Snow: Onto this discussion of co-governance and how we can try and find a method to make it most effective, as you know we are working with Maria [Bargh] on adaptive governance and policy as it relates to the National Science Challenges, which we have recently learned that you are a new co-lead on with her. So we wanted to hear your perspectives on some outcomes we were planning on getting out of this project.

Now, we've defined our main goal of this project to be to evaluate both Māori, Crown, and local legislative models to investigate strategies that better support the restoration of biological heritage in New Zealand. So as one of these outcomes we were planning on designing a qualitative rubric... to assess the governance of natural resources. In our research, we were planning on creating a series of categories and subsets in which a governance model or system or mechanism of resource management can be evaluated.

For you, in your experience with Māori Land Court and with all your research at the University [Victoria University of Wellington], **if you had to propose some ideal categories to evaluate a governance model or factors of governance, what would they be?**

Some examples: So we've set out with like - I think we started with nine - so one, for example, was whether a governance system has a strong sense of preservation; so the model's endangerment of (or damage to) assets of partners or specifically the environment. For us, we've defined the partners in our project to be Māori, Pākehā, and the environment itself. So we focused on preservation, whakahou or restoration, how strong the model is - in a sense of strength of policy (because if the policy isn't strong enough, it can't be enforced as well).

Carwyn Jones: I tend to think around an idea of well-being - in terms of the health of the environment but also of communities that engage with or are apart of the environment. I think, maybe alongside that, it is also important to focus on - I don't know if sustainability is quite the right word, cause often you get concerned about how often 'sustainable development' language has been used to say 'well, what's the most development we can get away with?'

Maybe it's connected to this restoration idea, so maybe it's something more about revitalization. Is this a model which is ensuring that there is sustainability, but actually with a more positive perspective in that there's kind of a strengthening of the environment as well? I think too there's an important element of thinking about kind of a transparency and accountability. And that's partly influenced by one of the things the Waitangi Tribunal has commented on and about current resource management law, is that it's had in it quite a lot of potential for co-governance, but it's never really lived up to that potential and never really realized that potential.

Because, you know, if a local council decided they wanted to delegate authority and decision-making around something and that never really happened... the first instance of it has happened just recently after 30 years of the Resource Management Act and part of the issue that was identified there was that there was no mechanism for iwi to be proactive and say 'well, here's what we'd like to have happen' and then a responsibility for the council to respond and either say 'yes we're gonna agree to that' or 'no we're gonna disagree, but here are the reasons why.' And so long there are reasons why then you may want to challenge those, but if there's no requirement to give reasons or to even respond, then it's really hard to make those things effective. So having systems of accountability and transparency built into the models I think are really important.

C.2: Interview 2: Thomas (Tame) Malcolm - February 16, 2021



Thomas (Tame) Malcolm comes from a Māori family where he grew up hunting and fishing with his father. From a young age, Malcolm always wanted to work with nature; from this interest, Malcolm pursued study in biology and worked intensively with the Department of Conservation and pest control in New Zealand. Malcolm created the group [Puna Consultants](#) to work more closely in working with communities in completing environmental contracts aimed at restoring Aotearoa's bioheritage. Malcolm is a member of the New Zealand's Biological Heritage Challenge Strategic Leadership Group.

This interview revolved around resource management and Māori co-governance, and how mātauranga and tikanga Māori can be applied to governance structures to better restore New Zealand's biological heritage.

Picture sourced from: Te Karere

Joe Coutcher: Could you tell us a little about yourself, your background at Puna Consultants, and what brought you to working in biosecurity and Māori engagement?

Thomas Malcolm: I was brought up in a Māori home, so my dad is Māori, and brought up hunting, fishing, and whatnot - loved it. I went to uni [Waikato University], and all I wanted to do was work in the forest, that's all I ever wanted to do. So I went to uni to study biology, on summer holidays I would work for Department of Conservation doing tracking and pest control. Then I worked for local government, central government, some research entities all around pest management. I started doing contracts on the side in 2013, just pest control contracts, so trapping for farmers, helping iwi do deer control and whatnot. About 4-5 years ago, I decided to startup an official company, so I left my job at the council managing pest control programs and I have been doing it ever since. Most of my work is around either research, probably a $\frac{1}{3}$ research, $\frac{1}{3}$ engagement, and $\frac{1}{3}$ physical work out in the field, but depends on the week and the day.

Tim Snow: You mentioned that you branched off and started this endeavor, were you involved in creating this group, Puna Consultants?

Thomas Malcolm: Yes, so I left the council, started up, and had a few contracts ready to go and I needed more and more help. My wife does contract work for me, my dad, sister-in-law, cousin, niece.. yeah it is a family affair.

Colin Reynolds: Kind of branching off of that with your work in consulting and the contracts you were talking about, when you go into a community to help or with the contract, **what type of governance arrangements are usually in place and what type of general environmental systems are in place? And how does this lead to specific issues that you specifically tackle?**

Thomas Malcolm: Really good question, and there is no easy answer. Just about every community or entity I work with, they have a range of systems in place. So some then have a full-on governance structure with management and an operations arm. Some just have one or two people that drive everything, so it depends on where and who I'm talking to, it's just a range of options. And therein lies the issue, there's a lot of people who are unaware of the pest control system or processes we have here in New Zealand. So a lot of my work is actually just giving out free information of where they can find free information on how to achieve what they want to achieve. For example, the most common question I have is 'hey, can you come do some pest control in our area?' And I'm like 'cool, why do you want to do it?' and they haven't even answered that question. They say, oh cause it seems to be what we do in New Zealand or we know they are pests or they're annoying, so my first question always is, 'how about we figure out why they are pests and then we'll go from there. And to do that there is a lot of funding out there from the Department of Conservation, local council, research funds, that they can tap into without spending any dollars.

Tim Snow: Based off of that and just another question regarding pest control and more of the governance side or aspects of that, so based off your experience and perspectives and working with Puna Consultants and investing in Māori communities, **how do you think Māori values and concepts like tikanga are currently being applied and**

represented in current governance models and policy substance that exists currently in-country and how has that changed over the course of your experience in research and working in these groups?

Thomas Malcolm: Really good questions, these are all real good. So if you go back about 10 years ago it was a very recent approach to environmental management, so they have a governance structure that resembles your typical conservation board or local council. And a result, they also followed western science policies but over the last 10 years, we've seen a huge change in governance and policy. Things like giving [Whanganui River](#) and [Te Urewera Forest](#) personhood, and conversations elsewhere to be had that are more appropriate for different iwis. So some tribes, while they may not recognize their significant landscape as a person itself, but they might recognize it as an ancestor. So all of a sudden they're now thinking 'ooh, rather than treating this like an environment, let's treat it like a graveyard or a monument to our ancestor.' Other people are going back to what Whanganui did, 'ooh, this landscape, let's treat it like a person.' And so that philosophy had led onto different ways of governance or different models of governance. So rather than having a chair and a secretary and a board, they have multiple committees that represent different aspects of the landscape or people that represent the whole thing. And that person's job is to go around and speak with the landscape rather than for the landscape.

Joe Coutcher: Another question that we have: based off Māori representation in these communities, for you, **what would the proper empowering and enhancement of tikanga and Māori values look like in a governance policy?**

Thomas Malcolm: It should be at the forefront. If I was to take everything right back, that Māori lead the conversation or lead the governance, they develop all the policies with tikanga and kawa (Māori protocol or etiquette) in mind, te Māori protocols at the forefront, so that would be your strategy and policy. And any planning or document under that for a later on date, that's when you bring in the technical experts that are required or the western models that are required.

Colin Reynolds: Another question based on your experience consulting and with contracts you've been talking about: **Could you expand upon your experience in working kind of both sides with the Crown and local governments, but also working for iwis in this co-governance and different mechanisms or different strategies that you have seen to be effective or not effective in these different relationships?**

Thomas Malcolm: In terms of effectiveness, everything has to be bespoke and developed to get it right from the start. So the biggest frustration is governments see a problem and go to Māori saying 'here's the solution,' and that's not really working anymore. The next step, which is kind of more palatable, is government go to Māori and say, 'hey, here's the problem, let's develop a solution together.' The best way forward I see, and it's slowly getting there, is Māori identify the problem at the place, then the government coming and saying 'ok, what do you need to help address that problem?' And that moves away from just marketing to genuine engagement.

Colin Reynolds: **So rather than just shifting from the government going to Māori, and being like, 'this is the problem, how do we fix it?' it's more Māori actually recognizing and bringing up the problems, so that's kind of switching the roles or reversing the direction of that relationship?**

Thomas Malcolm: Yeah, yeah. A lot of Māori communities live at place and have a really good connection with their environment, so they understand what the problems are. So it makes more sense for them to identify the problems and then for government to try to them in those problems, rather than government coming and saying 'hey, here's the problem, here's our solution,' because all of a sudden you'll have that Māori community as another problem cause they'll just pushback on it saying 'nah, not keen [on that].'

Colin Reynolds: Also, kind of branching off that, **are there any specific positive outcomes that you have seen from co-governance and the shifting relationship you talked about that came out of it specifically?**

Thomas Malcolm: Yeah, I'm not sure if you've seen issues around [1080](#), it's a vertebrate pest toxin that we use here and it's quite controversial. Let's talk about gene-editing. We've seen a lot of pushback on gene-editings in the early 2000s when there were genetically-modified organisms, when that takes change. So we're still getting pushback from Māori communities on that or Māori communities saying 'hell no,' but there are some that haven't been given the opportunity to explore it themselves. They've gone in search of solutions and come across gene-editing so now they're calling on government saying 'hey, we want to have our share of proper conversation or we want more information on this.' So to flip that whole paradigm on its head, rather than protests against possible solutions for an environmental problem, we're saying almost protests for an investigation of the solution, so again going back to what I was saying, giving Māori the opportunity to investigate the problem.

Tim Snow: A quick follow up on that: so you've emphasized the importance for Māori to be able to identify the problems and work more directly in, as you said, the forefront in developing these environmental policies and whatnot, **what are some of the challenges that you've experienced in trying to implement that strategy on the local level versus an obviously more challenging scale of central level of government?**

Thomas Malcom: Another good question. At a local level, that often relies on individuals. So, you have the regional manager or local manager that can just make the call there and then: 'ah sweet, ok, we'll flick you guys \$10,000 to investigate gene-editing to address that pest, and go for it,' and he just signs it off and gives it to the Māori community. So that works really well; so at a local level, relatively straightforward so long as you have the right person in place.

At a national level, super hard, and not for the reasons you think. It is more because it comes back to the individuals again. You have these bureaucrats that are very sensitive to their ambitions. So they don't want to make any career limiting moves, and the way to get to the top is to impress politicians and policymakers, and the way to do that is play it safe and just deliver simple outcomes consistently, rather than taking leaps

of faith and failing. So at the central government level, we see people that are so scared to make any moves that they don't make any moves at all or they'll make the same old same mistakes.

Tim Snow: So you would characterize this 'playing it safe strategy' to be more of the same where Pākehā or the general systems of power are coming to Māori and saying 'oh here's the problem?' Is that general what you would characterize it as?

Thomas Malcolm: Yeah, and it's because it goes to politicians. Their voting base is made up largely of non-Māori (Pākehā). So they're [non-Māori are] the ones calling out for the problem, saying 'here's the problem, here's the problem, etc.' and get all the way to government saying 'here's the problem, here's the problem, etc.' and push down on ministries and departments, and that's happened for years and years. Māori do make up 15% of the population, and even if we do talk with our feet or vote, it's often just castaway as a minority vote; but, not forgetting that we are 50% of the Treaty partner, so it's a whole different dynamic constitutionally. What we're seeing now is there are more and more people saying the right things, but still no action. So they'll say, 'oh yes, we'll give Māori communities some funding to investigate that problem,' but one, it comes with a lot of strings attached, and two, it is a media stunt. So they'll say to Māori communities, 'right ok, you guys go out and do it, we'll just want a photo-op with the politicians, our CE, or deputy director...' So yeah, frustration.

Colin Reynolds: Is there a disconnect between the Treaty being 50% Māori and 50% non-Māori and the actual government process where Māori don't necessarily make up that percentage [50%] of the population so it's hard to actually make the change in voting?

Thomas Malcom: Yeah, it is pretty hard. Especially cause there are Māori that don't have trust in the system. As well as making up 15% of the population, we have a lot of communities that don't vote or aren't engaged with politics. And then you've got these huge barriers with people saying 'who cares what Māori think or who cares about their

black magic or indigenous ways?’ So we’ve got these barriers in place, but it basically comes down to systematic racism as well. Let’s go right back, the Treaty should have been 50-50 right from the start and it promised different things in the different languages - the two different languages it was written in. But the Crown or the government has done a lot of things to swing it in favor of themselves. Some of the legislation back in the early days was around wiping out Māori knowledge, taking land off of them, this time of the year there’s a lot of anniversaries of where basically Māori populations were slaughtered to take their land. So you see, you have all of that building up, so when Māori communities do reach out to try to say something or engage in politics... ‘oh, just get over it,’ and so they get turned off and frustrated.

Tim Snow: Yeah, that sounds like quite a challenging dynamic, that’s unfortunate. As Americans it’s really hard for us to fully understand a lot of these issues as they come up in our research. Something that I try to think about is how our Constitution works and what you were saying before with the Treaty, and how in a perfect world it should be 50-50 and how that relates to our Constitution works in that it protects the minority from the tyranny of the majority. But again you see these injustices in certain ways, the government function, how policy is created, that could potentially harm these minority communities despite them making up 15-13% of the population, so it’s a challenging governance dynamic that this discussion is informing us about.

We have a kind of final question here about the overall outcomes of what we hope to get out of this project. So based on these talks we are having with experts such as yourself working in these groups, we are planning on designing a qualitative rubric to assess the governance of natural resources. We plan to do this on a strategy level, so we’re looking at the actual strategies that are put into place. So like the group you work with, Puna Consultants, where there are certain strategies that are put into place in order to manage pests that are in your country currently. And also, we want to look at it from an outcome level, and look at the actual, tangible outcomes that have a positive negative effect on New Zealand’s biological heritage. So from your perspective and experience in working with the Crown and local government, **if you had to make some ideal categories for governance strategies and factors, what do you think they would**

be? Would you have any suggestions for traits that might be more important than others? Whether that's including Māori more in policy decisions, whether that's the strength of policy? Some examples?

Thomas Malcolm: The first one would be Treaty - so the Inclusion of the Treaty principles. I would suggest Treaty and Māori values. So I've seen it with the Bioheritage National Science Challenge - their second tranche of funding and research programs. They're guided by values. That's been really good because they were left in Māori, rather than being translated, cause it was too hard to translate, but it also made all non-Māori guys to learn a little bit more about those values. The typical values like truth, communication, integrity, those things, but they were left in Māori and they encompassed a lot more in Māori. So, values would be one, values that are from te ara Māori (the Māori pathway) - from the Māori world. With a strategy, not only the impacts, but also how local it is, rather than generic strategies, I would be keen to see stuff that is more tailored towards the area it's talking about. Not sure if that is an effect that would be considered, but that's definitely what I look for. When it comes to environmental management, strategies are like toothbrushes, everyone's got one but no one wants to use anyone else's.

Colin Reynolds: Kind of like, you were talking about how the people that live in that area know the environment the best, so they should be the ones who manage it. **So going down to that local level, kind of on a case-by-case basis, right?**

Thomas Malcolm: Yeah, it depends on the strategy and the writer of said strategy. Yeah, sometimes it is better when you do have local communities influencing the impacts cause they're the ones that can monitor it, so I'll always look for that in a strategy as well.

Tim Snow: It goes back to what you were talking about with the central government being obviously more challenging to monitor these issues, because it's such a large entity and it's really hard to try to uniformly create a policy that addresses everyone at the same time in an equal way. So having a more localized system maybe more at the regional or council

level. Something that I think about is how to integrate the two, because something that we talked about with Carwyn Jones was the actual financial side of it and that there are certain funding and costs that are associated with these plans and whatnot. So you'd almost have to take into account some type of method in having the central government provide some type of funding or research to these local groups, being able to manage these resources at a localized level while also having the necessary funding and help from the people that 'have it.' **What are your thoughts on something like that?**

Thomas Malcolm: Yes and no.. There are some tribes that have settled their Treaty breaches, so they are managing millions and millions of dollars. The issue I see when it comes to my space is sometimes government push back on them and say, 'hey, now that you guys have money, why don't you address the environmental issues?' and that money was to address breaches of the Treaty and help their people. So you see a lot of iwi pushing back saying 'hey, don't get rid of your responsibilities to the environment just because we have money, you still have responsibility,' but what we are saying is 'we can take that money from your government and we can do it ourselves, we're more than capable of managing finances and getting outcomes, so we can do it.'

There are some that aren't in the position to do that, so it's definitely a case by case. But what I will say as well is I would love to see the Department of Conservation become a funding agent and a funding model and their metrics or KPIs (key-performance indicators) of success are around engaging people. So let's say they're doing a community fund for trapping pests. Rather than measuring the success on how many possums were killed or how many birds they saved, their measurements of success were how many people they had turning up to the volunteer day, how many full-time positions they have going on, and we're slowly seeing that now but that's probably where probably the greatest 'bang for buck' would be is to get more people engaged in this rather than same old.

Colin Reynolds: With the settlement, **does the government give this money for settlements based on previous grievances and then expects that money to go towards the problems they're facing now. So it's kind of the government settling**

previous problems then just being like, 'you guys deal with it now, we kind of did our part,' when it's just past problems? Is that sort of the dynamic?

Thomas Malcom: Yeah, so when 20 years ago when some people started settling, no sooner had they signed the deed of settlement, so 'yup, here's some of your land back - not everything we took from you... but heres some of it - and here's some money to say sorry for what we did, sorry for killing off your species that you guys valued (or killing your people in most cases). No sooner did they sign it then they had other ministries within the government turning up saying 'hey, now that you've got money, can you do that freshwater program that we're keen on doing or can you do that pest control we were talking about?' Our tribes, they had to look after everything, so there they were in government for themselves, so they had social needs and environmental needs and economic needs, but yeah, they shouldn't be there to address the needs of government.

C.3: Interview 3: Dr. Nicolas Lewis - February 17, 2021



Dr. Nicolas Lewis is an Associate Professor in the School of Environment at the University of Auckland, and has a PhD in Geography. Lewis comes from an extensive background in economics and has since applied that to investigating marine management and how it relates to classical economics. He is also a Challenge Leader in the [Sustainable Seas](#) National Science Challenge, focusing on a blue economy in New Zealand. His research centers around sustainable marine management and its economic implications.

This interview centered around how his experience in marine management could inform on governance models, his perspective on existing governance methods of research management, as well as his experience with the National Science Challenges.

Picture sourced from: The University of Auckland

[Interview transcript not included]

C.4: Interview 4: Dr. Vincent (Billy) van Uitregt - February 18, 2021



Dr. Vincent (Billy) van Uitregt was born and raised in Australia and from a young age had an affinity for animals leading to his studying and completion of a PhD in Evolutionary Ecology from the University of Queensland (AU). After completing his PhD, Dr. van Uitregt shifted from scientific study to working with Indigenous peoples in Australia and his current research interests lie in studying human environmental relations from an Indigenous perspective. He recently completed his MA in Indigenous Studies from the University of Otago.

This interview revolved around Indigenous perspectives, Māori-based governance and resource management, its outcomes, and how it can be applied to better restore New Zealand's biological heritage.

Picture sourced from: Victoria University of Wellington

Tim Snow: Can you tell us a little bit about yourself and your background in Ecology Indigenous Studies and what brought you to your research at the university [Victoria University of Wellington]?

Billy van Uitregt: So I am whakapapa to Whanganui here, which is my genealogical heritage. In terms of tribes or iwi as we call them, I whakapapa to [Ngā Rauru](#), [Te Ātihaunui-a-Pāpārangī](#), which is the [Whanganui River](#) crew and to [Ngāi Tūhoe](#). Coming to Aotearoa New Zealand from Australia, having been born there, it's a bit of a connection to my own sense of [tūrangawaewae](#) (literally "standing feet" or place to stand, areas for people to feel connected and empowered with regard to their home). That's me searching for my [Māoritanga](#) ("Māoriness," in a sense). So in a sense, I'm trying to connect with the spirit of my late mom - yeah, and to be honest that's the main reason why I'm here. In terms of what I study, I've always sort of had an affinity for animals. I wanted to be a vet when I was younger, much younger. I never had the grades, but I ended up - in my attempt to get into Veterinary Sciences - doing Zoology instead, and that was far better for me - you know being outside, less clinical environment is what I'm all about.

And so just followed that to the degree where I got a PhD at University of Queensland; I grew up around there. When I finished my PhD, I started working with First Nations, so firstly [Anindilyakwa](#) on Groote Eylandt in the Northern Territory (Australia). And that got me to shift in my thinking, so I felt the western universities and western epistemologies were really deficient as to what I could see in Indigenous peoples who live on country in a very traditional way and the way that they know their place. Me as an ecologist, I was incredibly deficient in comparison to them. I would probably die out in the country because it's very remote and sparse. Whereas they seem to have an inherent understanding of the ecology of the place as part of the ecology. Yeah, so that might be where I jumped out of science and into working with other Indigenous people in Australia and I ended up working with [Nunga whānau](#) down in Adelaide but working on the river Murray, which is 'Moorundi' for them. I continued that trajectory of working and thinking about our relationship with the planet in a different way, sort of from an Indigenous perspective. That's pretty much where my research interests lie. I think fortunately where my personal interests and research interests overlap. So whakapapa to Whanganui, which I'm sure you've heard of in some sense as that river that has legal personality. Yeah, so for me it's about connecting all of those dots, it's a bit of who I am, it's what I was born to do and I'm just doing it.

Joe Coutcher: With your background in indigenous studies, **which kind of relationships do you find the most effective between Māori and non-Māori for protecting the surrounding environment and New Zealand's biological heritage?**

Billy van Uitregt: I would say any of the ones I've seen work all that well, they work, but whether they work well is a complex question. I'm going to change that question up on you and point at the bits that I see that don't work very well. There's this inherent understanding that western epistemology is the dominant and the better. A lot of the time, even though people have these formal arrangements and agreement they're bringing us to come together and share this space, the authority is minimal for Māori, so you see that in resource consent processes. Continually the process, if they engage with hapū and iwi it's like they'd be lucky to and even if they do the authority that the consultation process holds in the decision-making process is pretty weak. I haven't seen anything really come out of that and the same is true for Australia. They have these hierarchy structures of power, and the power always sits with the government and the western institution to veto things. This happens on all levels from governments, universities and individual interactions. I feel it, I feel that lots of people engage with me on a very superficial level, always assuming they're helping me. It's an issue because I am seen as the Māori element as the project, but the whole project is Māori. I am not the add on, it is you.

I think that plays out a lot and is the biggest hurdle that we need to get over to actually have some voice and authority. I would say that it plays out around the world. Looking at the Arctic government and the indigenous voice in the Arctic council. They have a seat at the table, but they never have authority or voice and have no influence in the decisions made. This same issue is played out at all kinds of levels. Some of it is formalized in decision-making processes, but other parts of it are just parts of our culture to see the indigenous or the brown side of things as subordinate to the dominant.

Tim Snow: **So you would attribute that disparity and authority to more of a formalized structure problem that there's an inherent problem in how these mechanisms function, not necessarily membership, but what do you think are**

some of the factors that go into this disparity as you say the greatest issue and some of these issues?

Billy van Uitregt: I think it's formalized in a lot of ways, but it is just part of our culture as well. The problem is that people can't see or the majority can't see it because they don't get to feel the subordination they are imposing on the other. While it's formalized, it's because the hegemonic or dominant group don't feel it or see it because they're not subjected to that subordination.

Colin Reynolds: We're looking at different co-governance methods for management of natural resources and the environment, and the Māori role in that and how effective these governance strategies are. **Are you familiar with any specific governance models or systems in place and can you describe them?**

Billy van Uitregt: I would say they all suffer from that same problem. I know there's one model that's called the '[Waka-Taurua](#)' (or double-canoe method, wherein kaitiakitanga and EBM are married in a management system). That's probably the best deconstruction or articulation of that problem because normally when we talk about indigenous knowledge it's about bringing indigenous knowledges and points of view into hegemonic structures and that inherently lends to picking and choosing the bits that fit within those structure, while leaving behind the all the stuff that's incongruent with them. So that Waka-Taurua model is really good and that thinking is starting to be reflected on all different levels. There's another paper that was published last year in September or October and that puts it in a very western sort of framework so this Waka-Taurua I guess is some Māori conceptualization of that same issue and not weaving ingenious knowledges into western science or powers in governance, it's about letting it stand alone and building structures that sit between them to negotiate the weaving or integration. So it's just being mindful by bringing the minority world views or peoples in that you can subsume them and actually start predated them.

Tim Snow: So you mentioned you being from a group in iwi that's close to the Whanganui River, the one with personhood. **Do you believe that the discussion and policymaking behind combating climate change and bioheritage is even, and what ways can it change and shift the scale in this authority discussion we're talking about?**

Billy van Uitregt: I would say it's definitely not even, from my perspective it's a very extractive process even when governments or universities or researchers want to engage with indigenous epistemologies. It's inherently a power structured conversation and it's extractive. I feel that on a very personal level with my relationships the university and my colleagues. They would probably because I have this Whanganui whakapapa they want me in cause they would see that as a commodity I can bring to their university and their courses, so that's the issue. I think to move away from it, a lot of people call it decolonizing, I don't really know what that means. I agree it's not about Indigenous people developing themselves or becoming better scientists or governance people, it's about the hegemonic structures and really reflecting on themselves and their implications of world views. In my mind, it's this western, neoliberal thinking that creates this hierarchical structure of which we're all meant to climb and get as far to the top as possible and inherently to get to the top means we've got to push other people underneath us.

I feel that happening all the time, being the brown person in the crew - or the only one a lot of the time - so I'm seen as the subordinate and they push me down and extract from me. So it's really about government, universities, and people as individuals reflecting on their own cultural values and how to flatten the hierarchy a little bit. It's a societal thing, it's capitalism sort of thing. I'm giving a talk at uni next week and I'm just trying to highlight those power structures everyone in the school will come to me and ask how do I engage in Māori? Or what's mātauranga Māori? That is such a hard question to answer. Like how am I supposed to engage in mātauranga Pākehā? What's mātauranga Pākehā? I'm just trying to turn the power structures around to make them visible and say this is how I feel in this interaction. I'm going to delve into the depths of Māori epistemology and you just get to do your science without ever reflecting on what your science is, the philosophical commitments that come along with your science and practice, and the peoples that you subordinate by doing it.

Tim Snow: Do you want to articulate more on how you suggested mātauranga Māori shouldn't just inform upon western thinking?

Billy van Uitregt: You want them to sit side by side. Make sure both sides are in their own entity, and by looking at both of them you can see the benefits and deficiencies within each, but you get a three-dimensional perspective or understanding of the thing you're looking at. So it's about sitting them side by side with parity and not just using the bits of mātauranga Māori to plug into the western world view that fit nicely, but rather challenging your western world view using mātauranga Māori. That's the important part, you've actually got to start reflecting on the deficiencies or limitations of your world views and epistemologies. I think it's the philosophical commitments that come along, so if you see the world in a certain way you can only see parts of it or understand it to a certain degree. By looking at it through someone else's eyes or a different world view, you can really get an appreciation of the things you weren't seeing. In that it's good because on the things that were shared across the two world views, you get greater confidence in what your saying is true. But then those bits that are incongruent, then you can start to question.

Colin Reynolds: In your opinion, what would be the best case scenario for a governance model or the best relationship between Māori and non-Māori can work in governance or management of natural resources?

Billy van Uitregt: I'm going to talk about this personal experience I'm having now. I think this [example] can scale up enormously. I'm finding it that it's my job to pull people up on those inherent power imbalances and implicit biases that people enact on each other. So not only do I have to contribute to the conceptualization of the project and writing it, I also have to manage that side of the power dynamic within it; in doing that, we're going to have a commitment, we're going to have a te Tiriti based approach to this research project, te ao Māori is inherent through our outreach, we're not having a Vision Mātauranga stream or 'brown stream' on the project. We're going to sit together with parity, but in that comes lots of tensions and self-reflection that has to go on and I'm finding it's my responsibility

to engage with that. I would much prefer it's not my responsibility for the Pākehā or governments to decolonize their practice. They need to deconstruct the power structures that they enacted on others. I don't want this to be my responsibility because it's hard enough to do the job. If the oppressors who enact these power structures take responsibility for deconstructing them then that's far better for me and I can get on and actually do the job rather than do that. I've been stressing greatly the past two weeks just thinking about how to broach the problem I'm feeling. There's a bit of white fragility on the other side, but again that's my problem to deal with. It's like no, you fellas need to really understand what these power structures are and how you enact them on the other. I'm not saying it in a self-righteous way, I've been the settler colonial when I lived in Australia and it was my job to reflect on my practice and the power I inflicted on power structures to Aboriginal Aussie people. I never got it right I'm sure and there's always these invisible things we do, but they're not invisible to the other. It's beholden on the oppressor to do the deconstruction of the power structures.

Tim Snow: What do you think of the word 'majority?' Would that be more representative?

Billy van Uitregt: Majority does work, but it makes it innocuous. Like no it's an active majority and why I say oppressor is because it makes it clear to what is going on. It's a pointed term and it can be a bit loaded and gets people offside. The other part of it is changing how we talk about power structures and privilege, and treating them as a noun, as something that exists in the world while it's actually a verb which is an active thing we do to each other. Without people doing it they don't exist. Changing the conversation to be more reflective of seeing that this is something that you're doing and this is something you can stop doing it, and it's beholden on you to stop doing it. It's not beholden on the oppressed to keep arguing. The argument has been done. I think indigenous people are over the conversation to be blunt. They need to switch off from it and engage meaningfully. It's kind of locked up with different versions of the same power structures and extractive bloody industries. With my job, I'm meant to engage with Māori with the school and I'm like no I'm not the blood machinery that extracts knowledge and good will

from hapū and iwi. I try and turn it the other way and say hey while you might see me as an infiltrator, I'm their infiltrator to use. I'm the machinery in the university to extract.

Colin Reynolds: You would say that the issue the oppressor needs to know what's going on and act against it, rather than fight the other way?

Billy van Uitregt: Totally. Otherwise it's an endless conversation. In terms of our global culture, we'll smile in your face but we're trying to take something from you and that's the problem. We always seem to focus on the oppressed side of things and continually try to define and defend Indigenous identities, knowledge, cultures, world views; when in reality we need to turn the microscope a little bit to the other side and really reflect on those western, liberal ideals and deconstructing the power.

Colin Reynolds: Getting to the root cause of things and why things are actually happening rather than fighting against the institution, or what's been done.. right?

Billy van Uitregt: Yeah and staying on the fight rather than...yeah absolutely. Indigenous lives are defined by resistance and it's like oh my God, surely we could have it better, so let's stop talking about the resistance and focus on the oppression and tearing that down because that's the thing that needs to stop. If that stops then Indigenous resistance goes away.

Tim Snow: How can this dynamic of this perpetual system be changed and what are some of the challenges or ways you can go about changing that conversion on a large nationwide scale?

Billy van Uitregt: My thought would be through research because that's what I do. My plan would be to kickoff that conversation by focusing on the oppressor through a research project. For my master I planned to do all this stuff but the year was not long enough, so I'm going to try to do it now and engage with Māori researchers across the board to start theorizing how it can break down those power structures. I think that kicks

off the conversion to really switch or change where our research focus is placed. Take it off the Indigenous because we've been researched to death and start focusing on the other side of the coin.

Joe Coutcher: We plan to design a qualitative rubric to assess the governance of natural resources. **From your experience in research, if you had to make some ideal categories of 'governance factors' or traits what would they be and why? Why are they important?**

Billy van Uitregt: Awareness of power structures within these governance, policy, and research institutions in general. That would be number one. Are people aware of what implicit bias, what it is, how we all do it, so we can stop doing it? Some sort of metric around authority or voice. So if you do have two people coming together, inevitably being government and Indigenous government of some sort, is there shared power, how is the power shared? Power sharing and awareness of the power structures of the people coming to the party would be the factors I would recommend.

C.5: Interview 5: Anonymous Expert - February 23, 2021




This individual is an expert on Indigenous Studies and Human Geography. Their interests lie in understanding different climate change and environmental perceptions across cultural lenses and how different social frameworks can influence policymaking and ecological management.

This interview revolved around Māori and Pākehā relations, different perspectives among New Zealanders pertaining to the environment, and tikanga-based governance and resource management and how it can be applied to better restore New Zealand's biological heritage.

Joe Coutcher: With your background in studying different values and belief systems, and observing these interactions between people of different backgrounds and ways of life, **which kind of relationships do you find the most effective between Māori and non-Māori for protecting the surrounding environment and New Zealand's biological heritage?**

Expert: The key thing I think, I think in terms of thinking about the institutional relationships firstly, there has to be a huge amount of trust between the sort of iwi/hapū and government agencies. Whether the Crown or the New Zealand central government or their agencies and local government, because there's been a huge amount of, a lack of trust on the part of iwi/hapū because of the ongoing failures of the Crown to honor the Treaty or follow the Treaty principles, a lot of iwi groups are constantly saying "every time I get into a room I'm with people from the Crown or government officials or even local government officials and I'm having to explain the own things over and over again, they don't know what the Treaty principles are, or let alone any of the concepts we are talking about, they haven't even read the agreement we're meant to have which governs our co-governance arrangements or partnerships. So they really think that there's a lack, they feel like they're constantly having to educate people, so it takes a huge amount of time. On the flip side if you're working for the government, to generate relationships, because of the distrust and problems or ongoing institutional racism that people have experienced, so you have to spend a huge amount of time building the trust with that sort of thing. So



if you leave an institution like I left the Waitangi Tribunal, my relationships left with me, because it's the individual rather than the institution who has the prestige and power and people trust you. So that's the whole thing about relationships are often based on individuals even within institutions, having that they trust them and they actually understand and can work together. So I think it needs to be within the government and iwi that's one thing. But in terms of thinking outside of that sort of formal Treaty partnership relationships, the other key thing is if we are thinking about relationships between Māori and Pākehā or non-Māori, it's often centered on, yes there'll be different values and everything or world view, but you can bridge the divide between them when they often have shared interests or activities or things that they all value. So I've been in the room with people discussing things to do with contentious issues relating to freshwater and freshwater degradation and had farmers so the farmer sort of lobby group and iwi representatives, some of who are farmers but often they are small scale or they're sort of subsistence farmers, or they have no land and they're still tangata whenua (people of the land) and then environmental groups and recreational fishers and all the different things. And they're arguing about the government's attempts to restrict and stop cows getting near the water and pollution of waterways through influent.

And oftentimes if they talk about the issue they get into conflict. And often the conflict centers around their worldviews and political ideologies. But one of the key things that we found that was helpful was firstly, we got them talking about what they did and what they valued about the river. Their shared experiences. So they remember as kids going swimming there or catching tuna or eels or doing other things. And then often getting them discussing if they have noticed any changes. But rather than ascribing blame of whose responsible for that, thinking about what they value about it in terms of thinking about 'oh yeah I really like swimming in it, I really want to take my kids swimming there, I really wish I could still go fishing there but there's no fish in the water' and those sort of things. And focusing on what can be done collectively, to bring them together. So some stuff was to do with joint working days of river restoration or replanting areas around the river, which brought diff groups together. And rather than being focused on formal things, it was actually bringing people together. And some of them also involved taking non-Māori into Māori spaces, so onto the marae, showing them traditional fishing techniques, taking

them on walking tours of the river, and doing those sorts of things. So by personalizing it, and that the thing, it became not just a sort of political issue to discuss or an economic issue, it was a personal one, based on the relationships with these people, and the relationships with the local environment which they are all an active part of.

Tim Snow: So rather than drawing upon indigenous knowledge, and drawing upon Māori knowledge as an almost a political identity, you have to factor the two into a shared experience or grouping in order produce effective results, right?

Expert: Māori would say the same with regards to what the intentions of the Treaty was. And Māori see it as being able to walk between worlds. So you can choose to walk in the Māori world or the Pākehā one or between worlds. So a lot of the discussion about that, it's about being able to do that thing and rather than trying to integrate Māori knowledge with western knowledge it's about this in-between space between the worlds, and that's where you can find shared understanding and neither groups being forced to assimilate into others. Māori, as with other indigenous groups, are very concerned with the extraction of their knowledge and loss of authority and power associated with that.

Expert: [Speaking of use Māori knowledge] It's been very tokenistic, that unfortunately despite these attempts, it is often either an afterthought or it's just including a few words here and there.

There's been the critique about how Mātauranga Māori has become the buzzword it seems within the science and environmental management and those sorts of things. So it's generally being separated from Māori society values like language basically, everything. And so there's been critiques of the ways in which the National Science Challenges, in particular, has been using Mātauranga Māori, that they can sort of use it but in an a-political manner. That it's divorced from Māori aspirations, from sovereignty, self-determination, greater decision-making authority. That it's just used as a repository of information that could be used to fill in the gaps within scientific knowledge basically. And that rather than it being a nested system of information management practices, governance things, and sort of world views and connected to spirituality and

socioeconomic opportunities, it's all focused very much on the ways in which it can be harnessed and incorporated into some sort of scientific or technocratic approach. Which is being critiqued by some scholars, and I haven't really been privy to a lot of the sort of National Science Challenge or how it's operating, but it seems to be quite bureaucratic and it's very much this is the set thing, we do this, we do this, and we do this.

Expert: [Discussing proper Māori empowerment] Governance has to be based at the level of, I think the problem is that governance within Māori context is in the case of hapū and iwi, it can't be brought to a national level. It just doesn't work, everything has to be. Because even within Māori knowledge, there is so much difference between different areas of New Zealand and different hapū and different iwi, occupying different things. And the strategies that you use to manage a resource in one part of New Zealand is not the same as you use in another part. For instance, with snapper, Hokianga and Ngāpuhi only have a snapper which is actually undersized, because the big ones are the breeders. That contrasts with the governance rules around fishing, you only can get the big ones. The iwi argue that actually, you should get the small ones because that's how you maintain the breeding and everything. Elsewhere in New Zealand they don't have the same practices.

Returning to the question of where knowledge is and how it's governed, any attempt at having a national governance thing having to do with Māori knowledge is just going to end up in a complete shitstorm. Māori hate this notion of tribalism and things. For those who are iwi Māori, it's always whānau, hapū, iwi, and then Māori and then things, so it's really hapū and iwi, and even within hapū and iwi they fight, but you're still related to one another so you really can't divorce them.

Expert: [Speaking of governance models] One of the critiques that I'm aware of is when they have governance things it will be like, "oh yeah we talked we had an iwi writ," but a lot of the things that actually good governance in terms of Māori things would be sort of having meetings taking place on the marae, so they actually take place in Māori spaces, so Māori don't have to go to sort of western spaces like a council office or something. And that means that you're going to get inclusion beyond just a few like politicians. That you're

actually going to get the whole hapū attending these meetings.

And it also addresses something that isn't really talked about in these things but is an important issue, but it's the lack of inclusion and representation of Māori women and Māori womens' voices. Because Mātauranga Māori like any indigenous knowledge, is held by distinct groups, and it can be age, gender, but also family lineage and those sort of things. At present oftentimes we're doing research and these sort of projects and stuff, and it's only men who are being talked to. So a lot of Māori womens' knowledge is not being included or heard. And that's partly because of a lot of the sort of patriarchal structures and everything within tribal things, but also within Western institutions not filtering that sort of thing. But if you have within the marae space there's the ability for women to participate in ways that I think good governance needs to involve to include that because it's an important area of environmental management or biological heritage that isn't really addressed, especially because women are often responsible for certain aspects to do with the harvesting of key resources or something to do with medicine, or often to do with food preparation, so all of those sort of things are important

Another category I suppose would be to, as I said, I think the degree to which people feel like that there's equity, and also access to information, there needs to be things, so not just participation, where people can access information in a format that they can understand and read and those sort of things. Because oftentimes say there's a tendency to distribute everything between email and something like that, and not everyone has email and access to that sort of thing. So those sorts of things having to do with equity and access to information are important. And also that as well as people's voices being heard, that they are able to shape decisions and so some sort of way or metric that looks at whether iwi or stakeholders or whoever feels their voices or different values are influencing the decisions being made.

Expert: New Zealand has always had a very devolved governance structure within a large portion of the decision-making, it's been devolved from the central government to local government. But the problem arises when the local government is not legally classified as Treaty partners, and so they don't get the same level of responsibility as the central government, which is classified as the Crown. So that means local government

has gotten away with a hell of a lot because under the Local Government Act they are not classified as Treaty partners. Whereas the central government and big government agencies have made a lot more efforts, the local government has been able to get away and continues to get away with a hell of a lot, because big government actually has some legal things as Treaty partners.

I think there has to be some sort of legislation change which specifically requires the local government to recognize mātauranga and also incorporate principles of partnership, Treaty partnership, and to be practiced. And that that broad thing would be then filtered through into local governance having to incorporate that. So that would also mean when local governments are not doing right, it would not be up to iwis to find funding, to mount legal cases.

Appendix D: Interview Summaries

D.1: Objective 1

Interview with Dr. Carwyn Jones

The key points of this interview relating to objective 1 were:

- Tikanga was the first law of Aotearoa before European contact and although it has fallen out of existing power structures in favor of colonial and western law, tikanga has survived in Māori circles and iwis.
- More and more, tikanga and mātauranga Māori are drawn upon as references to inform upon western power structures and legal settings (legislative, management, and judicial settings).
- Post-settlement governments must include more indigenous laws and practices in their constitutions (tikanga Māori) and reflect the values of the locality or community.

Interview with Mr. Thomas (Tame) Malcolm

The key points of this interview relating to objective 1 were:

- More recently, some structures and councils exist at the local level wherein western science and tikanga are married to achieve effective community solutions to environmental management.

- Examples of the Whanganui River and the Te Urewera Forest as having mana, or a legal personality set precedents for tikanga Māori having a much greater sphere of influence in local legislation.
- Māori values and value-driven strategies should be considered in the management of natural resources and EBM.

Interview with Dr. Nicolas Lewis

The key points of this interview relating to objective 1 were:

- Tikanga can be easily integrated into approaches to understanding the environment and applying EBM.
- Tikanga Māori emphasizes a strong holistic notion of environments that include people, and non human actors, environmental forces.
- Mātauranga Māori can be a huge asset to governance because “it puts a break on technocratic lunacy,” provides a sense of ‘how to do things differently.’

Interview with Dr. Vincent (Billy) van Uitregt

The key points of this interview relating to objective 1 were:

- Māori often have to teach Pākehā about tikanga Māori, but Pākehā people never teach Māori people their values; inherent disparity between mātauranga Māori and ‘mātauranga Pākehā’ and how the two are treated contemporarily.
- Mātauranga Māori and Māori perspectives are often drawn upon as a commodity or repository of Indigenous information, sometimes (can be argued) for publicity.
- Tikanga and mātauranga Māori should not be integrated into western worldviews or science (or vice-versa), they must be two separate entities, sitting side by side; focus on deficiencies or limitations of your worldview and look through others’.
- Western science and values try to adopt bits and pieces of tikanga Māori and mātauranga values that fit their agenda and “fill in the gaps” in a safe way.

Interview with Anonymous Expert

The key points of this interview relating to objective 1 were:

- The introduction and promoting the use of Māori spaces in governance is often not

considered when looking at ways to help bridge the divide in Pākehā-Māori relations (the use of the marae and tikanga-based spaces).

- Being able to “walk between worlds” is critical to bridging this gap of perspective and knowledge.
- Tikanga and traditional customs can vary iwi-to-iwi.

D.2: Objective 2

Interview with Dr. Carwyn Jones

The key points of this interview relating to objective 2 were:

- The Treaty settlement process has undergone a ‘constitutional evolution’ to reflect the dynamic relationship between the Treaty, the Crown, and Māori.
- The settlement process can create internal tension within Māori communities regarding the financial and cultural redressing of native lands and assets.
- Well-being, in terms of the health of the environment and the communities that engage with it, is important when considering effective natural resource management.
- ‘Sustainable development’ can sometimes perpetuate issues of commercialization of environmental management, further degrading the environment and its mauri.
- Restoration, revitalization, and sustainability are key concepts in managing the ecosystem.
- Transparency, responsibility, and accountability in management and governance are oft forgotten factors of indicators that can lead to positive biological heritage outcomes.

Interview with Mr. Thomas (Tame) Malcolm

The key points of this interview relating to objective 2 were:

- Structures of governance and management often vary locally with different sources of funding for restoration and pest control projects.
- Mātauranga Māori should be at the forefront of governance and policy, leading the conversation and policy with tikanga and kawa at the forefront (Māori protocol or etiquette); western models required for additional planning

- There is often a perpetual problem of the Crown coming to Māori with the problems and not vice-versa; creates an environment of “marketing [rather than] genuine engagement.” Māori should be given proper resources to investigate problems and study solutions themselves and co-laterally with the government.
- Māori have a strong sense of place which reinforces their knowledge of their locality and tūrangawaewae (place of standing).
- Funding for Māori environmental projects can be much easier at the local and regional level rather than at the Crown or central level - perpetuation of bureaucracy and complacency of policy substance.
- Māori not being treated as an equal partner of the Treaty is oppressive and indicative of a dark history of systemic racism, perpetuates a lack of trust in the political system.
- Funding for Māori projects vary situationally based on Treaty settlement, some aren't managing as much money; DOC being a funding agent may prove helpful in engaging people and promoting environmental sustainability.
- Inclusion of Treaty principles, truth, integrity, communication, and locally-tailored solutions are critical to the effective success of environmental management.

Interview with Dr. Nicolas Lewis

The key points of this interview relating to objective 2 were:

- Classical economics and environmental practice can help inform upon and understand management; encouraging the stewardship of our resources.
- Strategies related to [work](#) in creating a sustainable blue economy highlight the effectiveness of instituting formal stewardship roles among communities.
- Flexibility of governance anchored in legislation (highly recommended strategy) can greatly help to promote creativity, not obstruction of community relationships.
- Māori are a huge asset to New Zealand's environment.
- Customary managements vary locally by factors and strategies; see [Kaikoura Marine Management Act](#).
- Funding is often an unnoticed dimension in local and central interplay; capacities to plan and fund are much more challenging locally and regionally.

- Holistic ecosystem scale or whole of ecosystem reform is the great challenge of regulating interactions between ecologies, economy, agriculture, society, culture.
- Māori typically make plans for projects with very long investment horizons (can be 500 years) because they plan for future generations; often unnoticed.
- Marine management is unique because of its nature as a “commons” and a shared space; whereas, land management is more technical and challenging.

Interview with Dr. Vincent (Billy) van Uitregt

The key points of this interview relating to objective 2 were:

- Often there’s a practice of ineffective, inherent understanding that westernology is the dominant and the better worldview versus Indigenous perspectives.
- Authority and power sharing is oftentimes formally and informally uneven in Indigenous interactions with decision and policymaking at all levels of government and society.
- One effective model, for example, is the [Waka-Taurua](#) or double-canoe method, wherein kaitiakitanga and EBM are married in a management system.
- There is often a lack of awareness of inherent power structures or hegemonic dynamics at the center of contemporary society, culture, and politics.
- The government needs to allow Māori the space and resources to approach them with problems, not always vice-versa.

Interview with Anonymous Expert

The key points of this interview relating to objective 2 were:

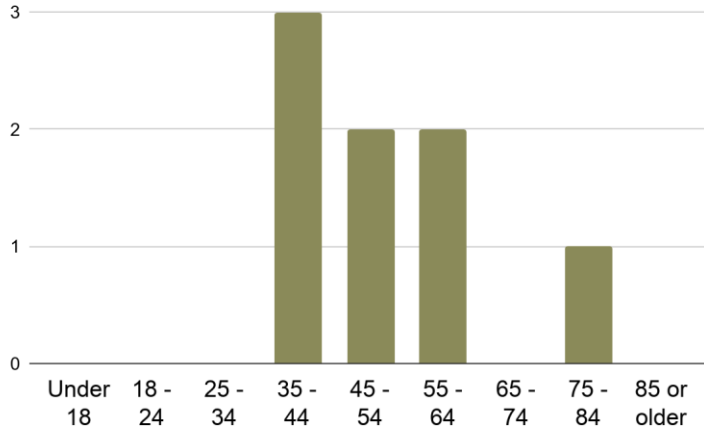
- There is a lack of knowledge of Māori principles and the Treaty of Waitangi on the side of the Crown or government.
- Māori iwi do not trust the Crown because of failures to uphold the Treaty.
- Concept of the “tokenistic” Māori and using “buzzwords” like mātauranga Māori in order to decolonize governance, scholarship, and management; isn’t that simple.
- Māori perspectives are typically an after thought or just taken in bits and pieces.
- Land courts typically side with western science, so Māori ways of thinking are often silenced.

-
- Recommendation for legislation change that requires local government to incorporate stronger relationships with Māori to ground co-governance principles and mātauranga Māori in legislation.

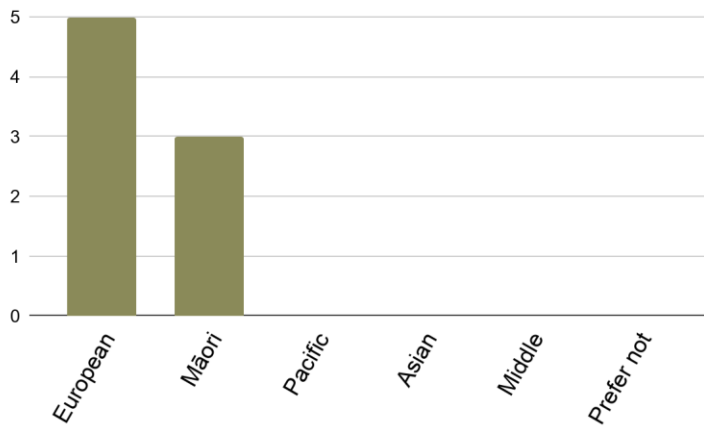
Appendix E: Supplementary NSC Survey Data

Demographics and Background Information

1). What is your age?



2). What is your ethnicity?



3). What city or town do you live in currently?

Number	Responses
3	Auckland, NZ
1	Christchurch, NZ
1	Hamilton, NZ
1	Waikato Region, NZ
1	Wellington, NZ

4). Are you involved in New Zealand's Biological Heritage Challenge? If so, what is your role?

Number	Responses
1	Yes
1	No
1	Co-lead of an SO
1	Kao
1	Researcher
1	Received some funding in the past

Agree or Disagree and Listing

In order to better support New Zealand's biological heritage and natural resources, understanding diverse community perspectives can help support local knowledge to better evaluate governance and management strategies.

The following questions will ask about your thoughts and experience with New Zealand's environmental decision-making.

5). Please select what best represents your position on New Zealand's approach to environmental governance.

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree	Don't know enough to answer
I am satisfied with the environmental health of my region and its native species.	3		1	1		

7). Please select what best represents your view on the inclusion of Māori knowledge and participation in your community and local governance arrangements.

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree	Don't know enough to answer
My community is accepting and inclusive of Māori culture and knowledge.		2	1		1	1
Māori perspectives are well represented in my local government's decision-making.		3			1	1

8). List some words or short summaries you would use to describe the inclusion of Māori perspectives in decision-making and governance of natural resources. Other comments:



Short Answer

Our project intends to recommend governance strategies and policy mechanisms that better support and restore New Zealand's biological heritage.

The following questions will ask you about your thoughts on existing governance mechanisms.

9). Do you think governance and policy processes are currently adaptive, fair, and effective in addressing New Zealand's biological heritage?

o Yes (please explain your answer)

3 responses

- Need to separate these aspects out

o No (please explain your answer)

3 responses

- Evidence suggests otherwise
- Not yet, on their way though

10). Please share recommendations for better directions or strategies your local or regional governance could take with regard to environmental and natural resource management.

- More money for controlling pests and weeds, stop attracting tourists to national parks
- Link taxation to degradation

11). What is the best or most effective co-governance arrangement that you are aware of, specifically as it relates to the management of natural resources? Why is this arrangement successful?

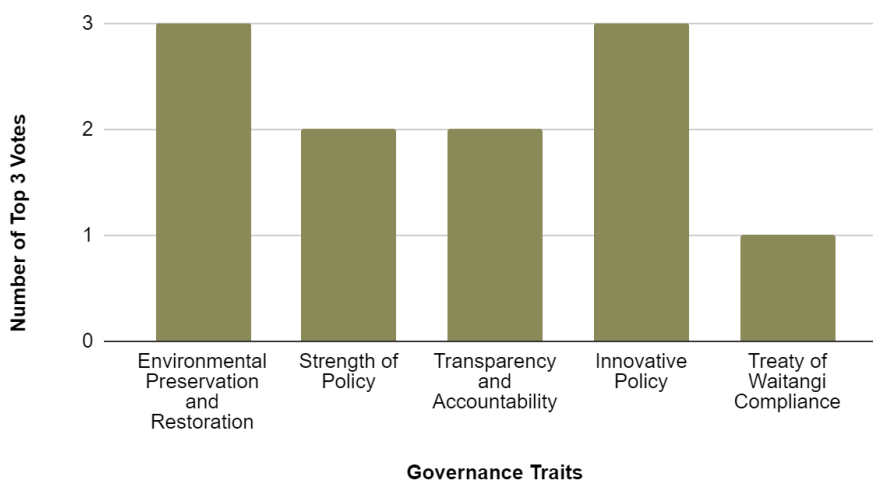
- I'm not aware of any successful co-governance arrangement
- Te Kawa o Te Urewera

12). We plan to design a qualitative rubric to assess the governance of natural resources in order to recommend strategies that better restore biological heritage.

Rank the following governance traits that you would define as important to you, 1 being most important and 9 being the least:

- Transparency and accountability
- Inclusion of community partners
- Public engagement
- Environmental preservation and restoration
- Strength of policy
- Treaty of Waitangi compliance
- Innovative policy
- Community feedback system
- Other recommendations

Number of Top 3 Votes For Governance Traits



***Note:** All three of the “Environmental Preservation and Restoration” top three votes were ranked #1 for the survey participants’ importance. This trait had the most #1 votes.

13). Why do you think those traits are important?

- Very hard to rank - all these aspects are important and work together

-
- Science and regulations are essential

14). Do you have any additional comments or feedback?

N/a