UiT The Arctic University of Norway

Faculty of Humanities, Social Sciences, and Education

Singing the Song of Conservation

Influence of Biosecurity on the Indigenous Ngāi Tahu Land within the Mt Aspiring Region

Andrea Milovan

Master thesis in Master of Philosophy in Indigenous Studies, IND-3904

May 2024

Singing the Song of Conservation

Influence of Biosecurity on the Indigenous Ngāi Tahu Land within the Mt Aspiring Region

A Master Thesis submitted by

Andrea Milovan

Master of Philosophy in Indigenous Studies

Faculty of Humanities, Social Sciences and Education

UiT – The Arctic University of Norway

May 2024

Supervised by

Professor Torjer Andreas Olsen

Centre for Sami Studies

UiT

Cover photo: Taken in Haast Pass, overlooking Tititea National Park, depicting Aotearoa as the white cloud encompassing its far-reaching mountains

Acknowledgments

Firstly, I would like to thank my supervisor, Torjer Andreas Olsen, for believing in my vision and my potential as a writer, and as a researcher. His guidance greatly strengthened this study, as well as my academic and creative writing. I am deeply grateful for his aspiration to continuously challenge me while supporting me through my process.

Furthermore, I would like to extend my utmost gratitude to Hamish Ormond, with whom I had a conversation while I was focused on Ngāi Tahu land usage within Mt Aspiring NP – the initial proposed topic. The conversation with Hamish served as an inspiration to conduct this current study, as his trust in me to share his personal experiences, and the passion he has for taiao (environment, nature, world) motivated me to further investigate the Predator free dilemma. That ultimately led to the change of research topics. Thank you Hamish, for I will always cherish the conversation we had, as it led me to finding my passion.

My lifelong friend Aleksandra Paic, with whom I came to Aotearoa and traveled through the island, including all whom I met during my time spent there, have in one way or another shaped this study. Through sharing their knowledge and experiences, they led me to certain people, policies, or articles. I would not be who I am, therefore, this study would not be what it is, if it was conducted anywhere else but on Te Wai Pounamu, with the support of its diverse inhabitants.

Lastly, I would like to thank my colleague and cherished friend Welmoed van Hoogen, for lending me her ear, time and time again, listening to my monologues while I was trying to grasp all the intricacies surrounding this study. Thank you for being an amazing friend, an invaluable colleague, and always pushing me to think outside of my boundaries.

With love and the utmost excitement to share this study with you all,

Andrea Milovan

To all the members of my family that I get to share this rite of passage with
and the ones who are no longer present in their physical forms.
Through metaphysical presence, your spirits guided me
as your energies and undying love
remain ever-present.

Abstract

This thesis is braiding the disciplines of Indigenous Studies, Social Sciences, and Environmental Studies by investigating the extent to which the currently implemented biosecurity measures interact with Indigenous peoples' fundamental rights to self-determination and rights to traditional lands. That is done in the context of Ngāi Tahu Tino rangatiratanga within Tititea area (Mt Aspiring national park) in Aotearoa New Zealand. Biodiversity conservation is a matter of contention in Aotearoa as its biosecurity measures include ground and aerial distribution of harmful toxins throughout the country. As the Crown uses toxin disposal adjacent to the sites of special significance called *Töpuni* and in populated areas of *Taonga* (treasured) species, bordering valued bodies of water within the Tititea region, stronger inclusion of Ngāi Tahu fundamental rights is paramount. Weaving Indigenous and Western plural approaches to methodology and theory, through the concept of He Awa Whiria (Braided Rivers), in the following study I have examined the two knowledge streams' interactions in official policies and practices, regarding the contemporary Predator Free movement. Overall findings speak of the need for the development of novel predator eradication tools, formed in an advanced and inclusive socio-political environment. As well as the necessity for additional localized research braiding the disciplines of this study.

Glossary of terms

Aotearoa – New Zealand

He Awa Whiria – Braided Rivers

Kaitiaki – guardians, stewards

Kaitakitanga – guardianship

Ki uta ki tai – from mountains to the sea

Kuapapa Māori research – doing research the Māori way

Iwi – tribe(s)

Hapū – kinship group

Hinengaro - mind

Mahinga Kai – food gathering centers

Mana whenua – traditional rights over the land

Māori – Indigenous peoples of New Zealand

Mātauranga Māori – Māori knowledge

Mauri – life force

Ngāi Tahu – the South Island tribe

Papaptūānuku – the Earth's mother

Pounamu - greenstone

Pūrākau – traditional stories

Ranginui – the sky father

Taiao – environment

Tane (Tānemahuta) – ancestor of the environmental features

Taonga – treasured tangible and intangible object

Tikanga - custom

Tititea – Mt Aspiring

Tino rangatiratanga – self-determination, full chieftainship

Te Tiriti o Waitangi - the Treaty of Waitangi

Te Wai Pounamu – the South Island

Töpuni – sites of significance to Māori

Wāhi Tapu – sacred place

Wai – water

Wairua - spirit

Whakairo – carving

Whakapapa – genealogy, linage

Whānau – extended family

Whenua - placenta, land

Table of Contents

1. Introduction

Aotearoa New Zealand is globally recognized as a ‘biodiversity hotspot’ (Bioethics panel, 2019), and as such biosecurity in consideration to biodiversity is one of the country’s central discourses. Seeing Te Tiriti o Waitangi (the Treaty of Waitangi) being Aotearoa's founding document, pest control implemented on Māori traditional lands blends the societal, environmental, and political disciplines - into one. As Aotearoa is now legally bound to implement Mātauranga Māori (from here on Mātauranga) in governmental documents following the Wai 262 ruling (Te Pānui Pāpāho, 2022), the increase of toxins usage through the Predator Free 2050 program is nationally contested. Thus, I have conducted an interdisciplinary study, combining Indigenous Studies and Social Sciences, with elements of Natural Sciences, regarding methods of biodiversity conservation in Aotearoa New Zealand.

Braiding various knowledge streams, through plural approaches to methods and theory, I am examining current policies and practices of predator eradication within the Mt Aspiring region, in the context of their implications on Taonga – treasured objects by Māori, appearing in physical and meta-physical form (Te Pānui Pāpāho, 2022). Interaction with the landscape of Te Wai Pounamu has shaped the traditional practices of Ngāi Tahu which in turn formed their way of knowing through the concept of Mātauranga and Kaitakitanga (Stewart, 2020, Williams 2012). Therefore, weaving Indigenous and Western knowledge streams, and strengthening consultations on environmental management is paramount to develop novel, equally inclusive methods of biosecurity.

1.1. Topic and research questions

The health of our planet is crucial for all the Earth’s inhabitants, regardless of our various backgrounds, hence the contemporary loss of biological diversity is one of the most contentious public, socio-political, and ecological discourses globally. As the new research suggests that biodiversity loss might be the driver of recent and rising outbreaks of infectious diseases (the Guardian, 2024), the need for novel tools inclusive of diverse ways of knowing is imperative. Indigenous peoples being the primary guardians of nature (Robinson, 2010), whose traditional rights to land and sovereignty are acknowledged in international laws such as UNDRIP (United Nations Declaration on the Rights of Indigenous Peoples) and ICCPR (International Covenant on Civil and Political Rights) (nhri.no, n.d.), fair inclusion of their

traditional knowledge is essential in legislation and practices, from socio-political and environmental perspectives. In Aotearoa New Zealand, Māori rights are further accounted for in Te Tiriti o Waitangi (the Treaty of Waitangi) the country's founding document signed in 1840 (Ruru & Kohu-Morris, 2020).

Since the arrival of humans in Aotearoa, 40% of native birds have gone extinct, rainforest area on the land has been significantly reduced, wetlands have suffered 90% loss, and introduced plants now make up for the majority (Craig et al., 2000). That led to six Māori claimants lodging a claim against the Crown on behalf of them and their iwi in 1991 (Wai, 1991) - widely known as the Flora and Fauna Claim (Wai 262 Secretariat, 2024). Wai 262 focuses on the Crown's denial of Tino rangatiratanga (autonomy) to manage, protect, conserve, and implement Mātauranga regarding indigenous flora and fauna (Potter & Rauika Māngai, 2022). While the government recognized the claim in 2020 and secured its implementation within the 2022 budget (Te Pānui Pāpāho, 2022), at the end of 2023, the National Party currently in power, argued against UNDRIP's utilization in Aotearoa's legislation on the grounds of racial separatism, endorsing Aotearoa's withdrawal from the declaration (Karunanidhi, 2023). If the Crown does so, Aotearoa will be the first country to reject the UNDRIP after its ratification (Karunanidhi, 2023), which could potentially set back the protection of Māori rights.

Issues of biodiversity conservation are complex, as they stem from diverse ways of perceiving reality, which is in interplay with different actors and their ways of knowing, and context (Midgley, et al., 2017). Thus, to examine the issue of conservation methods in Aotearoa and their implications on indigenous flora and fauna I have braided multiple disciplines, through Indigenous and Western approaches to methodology and theory. Inspired by McFarlane & McFarlane's (2015) He Awa Whiria (Braided Rivers) approach, as a metaphor for the rivers running through the South Island - the island where Mt Aspiring is located, I am applying kuapapa Māori research on conducting research involving Taonga (tangible and intangible treasures) and Mātauranga Māori (Potter & Rauika Māngai, 2022). Mātauranga Māori is further a part of the theoretical framework, in combination with ethical pluralism, striving to uplift both streams of knowledge in search for novel methods that account for what is important to people – as a whole (Rawluk et al., 2018). The approach to methods is also

plural, as methodological promiscuity is a way to decolonize research by acknowledging diversity in Indigenous research (Andersen & O'Brien, 2017).

Nowadays, ownership and management of Aotearoa's Töpuni (sites of special significance) and Taonga are still largely under the Crown's regulations, as it has been since the signing of Te Tiriti (Ruru & Kohu-Morris, 2020). Filing the Wai 262 claim, Māori sought reclamation of their self-autonomy regarding the management of Taonga whereas Taonga is considered as "being those things and values which Iwi / Māori treasure, material, non-material, tangible and intangible" (Te Pānui Pāpāho, 2022). Introduced predators and invasive species have and are posing one of the biggest challenges to Taonga, thus biosecurity and conservation methods require an integrated approach, accounting for Māori ideology. Preservation and conservation of nature in Aotearoa is primarily aimed at areas regarded as National parks, which make up around 30% of all landmasses (Ruru, 2004). Te Papa Atawhai - the Department of Conservation (DOC) remains one of the main actors in the conservation of indigenous species and is currently on a mission to eliminate pests (possums, rats, stoats) through its Predator Free 2050 program (Craig et al., 2000, DOC, 2020) - predominantly through aerial and ground disposal of 1080 toxin (sodium monofluoroacetate) (Russell et al., 2015).

Töpuni and Taonga within Mt Aspiring National Park (that this thesis is focused on), identified in the Mt Aspiring Management Plan – such as Rees Valley, Dart Slipstream, Route Burn Valley, Makarora River and others (DOC, 2011) - are not exempt from predator control through poison distribution. Due to invasive techniques used, Aotearoa's principles of pest control stand as controversial on a national scale. Moreover, it is argued that the influence of Māori on those measures is limited (Craig et al., 2000). Poisons used, such as 1080 raise concerns amongst Māori and have led the Maniapoto Tribal Government (2018) to file a *Notice of Cease and Desist* accusing the Crown of *Crimes against Humanity and the Environment* for applying and advancing the usage of 1080. The poison itself has been regarded by *the Material Safety Data Sheet* (MSDS) as highly toxic as 30 grams of bait containing 0.15% 1080 could kill an adult human (MSDS, 2021). Consequently, there is a possibility of secondary poisoning through carcasses of the poisoned animals (MSDS, 2021). That is not exclusive to 1080, as other disposed toxins, such as PAPP and brodifacoum contain similar properties that will be discussed further in the project. Today, around 45% of the country's total landmass has been under some kind of pest control monitoring or management (Bioethics panel, 2019), as

Aotearoa constitutes the top buyer of 1080 toxin on a global level, using 90% of the world's supply (Whiting O'Keefe, 2014).

Considering quantities of the poison used, implications of it on the environment are being raised. The protection of Aotearoa's Taonga stands as the key objective of Predator Free 2050, with its vision being to "return the voices of the insects, bats, reptiles and birds back to the forests, farmland, towns, cities and coasts" (PFNZ, 2020; 9). Thus, the purpose of this study is as follows:

Problem statement

Introduced pest control measures are an omnipresent discourse in Aotearoa, New Zealand concerned with toxin distribution especially. In consideration of Tino rangatiratanga o Ngāi Tahu within Mt Aspiring region, following the Wai 262 ruling, I want to look into:

Research question

To what extent is Aotearoa's government facilitating the protection of Taonga through PF 2050?

Working questions

What are the current methods of pest control within the Mt Aspiring region?

According to the available research, to what extent are these eradication methods enabling the realization of the PF2050 vision?

How is the government making efforts to consult with Māori representatives in decision-making, and strategy-building proposals?

Is there an implementation of Mātauranga Māori in the official governmental documentation (such as Biodiversity strategy, Conservation methods strategy, Predator Free 2050, etc.,)?

Seeing the care for Taonga and its protection as the focal point of the Predator Free movement, the objective of this study is to first understand how the concepts of Taonga, protection, ecosystem, and concepts alike are understood through relevant ontologies (via Aotearoa's authoritative bodies and Mātauranga Māori). That sets the paradigm for the philosophical thought behind the biosecurity measures currently in place and is expected to be

carried on until 2050 in its present capacity. How do these predator eradication methods influence Taonga in practice, whereby Taonga is understood as treasured tangible and intangible elements of Ngāi Tahu within Mt Aspiring region, is the overarching objective of this research.

1.2. Töpuni and Taonga

Throughout the whole country of New Zealand, there are defined sites of significance to Māori – known as *töpuni*, and treasured species for Māori called *Taonga*. Within the Mt Aspiring region, those sites, and species have been recognized in the Mt Aspiring Management Plan. As stated in the plan "the concept of töpuni is derived from the traditional Ngāi Tahu tikanga (custom) of persons of rangatira (chiefly) status extending their mana and protection over a person or area by placing their cloak over them or it" (DOC, 2011; 142). Although Töpuni does not nullify the national park status, it gives recognition to Ngāi Tahu historical, spiritual, traditional, and cultural relationship regarding certain sites within the park, through Deeds of Recognition (DOC, 2011). According to the Deeds of Recognition, there are three Töpuni sites within Mt Aspiring - Tititea (Mount Aspiring), Pikirakatahi (Mount Earnslaw), and Te Korokö (Dart Slipstream) (DOC, 2011). This project will focus on the distribution of poison and trapping methods on those sites, as well as the sites considered to be 'biodiversity hotspots' within the park – such as Makarora, Young Valleys, Dart catchment, and Haast Pass (DOC, 2011).

Recognition of Taonga species within the Mt Aspiring management plan is done by giving respect to the Ngāi Tahu Claims Settlement Act 1998. The Settlement Act states that "the Crown acknowledges the cultural, spiritual, historic and traditional association of Ngāi Tahu with some of their Taonga species" (DOC, 2011; 143). It is important to highlight that not all species important to Ngāi Tahu have been recognized as Taonga, which has been acknowledged within the Mt Aspiring Management plan. Currently, the plan lists "49 indigenous birds, 58 plants, seven fish, five shellfish and six marine mammal species" (DOC, 2011, Appendix 1), some of which are endangered and managed by DOC. Taonga can also be related to an intangible concept, such as Mātauranga Māori. For the purposes of this thesis, the concept of Taonga will be used as seen through Wai 262, thus "is defined as all the elements of an iwi estate, material and non-material, tangible and intangible" (Potter & Rauika Māngai,

2022; 17). The objective behind the recognition of both Töpuni and Taonga is to give space for the inclusion of Ngāi Tahu values when it comes to the management of those sites and their involvement in the establishment of practices, strategies, or plans concerning those concepts. To which extent that is done in connection to predator control, is going to be analyzed throughout the project.

1.3. Relevance

Beyond the universal importance of biodiversity, cultural diversity in relation to biological diversity, and how cultures aid in the advancement of endangered species and biodiversity loss help bridge the historical separation of culture and nature (Pilgram et al., 2009). Cultures that have interacted with nature for generations built their values around it (Pilgram et al., 2009), which can be argued is the case for Māori traditional beliefs. Subsequently, Māori have developed a system of knowledge – Mātauranga Māori "an experiential system, [that] emphasizes relationship-based learning using whānau and hapū understandings in our own environments" (Broughton et al., 2015; 83). Hapū in te reo Māori (Māori language) is understood as a kinship group holding political power, formed by members of whānau (community) (Te Aka Māori Dictionary, n.d.). Incorporating that knowledge into the existing principles of conservation has the potential to revitalize the environment, as it holds an understanding of nature that surpasses the limitations of Western sciences (Pilgram et al., 2009).

However, within Western epistemology, Mātauranga has often been neglected through marginalization (Broughton et al., 2015). To ensure an inclusive present, the implementation of Māori disciplines of conservation, and strengthening consultation processes are the crucial points of departure. Moreso following DOC's Predator Free 2050, it is estimated that there is enough poison distributed to kill tens of millions of people (Kelly, 2020). In addition to that, Les Kelly (2020; 240), argues that the PFNZ program was established "in order to destroy any wildlife in areas that contained valuable minerals or were suitable for farming and forestry". He refers to it as "destruction to allow for production" (Kelly, 2020; 240). If his hypothesis proves right, such principles of conservation not only compromise Māori relationship with the environment, but the environment itself. Thus, it is of utmost importance to evaluate the current

predator control measures and the effect they have on töpuni, Taonga, and wai within the Tititea region.

1.4. Initial research and process leading to the topic

Initially, my thesis project was focused on the use of land for Māori within Mt Aspiring National Park, their inclusion in the management of the park, and policies regarding the usage of the park for their traditional practices. I came to Aotearoa, New Zealand to conduct fieldwork which included observations of the park and interviews with the park's officials. I arrived for a period of two months, landing in Queenstown, immediately noticing large amounts of roadkill.

Observing the cultural landscape in Makarora, I kept on coming across big brown boxes with cells, hiding everywhere in the bush along the track. A local resident said they are meant to catch predators that harm native birds but had no information about the ways to keep native birds safe from being harmed. Opposite one of the entrances to Tititea NP, I noticed a sign informing of the need to boil the water before usage due to the disposal of 1080 in the area. Similar signs were found around Ngāi Tahu farm next to the southern end of the park, Dart River, and Routeburn track. My focus slowly started to shift, as I felt this was a pressing issue.

During the whole period of fieldwork, I remained focused on my initial research up until I finished and reviewed the data gathered. Photos, diary entries, and an interview conducted, all kept circling back to predator control as one of the biggest dilemmas within the national park, and Aotearoa in general. Through unofficial conversation, I got a sense of the most prominent concerns about 1080 disposal. However, as strong as the public's reluctance to use it is, the urge to protect native flora and fauna surpasses it. As 1080 has been used since the 1950s, this was the solution they are more comfortable with than the alternative – biodiversity loss. I aimed to contribute to the community with my research, and as Predator Free NZ started recently, in 2020 and it entails an increase in poison control, I decided to change the focus of my thesis. I see this as an expansion to my previous research, as the current research moves beyond usage of the land, and encompasses the intangible aspects of the ecosystem, as per Māori ontology.

1.5. Methodological approach

My methodological approach is influenced by the He Awa Whiria – the Braided Rivers, the theoretical approach of which is elaborated on in the theoretical chapter. For the methodological approach to be influenced by this specific theory, means that I am using both Western and Indigenous approaches to methodology. That is done through methodological pluralism in combination with drawing inspiration from Rauika Māngai's proposed methodological approach when conducting Māori research engaging with concepts of Mātauranga Māori and Taonga. There are strengths and limitations to using both of those approaches, jointly and separately, which are elaborated on further below in this chapter. Braiding the practices is to incorporate Western and Indigenous knowledge as complementing to each other, thus mending some of the limitations of their separate use and of this research. In the Indigenous and the Western academia, there are similar approaches braiding various fields of study, thus I could have used a myriad of concepts. In consideration to the scope of this study, I opted to focus on the narrowly focused conceptualizations.

1.5.1. Rauika Māngai Methodological Approach

Rauika Māngai is a panel of representatives consisting of "Māori scientists, research leaders, and programme managers at the national forefront of Vision Mātauranga implementation" (MoRST, 2007; 5). Vision Mātauranga refers to the implementation of Mātauranga Māori through different governmental sectors, to advance research in all departments (health, education, conservation, and so on) (MoRST, 2007). Following the Wai 262 ruling, Rauika Māngai developed two guides to assist native and non-native researchers who engage with Mātauranga Māori in their research - *A Guide to Vision Mātaurang*a and *A Wai 262 Best Practice Guide for Science Partnership with Kaitiaki for Research Involving Taonga*. As I am both using the concept of Mātauranga Māori in this thesis and conducting research involving Taonga, I find it necessary to follow the principles of those guides to the largest extent possible while acknowledging this research's limitations.

To say that I was inspired by this approach and that I will use it to the biggest extent possible means that ideally, research drawing on Mātauranga Māori is to be co-developed with the kaitiaki of whose Taonga the research is focused on. In my case, that would be to conduct

this thesis with Ngāi Tahu o Te Wai Pounamu, which for various reasons mentioned below, I was unable to do. Of the 10 drawn principles in the Guide for approaching the research involving Taonga, about half of them refer to co-designing the project with kaitiaki, their leadership in projects, benefit-sharing, building a respectful relationship, and principles alike (Potter & Rauika Māngai, 2022). I recognize the limitations of this thesis as it has not been co-developed with Ngāi Tahu o Te Wai Pounamu. There are various ways I aimed to remedy possible restrictions of this research such as heavily relying on literature written by Māori researchers, community members, and representatives, to incorporate Māori voices in every aspect of this research. As suggested by the Rauika Māngai panel, I have recognized Māori as the experts on Mātauranga Māori (MoRST, 2007) thus, to describe the concepts relating to Māori knowledge, I am relying on literature written by Māori writers and scholars.

Furthermore, I have committed to following the other principles fully, such as respectful usage of te reo Māori (Potter & Rauika Māngai, 2022). I have been devoted to learning the phrases I applied to the research and am trying to truly comprehend their expansive meaning. Language being one of the central aspects of creating knowledge that is shaping our realities (Midgley et al., 2017), I find it of utmost importance to apply te reo Māori to this research. To obtain the basis of te reo Māori when discussing concepts of Mātauranga Māori and Taonga is further imperative as I am non-Māori, coming from a Western background.

Lastly, as recommended by Rauika Māngai in the Guide, I am pursuing excellence through ongoing learning about the interdisciplinary fields coming together in this thesis, with an aim to develop new knowledge in the forms of novel methods of biosecurity (Potter & Rauika Māngai, 2022). The objective of this research is to benefit the community and to add to the public discourse on this topic in order to develop new methods equally inclusive of Māori knowledge, as much as the Western one (Potter & Rauika Māngai, 2022). Lastly, as per the Guide's advice, I am combining knowledge stemming from various sources and scientific fields - in an effort to answer the research question in an informed, impartial, and just manner. These principles are further combined with methodological pluralism - as an approach setting a similar standard to research.

1.5.2. Methodological Pluralism

Inspired by ethical pluralism, I am using methodological pluralism as a research approach that takes into account different ontological and epistemological perspectives when analyzing complex issues (Midgley et al., 2017). The distinct perspectives in this study are accounted for by using various methodological sources when approaching methods discussed in the text below. This practice "recognizes the strengths and weaknesses of all working methods through the use of a meta-theory that allows their complementarity" (Midgley, 1991; 147). Meta-theory in this sense is actualized through using a framework within a framework – the Braided Rivers model that combines Indigenous and Western knowledge uniformly. In that fashion, I have braided the concept of Mātauranga, narrowed regionally to Ngāi Tahu kaitakitanga, with the ethical pluralism practice. The methodological approach is linked to the theoretical framework which is further explained in the third chapter of this thesis.

A pluralist approach to methods is suitable when conducting Indigenous research as it takes a part in "the indigenization process where researchers invoke indigenous knowledge to inform ways in which concepts and new theoretical frameworks for research studies are defined, new tools of collecting data developed, and the literature base broadened" (Chilisa & Tsheko, 2014; 224). By applying the Indigenous and Western methodological approaches and theory, using a wide range of data and literature, I am striving to employ the so-called methodological promiscuity - as a way of addressing methodological diversity in Indigenous studies (Andersen & O'Brien, 2017). Lastly, as argued by Chilisa & Tsheko (2014), Indigenous mixed methods require using data that reflects historical practices, contemporary climate, and projects into the future. I have engaged in that through the discussion of data demonstrative of the creation of the present-day socio-political climate in the second chapter of this thesis, while contemporary trends that project into the future are mirrored through PF 2050 as the concurrent movement expected to run for the upcoming 25+ years. Historical background and its present-day implications are further connected with the attested claims by Māori, resulting in the latest court rulings respectful of Māori fundamental rights, ratified by Aotearoa's government as an impending requirement.

Considering the hierarchical construction of governmental regulations, a combination of different actors and contexts, and their ways of knowing and applying their respective

knowledge, methodological pluralism is used when "mixing methods drawn from a variety of methodological sources" (Midgley & Lindhult, 2021; 654). In relation to this study, I am using universal laws such as UNDRIP and ICCPR as internationally recognized regulations protecting and ensuring the fundamental rights of Indigenous Peoples. Subsequently, Te Tiriti is used as Aotearoa's founding document, assuring Māori autonomy and management of natural resources and traditional land. The principles of Te Tiriti are required to be respected and implemented in all the official governmental documentation – such as policies analyzed in this thesis. *The Biodiversity strategy, the Conservation Management Strategy* for Otago, *the Mt Aspiring NP Management Plan,* and *the Predator Free 2050* have all, to some extent implemented the Braided Rivers approach by giving respect to Te Tiriti, usage of Māori concepts and language. Hence, one of the methodological sources of this study is an array of governmental documentation, stemming from the founding documents to locally and regionally focused policies.

To work towards decolonization of the study is to recognize the data that communicates dominant cultures through the use of language, concepts, and others, and to strive towards reflective analysis in an effort to interpret the data in a just manner (Chilisa & Tsheko, 2014). Subsequently, although the government is obliged to give respect to Te Tiriti, the dominant structure within those documents is arguably of the settler kind, which led to claims and testimonies filed by Māori as a collective community, and from distinct iwi. Those claims (Wai 262 and Notice of Cease and Desist) are based on Māori views and perspectives, however by the essence of filing the claim – they remain braided in its practice. While the claims emphasize Māori attitudes, the nature of failing the claim, whereas native perspectives are required to adjust to the non-native space of the judicial system, results in engaging with two systems of knowledge. Thus, methodological pluralism allows us to comprehend different ways of knowing, which creates our realities, without favoring one specific reality, singular knowledge, or a certain method over the other (Midgley et al., 2017). Pluralism derives from the critique of structures of exclusion and seeks a way to amend the marginalization through the transformation of existing knowledge (Chilisa & Tsheko, 2014). Alongside official documentation, testimonies, and claims, I am using newspaper articles, scientific papers by different actors, in various contexts, and other relevant literature as a methodological source neutral from the power balance between the settler state (Aotearoa) and Māori.

The third category of mixing the methods, shaping the methodological pluralist approach into methodological triangulation is observation of the cultural landscape during the conducted fieldwork. That further plays a crucial part in theoretical triangulation referring to the identification of varying ontologies that are in direct interplay with each other (Chilisa, 2020). While the findings are limited in their capacity, as the topic of my thesis has changed subsequently since the fieldwork, it is the observation of the Mt Aspiring region that inspired this thesis. Hence, observations of the cultural landscape do not make for a large scope of data but serve as the basis for this study. It is by using these three categories of methodological sources that I am trying to answer the research question, influenced by neither Western nor Indigenous perspective, both informed by both. That leads us to the next section of the thesis - methods.

1.6. Methods

Methods in this thesis are conveyed through primary and secondary sources of data gathering and data analysis. Indicated in the text above are the national and local policies used and drawn in consideration of Aotearoa's founding document Te Tiriti. Subsequently, the analyzed primary sources are *Te Mana o Te Taiao - Aotearoa New Zealand Biodiversity Strategy 2020, Otago Conservation Management Strategies (CMS), Mt Aspiring National Park Management Plan,* and *Predator Free 2050*. The second part of the analysis is examined through a mix of primary and secondary sources such as the DOC's promotional material, governmental reviews of toxin disposal, and research conducted regarding the current biosecurity methods applied through the Tititea region and nationally. That is done to look more closely into the predator eradication methods as such and their implication on Taonga. The collection of data and its analysis, reflexivity, restrictions, and literature used are further described in the continuation of this chapter.

1.6.1. Data Collection

The primary data sources are chosen due to their relevance regarding this thesis topic, and the scope of this research. The governmental policies in Aotearoa are drafted in accordance of many other Acts. Those are following: *Te Tiriti o Waitangi 1840 (the Treaty of Waitangi), Wildlife Act 1953, National Parks Act 198*0, *Conservation Act 1987, Resource Management*

Act 1991, Te Ture Whenua Māori Act 1993, Ngāi Tahu Pounamu Vesting Act 1997, Ngāi Tahu Claims Settlement Act 1998, Käi Tahu ki Otago Natural Resource Management Plan 2005, Conservation General Policy 2005, General Policy for National Parks 2005 and documents alike. In continuation, the current policies are required to give principles to the first Wai 262 ruling in 2011 which "emphasises that governments should facilitate kaitiakitanga of natural resources by Māori" (Towns et al., 2019; 251), the final Wai 262 ruling that aimed to incorporate Mātauranga Māori in the 2022 budget and others. Thus, there was an array of governmental policies to choose from.

Taking into account the scope of this study, its objective, and the regional focus, I have chosen four relevant policies regarding biodiversity protection and pest control within the Mt Aspiring area, and their approach to conservation. Those are NZ Biodiversity Strategy 2020, Otago Conservation Management Strategies (CMS), Mt Aspiring NP Management Plan, and Predator Free 2050. In addition to those, I am analyzing information found on governmental websites, guidelines, and reviews by governmental agencies. Lastly, government-initiated promotional materials such as booklets and flyers acquired in Mt Aspiring visitor centers in Wanaka and Makarora are examined. Furthermore, the legal allegations directed at Aotearoa's governmental bodies filed by Māori, in the forms of a claim or notice of cease and desist are chosen, as sources portraying the tension between the settler state and Indigenous peoples. Additional secondary data includes newspaper articles accounting for incidents in terms of toxin disposal, testimonies by different actors (scientists and Māori members in terms of 1080 usage), guidelines by Māori representatives on how to approach consultations on biosecurity, research papers showcasing implications of current methods, and literature elaborated on below.

As supporting data rather than the basis of this thesis, I am using observations of the tracks I have visited, as well as the NP offices in Wanaka and Makarora. Observations of predator control within the Mt Aspiring area include the cities within the region, such as Queenstown, Makarora, Wanaka, Kinloch, Glenorchy, Lake Hawea, and other small settlements. In addition, observations of the tracks within the Mt Aspiring area are used to a certain extent, as well as the informational panels found on the side of the tracks. The tracks I visited are following: Roys Peak Track (16,25 km), Isthmus Peak Track (15,77 km), part of the Routeburn Track (31,54 km in total out of which I walked around 10 km), Wanaka Millennium

Walkway (27,58 km), Hawea River Track (20,28 km), Lake Sylvan (14,64 km), part of the Rees Dart Track (60, 52 km in total out of which around 20 km was observed), Mt Shrimpton Track (10,62 km), Makarora Bush Walk (0,64km), Mt Chrichton Loop Track (7,56 km), Lake Dispute Track (6,12 km), in addition to other small walks following part of tracks.

Lastly, in the attached Appendices I included the list of Taonga species as found in the Ngāi Tahu Settlement Act 1998, including birds, plants, marine mammals, and fish species. Moving on to the attached list of birds and plant species found in the Mt Aspiring region as seen in the NP Management Plan. As well as the table of areas of toxin disposal and trap distribution in the Mt Aspiring NP, and the record showing sites of control of introduced plant species within the park.

1.6.2. Data Analysis

To analyze the data gathered, I am using pluralistic data analysis which involves the usage of multiple analytical techniques to reflect the complexity of the investigated phenomena (Clarke et al., 2016). As such, to analyze the primary sources in this thesis (the governmental documentation), I am applying textual analysis that I further interpret following the principles of discourse analysis (DA), searching for discursive patterns within the relevant documentation. Textual analysis in combination with discourse analysis allows me to investigate the structural forms and linguistics used in official policies in depth. As argued by Smith (2006; 83) “texts are multifunctional social spaces which facilitate cognition and representation of the world, and social interaction”. In consideration of that, within the regulations analyzed, I am searching for the definitions of conservation, biodiversity, biosecurity, sustainability, preservation, and other related concepts to investigate the discourse of the concept of conservation as seen in the current environmental management policies. Moreover, I am searching for Māori concepts as seen through Mātauranga Māori as demonstrative of Māori representation of the world. The objective of textual analysis is to analyze to which extent is the Western and Indigenous knowledge braided within the official documentation, and how Māori ontology interacts with the set principles of conservation. Thus, I find textual analysis to be a fitting tool for answering my research and working questions.

Applying pluralistic methods to textual analysis enables me to view distinct ontologies as complementary, rather than in opposition, to one another (Clarke et al., 2016). Further

developing it through DA means that I am searching for patterns related to the context of biosecurity measures in relation to the current political and social climate (Boréus & Bergström, 2018). That is to say, I am analyzing "how categories are used, and the claims and evaluations that are made when particular subject matters are treated in a particular context" (Boréus & Bergström, 2018; 13). The chosen documentation is developed through numerous categories; therefore, the subject of predator control will be connected to Töpuni and Taonga within the Mt Aspiring region. Approaching the analysis of documents systematically, searching for contradictory statements, conservation descriptors, and patterns, I aim to uncover how much space is given to Ngāi Tahu when it comes to having decision-making power regarding conservation practices and predator measures within the Mt Aspiring region. Seeing that the governmental documents are drafted in accordance with the dominant discipline, discourse analysis accords for "how sentences cohere linguistically into discourse; how social organization is made up; how cognition is respecified in interaction" (Hepburn & Potter, 2004; 169). Thus, DA principles are used to tap into ideologies, values, and context creating the basis for the contemporary climate surrounding biodiversity conservation discourse in Aotearoa.

Taking into account that "discourse is constructed and constructive" (Hepburn & Potter, 2004; 173), analysis of the environmental discourse is further connected to methodological pluralism in consideration of historical, contemporary, and prospective reflexivity. DA enables us to understand how systems historically constructed influence present-day practices and their possible implications in the future – the transformative nature of system production. Moreover, within discourse analysis, validation of the results remains open, as the objective is to present the findings in an unbiased manner, allowing "readers to make their own checks and judgments" (Hepburn & Potter, 2004; 178). That is particularly important for this study, as the phenomenon of biosecurity measures and its implications for Māori is convoluted, seeing that there are multiple ways of determining the ethics of the current practices. Inclusiveness and recognition are thus the basis of the analysis, as seen further through the practice of ethical pluralism. As ethical pluralism transcends the usage of a singular theory, recognizing that knowledge is multifarious, methodological pluralism accounts for the same principles of applying multiple methods to decolonize Indigenous research. By applying a pluralistic approach to the theoretical and methodological framework, I am striving towards greater validity and reflexivity, accounted for below.

1.6.3. Positioning and Reflexivity

As a white, European woman, there are many guidelines I need to follow when conducting Māori research and remain aware of my pre-determined biases. Considering the research fatigue in Aotearoa (Tuhiwai, 2022), the research must have a decolonizing agenda. In this project, I aimed to attain that objective by shifting the research focus according to observations of one of the most crucial contemporary dilemmas in Aotearoa – the means of predator eradication. However, that decolonizing agenda is subjective and drawn from what I see as essential or urgent. Thus, I am constantly trying to reflect on my preconceived biases as "Indigenous research methodologies involve critical reflections concerning cultural sensitivity, cultural protocols, and respectful ways of doing research" (Virtanen et al., 2021; 18). Furthermore, as a vegetarian for the past 20 years, and thus a person who did not come across dead animal bodies often (or roadkill), I need to be aware of those cultural protocols that differ from the ones I have grown up with and was raised accordingly to, as a member of Western European society. That requires decentering myself to be able to conduct valid research in connection to Indigenous challenges (Virtanen et al., 2021).

Additionally, I am using the two guides by Rauika Māngai and Potter mentioned prior as self-reflection tools. As a non-Māori person, my comprehension of the spiritual importance of certain places, birds, and plants is limited, since my knowledge and reality have not been shaped by interactions with the South Island landscape. I recognize that due to the differences in both personal and academic upbringing, I cannot claim expertise on Māori ontology, or Aotearoa's environmental management choices. However, I can remain informed, continuously learning and up-skilling my knowledge to reproduce valuable insight into the topic. Reflexivity is furthermore crucial when analyzing the study through methodological pluralism in connection to ecological sustainability. As argued by Midgley and Ocha-Arias (2001; 618), working with those phenomena "implies a reflective process in which knowledge, and the process through which it is obtained, is subject to deep revision through attempts to unveil the grounds which give meaning to phenomena". Considering that I am analyzing a set of complex structures, contemporary yet shaped by and affiliated with historical practices involving a multitude of actors, the objective of this research is to bring to light the processes led to the implementation of the existing protocols and analyze their implications. Such reflexivity is equally important when working with Māori knowledge and its connotation within biosecurity

conservation, and Western structures that have and are shaping the conservation measures applied within Aotearoa and specifically the Mt Aspiring region. Through reflection, I am striving to stay informed, and not influenced by Indigenous or non-Indigenous perspectives.

1.6.4. Restrictions and challenges during fieldwork

Changing the topic after the fieldwork has been conducted does lead to a somewhat missed potential. If focused on this research initially, I would have marked the locations and number of traps observed, and warning signs, and focused much more on the observation of birds and native plants. There is an array of possibilities to convey this research, the most important being co-designing the project with Ngāi Tahu, contacting different people for interviews, and conducting a survey for tourists and the general public. I am aware that due to the lack of these, there are certain limitations to the data gathered. However, I do aim to remedy those with detailed document analysis, as mentioned above and through the literature I am using for this thesis, on which I will elaborate below.

Additionally, due to a restricted financial budget, I did not have a vehicle to commute around the park with. That has put some other restrictions on the fieldwork conducted, as Mt Aspiring stretches over 350,000 hectares (DOC, 2011). My main forms of transportation were public transportation in Queenstown (located in the middle part of the park), hitchhiking around Makarora/Wanaka area (northern part), and cycling to the southern part of the park, around Kinloch/Glenorchy area. Winter conditions were an additional element adding an extra challenge, especially when it came to cycling as the park was located 16 km one way from my accommodation.

Due to those restrictions, I observed the cultural landscape of approximately 10 tracks, choosing the most relevant tracks in consideration of their proximity to my accommodation. Out of 350,000 hectares of the park, that makes for a small area. During my time in Makarora, the Blue Pools Track was closed, and thus the entrance to the Young Valley Track and Wilkin' Track. I have tried to cross the Makarora River as an alternative to getting to those tracks, however, due to its strength and speed at the time of the visit, the river-crossing presented a potential danger. Therefore, I did not manage to access them, though the reasoning behind the closure of those tracks, as well as Rob Roy's Track will be elaborated on in the findings. Young

Valley is one of the park's biodiversity hotspots within the park and an area subjected to biosecurity. To have been able to observe the track could have potentially added to the study.

1.7. Literature Review

I am using a wide range of literature to conduct this study, including the ones strongly opposing and strongly supporting the Predator Free movement in its current shape. To use such a variety of writers and scholars is to strive towards implementing two streams of knowledge - He Awa Whiria approach throughout the whole thesis. Current research is multidisciplinary, developed by scholars from various backgrounds and different interests. Although plenty of it has been done so far, biosecurity subject matter in regard to its influence on Taonga remains largely unresolved. To depict it, I implemented research conducted in varied sectors, by scholars from Western and Indigenous backgrounds.

Subsequently, Māori writers and scholars include Jacinta Ruru, Georgia Tuari Stewart, Sonja and Agnus McFarlane, Shaun Ogilvie, Makere Stewart-Harawira, Jim Edward Williams, Dan Hikuora, writers of *Kia Whakanuia Te Whenua* (People Place Landscape) book such as Jacqueline Paul and William Hatton, Rakuia Māngai panel, Helen Potter, Debbie Broughton, Kim McBreen, and others. Supporters of 1080 poison include Aotearoa's governmental agencies such as DOC, EPA (Environmental Protection Agency), NAWAC (National Animal Welfare Advisory Committee), and departments alike. Along with James C. Russell and Landcare Research Institute researchers such as Peter Bellingham, Grant Norbury, Mandy Barron, Duane Peltzer, Peter Sweetapple, Chris Jones, Andrea Byrom, and co-authors of articles featuring the mentioned authors (Manaaki Whenua, n.d.).

Landcare Research Institute is the Crown's Institute, working on environmental challenges and means of overcoming them, in partnership with Māori representatives, businesses, and communities alike (Manaaki Whenua, n.d.). The authors mentioned above are conducting research in areas of conservation, wildlife ecology, and management, and ecosystems research, predominantly in support of 1080, while searching for alternatives (Manaaki Whenua, n.d.). Moreover, Ngāio Beausoleil whose research on animal suffering is used in the analysis is the animal welfare researcher and the co-director of the Bioethics Center (nawac.org.nz, 2001). In continuation, researchers such as Sean A. Weaver (author of *Chronic toxicity of 1080 and its implications for conservation management: a New Zealand case study*)

and Charles Eason, co-author of a few articles used in the analysis, both support 1080 as an environmental tool but are apprehensive about its current management (Griffin, 2005). Moreover, other researchers used in the analysis such as Wayne Linklater and James Steer are working towards bridging the dichotomies in relation to 1080 usage and are promoting integration and inclusion (Steer, Munro, & Linklater, 2023). The opposing voices are supported through literature written by Less Kelly, Quinn Whiting O'Keefe, Micheal C Morris, J.C. Pollard, Mike Meads, and others. In the continuation of this review, I will briefly introduce the scholars whose research was used prominently in this study.

He Awa Whiria – the Braided Rivers approach was developed by Professors Sonja McFarlane and Agnus McFarlane (Irwin, 2022). Their research is used as a foundation for this thesis' theoretical approach, and their concept of the Braided Rivers has inspired every aspect of this study. The basis of the theoretical foundation is further supported by the book called *Kia Whakanuia Te Whenua* (People Place Landscape), whereas Māori representatives from various fields and iwis assisted in its realization, "ensuring that this publication is truly Māori-led" (Hill, 2021; 20). Subsequently, to develop the concept of Mātauranga Māori in this study, I used publications by Makere Stewart-Harawira, whose research centers around Indigenous peoples' knowledge and hybrid approaches to ecosystem management (apps.ualberta.ca, n.d.). Georgia Tuari Stewart is a Māori scholar conducting research that focuses "on the intersections between knowledge, culture, and education, including Māori science education, biculturalism, bilingualism and Māori and indigenous philosophies" (māoriphilosophy.com, n.d.). In this thesis, I am using her book called *Māori Philosophy*, published in 2020, to describe contemporary Māori epistemology and ontology. The book examines Māori traditional values and how they evolved and shaped into a present-day understanding of Māori thought. Her central Māori concepts, values, and knowledge terms serve as a guideline in structuring Māori philosophical framework, elaborated in the third chapter of this thesis.

In continuation, Dan Hikoura (iwi affiliations Ngāti Maniapoto, Waikato-Tainui, Ngaati Whanaunga) is appraised for his work on braiding Indigenous and Western knowledge and implementing it in research and legislation (Te Pūnaha Matatini, n.d.). *Ngāi Tahu Kaitakitanga* is developed through the work of Ngāi Tahu Jim (James) Edward Williams who is considered the pioneer in academically presenting Māori traditional knowledge (komako.org.nz, n.d.). Jacinta Ruru is a Māori scholar is "Aotearoa's first Māori Law Professor [who] last year became

a Member of the New Zealand Order of Merit for services to Māori and the Law" (twoa.ac.nz, n.d.). Her research centers around Indigenous peoples' rights especially in consideration of national parks, as Ruru is an advocate for granting legal personhood to parts of the environment (otago.ac.nz, 2023). Her publications focused on ownership and management of national parks in Aotearoa contribute to the background knowledge of the events that took place and led to the contemporary socio-political climate in the context of Māori right to exercise tino rangatiratanga. Lastly, Dr. Shaun Ogilvie whose iwi affiliations are Ngāti Pukeko and Ngāti Whakahemo is a member of New Zealand's Environmental Risk Management Authority (ERMA) (cawthron.org.nz, n.d.), and works towards implementing Māori research and voices in Aotearoa's environmental scientific sector (sciencelearn.org.nz, 2023). His study centered around the inclusion of Māori in terms of 1080 usage, as well as the review of 1080 as a biosecurity method used in the analysis of this thesis.

Alongside developing the methodological framework using guides by Rakuia Māngai panel & Helen Potter, Chilisa's publication on *Indigenous Research Methodologies* and working with mixed methods is used to strengthen, promote, and uplift postcolonial Indigenous methodologies and ontologies (Chilisa, 2020). Remaining in the international arena of research, the work of conservationist John G. Robinson on ethical pluralism and Gerald Widgley aided in the development of the Western theoretical approach. Gerald Widgley is acclaimed for his interdisciplinary approach to methods and theory, whereas one of his specialties' is environmental management (UoB, n.d.). Transpacific environmental scientists and anthropologists are further implemented through researchers Christopher Trisos, Jess Auerbach, and Madhusudan Katti, authors of *Decoloniality and anti-oppressive practices for a more ethical ecology u*sed to strengthen the theory.

A proponent of 1080 and National Geographic Explorer is Professor James C. Russell, an ecologist working globally on biological preservation and in Aotearoa closely associated with the Department of Conservation (National Geographic, n.d.). His research on methods of 1080 distribution, cost estimates, public support, and recommendations are used in the analytical chapter of this study. On the other side is Less Kelly, who strongly criticizes the DOC and Aotearoa's government in his book *Duped – The True Story Behind Predator Free New Zealand*. He claims to have established the Predator Free program, prior to DOC's PF2050, along with a small team of like-minded individuals (Kelly, 2020). Their original PF project

aimed at eliminating predators from Aotearoa through methods that do not include poison distribution as he considers current toxins used to be harmful to the environment, and the species that the government is trying to protect (Kelly, 2020). In the book, Kelly describes the decade-long process of working on the new proposal of biosecurity control with his team and collaborating with many political figures, including the Prime minister at the time. He claims that DOC stole their concept, but changed the methods of predator control (Kelly, 2020).

His alleged contribution to this idea is acknowledged in the foreword of the *Predator Free New Zealand: Social, Cultural and Ethical Challenges policy* (Bioethics panel, 2021), however, he strongly differs from being associated with DOC and the set-up of the new predator control measures (Kelly, 2020). In his work, he refers to the work of Quinn Whiting O'Keefe, whose qualifications include BA, MA, MD, and FACMI (Fellow of the American College of Medical Informatics) (Whiting O'Keefe, 2014). Whiting O'Keefe wrote a review on 1080 compounds and their effects on the environment in 2014, where he advocated for discontinuation of this practice due to its negative environmental impact. He includes scientific data as well as examples of DOC's misappropriation of the toxin in his testimony. His opinion is shared by Dr. J.C. Pollard, the creator of 1080science.co.nz, which serves as a platform for publishing scientific papers on 1080 implications to raise knowledge on the national and global level (1080science.co.nz, n.d.). Her work on insufficient consultations with Māori in terms of 1080 usage, as well as the article presenting the reasons for concern are used for the part of the analysis of this study. Pollard refers to Mead's study on the 1080 impact on insects, which is also used in the analytical chapter of this study, as well as on publications by Whiting O'Keefe.

2. Creation of the Contemporary Political and Social Environments

According to methodological pluralism, historical practices are a necessary source to understand the contemporary socio-political climate when conducting Indigenous research. That is because history enables us to understand how certain knowledge came to be and the ways of knowing. Ngāi Tahu has interacted with the landscape of Te Wai Pounamu since their arrival – an interplay that led to certain areas carrying spiritual significance and has shaped their traditional practices. Those social conducts led to the acquired knowledge – Mātauranga Māori, described through the theoretical framework. In the following chapter, I depict some of the processes that led to the creation of Mātauranga, the suppression of Ngāi Tahu Tino rangatiratanga within the Tititea region through British colonization and the establishment of the Mt Aspiring NP, followed by the introduction of predators in the area. Lastly, the Wai 262 claim is elaborated on as a 30-year-long dispute between the settler state and Māori, showcasing the tension in relation to the right of self-determination and environmental management of indigenous flora and fauna by Māori. Wai 262 encompasses colonial history, and its implications in the contemporary setting and seeks to remedy the historical grievances through co-management, co-development, and co-engagement with the Crown. The background is thus an essential tool for understanding the importance of equitable integration of plural streams of knowledge.

2.1. Māori presence on Te Wai Pounamu

The evidence suggests that the first inhabitants of Te Wai Pounamu were descendants of the Waitaha tribe (Pybus, 1954), who arrived on the island through a series of small migrations dating back from the 10th to the 15th century (Quinn, 2003). The Waitaha tribe is accredited with having named numerous landscapes around Te Wai Pounamu, today considered cultural landscapes (Quinn, 2003). Their decline occurred in the 16th century, with the arrival of Kati Mamoe who commenced enslaving and killing the Waitaha tribe (Anderson, 1982). Kati Mamoe migrated from the North Island, as a result of tribal wars on the southern part of the island, followed by Ngāi Tahu migration in the 17th century (Anderson, 1982). Kati Mamoe and Ngāi Tahu jointly annihilated the Waitaha from the area, while Ngāi Tahu attained settlements in the Ohau and Queenstown area through the Wanaka – Hawea raid and drove Kati

Mamoe south to the Wakatipu region (Anderson, 1982). From there on, the evidence of Ngāi Tahu presence is limited for the period of half a century, as their population was rather small, numbering between 4000-5000 in 1830 (Quinn, 2003).

At the time the cultural framework of Aotearoa was Māori, as Europeans living on the South Island were mostly married or tolerated by Māori (Quinn, 2003). It was the inner-tribal conflicts and the spread of diseases that led to the drop in Ngāi Tahu population. The decade-long conflicts that occurred between 1828 and 1839, led by chief Te Rauparaha of Ngati Toa significantly reduced Ngāi Tahu population (Quinn, 2003). Diseases such as measles and influenza aided in weakening the tribe, which was recognized by the European settlers interested in Ngāi Tahu land (Quinn, 2003). Restricted by the large Māori population in the North, European settlers saw an opportunity to gain control of the South, as the Ngāi Tahu tribe was not in the position to offer resistance (Quinn, 2003). This led to the singing of Te Tiriti on the 27th of May 1840 at Akaroa, and two other locations on the South Island – Otakou and Ruapuke (Quinn, 2003; 39). Following the discovery of gold and the singing of Te Tiriti, the Crown south to utilize the agricultural opportunities of Te Wai Pounamu, and left Ngāi Tahu "with barely one acre out of every one thousand acres they had once owned" (Anderson 1998; 206 cited in Quinn, 2003; 43). It is what led to the shift of Aotearoa's cultural framework, as Māori were now subjected to British rule.

2.2. Usage of the Tititea area for Māori throughout the history

As seen, historical usage of Tititea was not exclusive to Ngāi Tahu, as the Waitaha, Kati Mamoe, Ngati Toa, and other small tribes occupied parts of Te Wai Pounamu. However, for the purposes of this thesis, I will focus on Ngāi Tahu historical interaction with the area as they remained/regained mana whenua in the contemporary context. Ngāi Tahu mainly used the interior Otago area as a source of food, a central region to regain their strength, and to pass down knowledge to younger generations (Anderson, 1982). During the 19th century, central Otago was used for seasonal expeditions, occasionally prolonged up to a year in places such as Makarora (Anderson, 1982). Ngāi Tahu presence in the interior of the Otago region is assumed to have begun around 1780 (Anderson, 1982).

Māori used to cultivate potatoes around lakes Hawea, Wanaka, and Wakatipu, where they established small year-round settlements (Anderson, 1982). Māori used to refer to the Makarora area as *Kaika Paekai* or "place of abundant food" (as seen in the Mt Aspiring visitor center in Makarora, 2023). Additionally, the route passing through Central Otago (including Makarora) was important as a traveling route for Māori – as it connected the east and the west coast of Te Wai Pounamu. It was one of at least three routes connecting both coasts, important for its food resources, ceremonial functions of exchanging food items known as *kai hau kai,* and as the route used to establish alliances through cross-tribe marriages (as seen in the Mt Aspiring visitor center in Makarora, 2023).

In continuation, the Ngāi Tahu name for Wanaka stems from the meaning of the word in te reo Māori – the perpetuation of knowledge (as seen on Wanaka Millennium Walkway, 2023). It is where they established whare kura (school of learning) as hunting, gathering, and fishing practices during the summer months, enabling preservation of the goods for the winter, thus suitable for longer settlement periods (as seen on Wanaka Millennium Walkway, 2023). The school of learning was not exclusive to Wanaka, as another one – *wāhanga* was found in the Hawea area. Prior to the Te Pūoho raid, Māori used Lake Hawea as one of the *mahinga kai* (food gathering centers), with the settlement by the Neck - Manuhaea stemming as the principal one (haweacommunity.nz, n.d.).

Finally, the most important resource of Te Wai Pounamu was indeed - *pounamu*. Archaeological evidence by the Dart River suggests that its usage started in the 14th century, as pounamu was found in small quantities around the Tititea region (Whakatipu Lake, Dart Valleys, Routeburn, and the Caples) and in parts of the West coast, hence highly treasured by Māori (Quinn, 2003). There are many Māori legends explaining the origin of pounamu, most of which include some form of personification of this element of the environment, in turn speaking to the Māori ontological view, which I elaborate on in the next chapter. Moreover, the traveling routes around three lakes mentioned in this chapter – Whakatipu, Hawea, and Wanaka were developed due to a "continuous structural belt known as the greenstone mélange" (Quinn, 2003; 141). Acknowledging the high spiritual, archeological, and cultural importance, the areas rich with pounamu are reclaimed as Töpuni areas in the present context – protected through the Ngāi Tahu Deed of Settlement and under special management within the national park (Quinn, 2003).

2.3. European settlement and creation of Mt Aspiring NP

The first Europeans on Te Wai Pounamu were sailors and whalers who were either tolerated by or married to Māori (Quinn, 2003). They arrived in the 1790s, bringing potatoes to Aotearoa, and mainly lived on the south coast of the island (Quinn, 2003). Some parts of the island were already almost deserted by the time of European occupation – such as the Māori settlement by Manuhaea (Lake Hawea) where Europeans discovered gold in 1861 (Quinn, 2003). It was the combination of this discovery and the South Island Land purchases following the signing of the Treaty that led to European colonization of Ngāi Tahu land.

The South Island Purchases evolved around the Crown's purchases of Ngāi Tahu land between 1844 and 1864 (Quinn, 2003). From those purchases arose Te Kereme claim (Wai 27), in which Ngāi Tahu did not dispute selling most of these lands to the Crown. Instead, they argued that the terms of the sale were not upheld as they were to retain free usage of the 10% of the land defined as reserves (Ngāi Tahu, 2022). However, they lost all their traditional territory and with it – places of gathering, and usage of sacred sites. They took the claim to the *Native Land Court* in 1868 (Quinn, 2003) where Māori were supposed to prove their entitlement to the land, in an alien environment, in front of a Pakeha judge, following unknown procedures (Stokes, 1999; 72). It took another century for the claim to be properly addressed by the governmental institution. Indeed, The Native Land Court served as an assimilation mechanism of Māori by the Crown, ensuring the imposition of the English property law (Stokes, 1999).

It can be argued that other seemingly pro-Māori institutions in that period, had a similar nature, as up until 1985 the established Waitangi Tribunal could only make "recommendations to the Crown on breaches of the principles of the Treaty of Waitangi" (Quinn, 2003; 43). The goal was indeed colonization, through assimilation of culture, control of resources, and imposition of Western values. After several attempts to regain control of the ancestral land, ultimately in February 1991, the Waitangi tribunal ruled in favor of Ngāi Tahu, recognizing the Crown's breach of the Treaty, and commencing a settlement between the iwi and the Crown (Ngāi Tahu, 2022). From that emerged the Ngāi Tahu Settlement Act 1998, through which Ngāi Tahu regained the control of Aoraki/Mt Cook, received an apology from the Crown, and were compensated with $170 million to re-establish their traditional relationship with nature (Ngāi Tahu, 2022). Although in theory that implies Ngāi Tahu's autonomy to exercise their customary

rights, in practice those rights are still somewhat contested. That brings us to the creation of national parks in Aotearoa and more specifically Tititea - Mt Aspiring National Park.

The Treaty initially "guaranteed Māori te tino rangatiratanga, the unqualified exercise of their chieftainship, over their lands, villages, and all their treasures" (Sanders, 2017; 208). However, it was disregarded by 1877 and all the land was proclaimed as terra nullius (Ruru, 2008). Seeing a series of events and new legislations occurring in the mid-1880s, Māori tried to find ways in which to protect their lands from the European settlers. Thus in 1887, they gifted the Tongariro mountain range to be proclaimed as a national park in joint co-management between the Crown and Māori (Ruru, 2008; 106). To ensure that the Park is co-managed, the chief's condition for gifting the land was to appoint his son to the management board. Even though The Crown did so, the chief's son had very little influence, enabling the government to pass the Tongariro National Park Act in 1894 "with a provision that permitted the government to confiscate from the tribe land surrounding the gifted summit" (Ruru, 2008; 107). According to the discourse on nature at the time, the Department of Tourism and Health Resorts was appointed to manage the parks (Ruru, 2008, Harper & White, 2012).

Tititea was first declared as a national park in 1964 and at the time it covered just under 200 000 hectares, compared to today's 355 543 hectares (DOC, 2011). In 1990, its 'outstanding universal value' was recognized by UNESCO and proclaimed as a World Heritage Area (DOC, 2011). It is the third largest national park in Aotearoa, "one of the world's great protected areas of mountain and forest wilderness" (DOC, 2011; 12). However, the preservation of its unique flora and fauna was a secondary thought as national parks were considered and advertised as tourist destinations, an economic benefit increasing the country's GDP. In fact, invasive plants were released into the parks, in addition to other pests, such as goats and deer to provide game for hunters (Walrond, 2008). Conservation was an afterthought and the consequences of it are still omnipresent throughout the whole country of Aotearoa.

2.4. Introduction of predators on Te Wai Pounamu

At the time of Māori arrival on the South Island, seals and dogs were the only mammals living in the area, whereas nowadays it is estimated that 34 mammals occupy the country's landmass (Craig et al., 2000). In terms of non-native plant species, six were introduced by Māori, while today's non-native plant species count is as high as 2400 invasive species,

compared to 2300 native ones (Craig et al., 2000). One of the main drivers leading to the growth of the mammal population and non-native plant species was the settler's introduction of pests to Aotearoa around the mid-1880s (Henare, 2008). In many cases, brought-in predators to control these pests later turned into pests themselves.

For example, the first Europeans brought ship rats, and Norwegian rats, along with mice (Brockie, 2008). To eliminate rats and mice from the ships, European whalers and sailors started bringing cats on boats, however, their efforts were in vain as the invasion of rats quickly spread across the island, and cats now joined the list of the introduced predators in Aotearoa (Brockie, 2008). Following the efforts to eliminate one predator by introducing another – stoats were thought to eradicate rabbits but have also rapidly increased in population, adding to the predator list. The introduction of goats to control blackberry and gorse backfired, as well as the introduction of wild pigs - predators of native flora and fauna (Brockie, 2009). Possums were introduced to Aotearoa in 1873, brought from Australia as they were deemed highly valuable for their fur (Brockie, 2008). Concurrently "European colonization started with the further reduction of seals and sea lions even in the subantarctic islands" (Craig et al., 2000; 65).

A second driver leading to the decline of biodiversity stems from the pursuit of timber and agricultural practices (Craig et al., 2000). The scale of agricultural production in Aotearoa is large, with farmlands making up 50%, while the world average is 25% (Craig et al., 2000; 65). In comparison, only 3% of the country's ecosystem kept its Indigenous character (Craig et al., 2000). Waterways have not been exempted from the invasive species – as the new water weed called Didymosphenia geminate (Didymo) was found in the waterways within Tititea National Park and in the areas surrounding the park (DOC, 2011; 33).

When it comes to invasive species and predators that pose the most threat to Tititea National Park, deer are on top of the list. Within the park, different species of deer are found – out of which red deer stands as the most problematic pest harming indigenous flora and fauna (DOC, 2011). Additionally, tahr, chamois, goats, possums, mustelids, rats, mice, and stoats are found by Rees and Dart Valleys, East and West Matukituki, Upper Waipara Valleys, Dart Catchment, Haast Pass and Makarora/Young Valleys (DOC, 2011; 33/35). The introduced animals pose a threat to indigenous vegetation, prey on nests of native birds, and thus have a significant impact on the landscape and biodiversity of an area (Craig et al.; 2000). The control of non-native plant

species is a bit more challenging, with 18 weed species within Tititea identified as invasive ones, impacting the park's biodiversity (Craig et al., 2000). Their location within the park largely overlaps with the location of predators, as the invasive weeds are mainly found in "Matukituki, Rob Roy, Young, Dart, and Waiatoto Valleys" (DOC, 2011; 38). Since there are no suitable means of weed control – that would not harm indigenous vegetation as a side-effect, invasive plants continue to spread along the park, changing the structure of the park's ecosystem.

2.5. Protected waters and sites within Mt Aspiring region

In consideration of the historical usage of the park for the ancient Waitaha, Kati Mamoe, and Ngāi Tahu, certain areas of the park have been proclaimed as having cultural, spiritual, and/or historical significance. That has been recognized under the Ngāi Tahu Settlement Act 1998, from which the park's management plan partially draws, as well as giving principles to Te Tiriti of Waitangi (DOC, 2011). Following Ngāi's Tahu relationship with the landscape within the park, three Töpuni areas have been identified and given the status of Specially Protected Area - Tititea/Mount Aspiring, Pikirakatahi/Mount Earnslaw and Te Korokā (Dart /Slip Stream) (DOC, 2011; 24). Due to significant pounamu resources in Te Koroka, and therefore – the special spiritual significance the area has for Ngāi Tahu, public access to it has been restricted (DOC, 2011). Additionally, through the Ngāi Tahu Act 1997 (Pounamu Vesting) all pounamu – "greenstone, including all nephrite, semi-nephrite, bowenite and specific serpentine resources" (DOC, 2011; 27) is under the authority of Te Rūnanga o Ngāi Tahu. It is through permission of Te Rūnanga o Ngāi Tahu or rūnanga kaitiaki pounamu, who manages pounamu, that the area can be accessed (DOC, 2011).

Furthermore, rivers in the park have an important value on a national scale, as they are some of the clearest waters in Aotearoa (DOC, 2011). In the Mt Aspiring Management Plan is it stated that "The Dart River/Te Awa Whakatipu, along with the Rees and its tributaries, the Route Burn and its tributaries in the park, have been officially recognized for their outstanding natural, amenity and intrinsic values as part of the Water Conservation (Kawarau) Order 1997" (DOC, 2011; 41). The waters in the park are rich in freshwater species, adding to their freshwater biodiversity value, significant for Tikanga Māori (DOC, 2011). Additionally, wetlands with their rich aquatic fauna also aid in the park's adverse ecosystem (DOC, 2011).

As seen throughout this chapter, areas with the highest biodiversity have both spiritual significance and are under the biggest threat due to introduced pests. Thus, the focus of predator control is on the following areas – Dart catchment, Haast Tokoeka Kiwi Sanctuary, West Matukituki Valley, and Makarora/Young Valleys (DOC, 2011). That can have several implications on the environment, and therefore the Ngāi Tahu's relationship with those areas, in accordance with the predator control used. To what extent that occurs and what those implications will be examined throughout this thesis.

2.6. Wai 262

Initial lodging of the Wai 262 claim goes back to October 1991, when members of six different iwi came together and jointly brought "together a large number of kaupapa relating to breaches of Te Tiriti o Waitangi from across more than 20 Crown ministries into a single claim" (Potter & Rauika Māngai, 2022; 13). That resulted in the claim being one of the biggest ones placed, more so as it raised the issue of intellectual property rights of Māori and their mana whenua over indigenous flora and fauna (Potter & Rauika Māngai, 2022). Thus, Wai 262 was often referred to as the Flora and Fauna Claim and Cultural Intellectual Property Claim (Wai 262 Secretariat, 2024).

In the last 30 years, the claim was amended a few times, in consideration of the ongoing colonial practices of the state, which resulted in the Wai 262 encompassing all tangible and intangible aspects of Taonga. Consecutively "this includes but is not limited to: mātauranga; whakairo; wāhi tapu; biodiversity; genetics; Māori symbols and designs and their use and development; and associated indigenous, cultural and customary heritage rights in relation to such Taonga" (Potter & Rauika Māngai, 2022; 17). In its essence, it raises the right of Māori to freely practice their ontology. Furthermore, the biggest concerns of the claimants are the following:

> *"The Crown has failed to actively protect the ability of Māori to exercise Tino rangatiratanga and kaitiakitanga in relation to indigenous flora and fauna, mātauranga Māori and other Taonga…the Crown has failed to protect Taonga…the Crown has usurped the Tino rangatiratanga and kaitiakitanga of Māori in relation to Taonga through the development of policy and the enactment of laws; and…the Crown*

has entered into international trade agreements and obligations which further impact on Taonga" (Potter & Rauika Māngai, 2022; 17).

Issues raised do not only refer to the historical practices of the state in the period of the last 30 years but require a contemporary engagement of Aotearoa's government to implement Māori values within the official policy regulations. It is argued that the Crown has restricted and neglected Māori sovereignty pertinent to Indigenous flora and fauna, hence, to enforce Māori ontological perspective within the contemporary governmental documentation is to advance the development of novel methods.

After the 2020 ruling - in which the Crown recognized the claim and was obliged to implement the Wai 262 within the 2022 budget, Te Taumata Whakapūmau - "the whānau and iwi who whakapapa to the original Wai 262 claimants" (Wai 262 Secretariat, 2024; 4), have been developing an approach known as *Tohu* to determine procedural outcomes of the ruling (Wai 262 Secretariat, 2024). In consideration to that, they have started a process – *Kanohi Ora,* through which Māori have the space to negotiate ngā kaupapa o Wai 262 with the Crown (Wai 262 Secretariat, 2024). Tohu follows four objectives to secure Māori engagement in new policymaking. Those are *Te Mana* – referring to creating a group of well-informed whānau & iwi claimants, *Te Kōrero* – meetings between different groups and stakeholders in an effort to raise awareness, *Te Tikanga* – focused on strengthening the consultation processes with the Crown to "preserve, protect and promote Taonga & mātauranga Māori" (Wai 262 Secretariat, 2024; 18), and lastly *Te Whakawhitiwhiti* that refers to "supporting the emergence of a national Māori voice to speak with the Crown on ngā kaupapa o Wai 262" (Wai 262 Secretariat, 2024; 18). This framework is the first step in raising Māori engagement in policy-making processes, that protect and promote Mātauranga Māori throughout all spheres of the lived experience.

3. He Awa Whiria Theoretical Framework

This study is inspired by the He Awa Whiria (Braided Rivers) approach conceptualized by Ngāi Tahu and Ngāti Whakaue scholars Sonja and Agnus McFarlane. The term is a metaphor – representing the braided rivers of Te Wai Pounamu that run from the mountains to the sea (Ki Uta Ki Tai) and have shaped the lived experience of Ngāi Tahu (Scobie et al., 2021). As a theoretical approach, He Awa Whiria combines two systems of knowledge – the Western and the Indigenous one – creating a plurality of knowledge both interacting as equals. Just like rivers, the systems of knowledge stream together in a union, creating space for learning, not assimilating (McFarlane & McFarlane, 2019). A plurality of singular knowledge in a community is within itself not singular, as distinct realities emerge from what can be defined as the *Cultural Interface* (Olsen & Sollid, 2022). One's spaces are relational as they emerge from multi-layered and dynamic interplays of social, linguistic, educational, political, and spaces alike that an individual in a community, and the community are a part of (Olsen & Sollid, 2022). Thus, the research on those issues belongs in the same discourse of the cultural interface.

The practice of blending Indigenous and Western approaches to theory is used "as a means of achieving socioculturally grounded evidence-based practice" (McFarlane, McFarlane & Webber, 2015; 62). The objective of such a model is to enable the weaving of both cultures, whereas both ontologies act as proportional and equivalent in relation to each other. It is moving beyond the grievances, into reconciliation, acknowledging the strength deriving from using interdisciplinary methods in the creation of novel tools and practices (McFarlane, McFarlane & Webber, 2015). The framework is based on the belief that a combination of two ontologies - can produce more powerful knowledge than using a singular one (McFarlane & McFarlane, 2019).

Hence, to conduct this study, I have created a theoretical framework inspired by Mātauranga Māori as a foundation of Māori philosophy of science, with a regional focus on Ngāi Tahu kaitiakitanga as an iwi-specific customarily sustainability system. Living with such a diverse landscape has enabled Ngāi Tahu to develop intricate systems of environmental management, constantly transforming and ever-expanding in accordance with the political and cultural climate. Those are elaborated on below, in combination with Ethical pluralism as a Western-oriented academic approach to biodiversity conservation recognizing that there is no

singular knowledge stream applicable to solve complex phenomena such as biodiversity loss as it is actor-specific and context-specific. It furthermore acknowledges the importance of both plurality and multilingualism as decolonization tools, imperative regarding Indigenous peoples' lands and the connection established with it being the primary stewards of nature (Robinson, 2010).

3.1. Mātauranga Māori

As mentioned in the methods section, I acknowledge my limited understanding of Mātauranga Māori, being a non-Māori person, and recognize Māori as the experts on Mātauranga (MoRST, 2007). I have used kaupapa Māori research to remedy those limitations - and am striving towards staying reflective throughout the whole process of writing. Further, I recognize that Mātauranga Māori is a discourse within itself, emerged from interactions with the environment that shaped the way Māori perceive reality.

Mātauranga Māori in its simplest terms refers to Indigenous Māori knowledge (Stewart-Harawira, 2020). Although many associate it with traditional knowledge, the concept is ever-expanding, and it includes the new, as well as the old knowledge. Furthermore, "Mātauranga Māori is classified as Taonga – a treasure to Māori, or something that is precious" (Potter & Rauika Māngai, 2022; 51). As such, it requires protection, respect, and understanding of the concept to be used properly, both in policy-making processes and in research. It is argued that mātauranga has been misused, viewed, and implemented as inferior in consideration of Western knowledge (Potter & Rauika Māngai, 2022). Thus, this project aims to work with the Indigenous and the Western knowledge uniformly, in an informed manner, by presenting the aspects of Mātauranga, and ethical pluralism as two streams of knowledge that have the potential to complement each other if used equitably, rather than oppose. The aspects of Mātauranga are presented below.

Mātauranga Māori is "a method for generating knowledge, and all of the knowledge generated according to that method" (Hikuroa, 2017; 6). As such, it denotes a philosophy of science, a way to expand on other forms of knowledge and to understand their restraints, enabling us to further conceptualize Mātauranga (Stewart, 2020). Additionally, Stewart (2020) explains that the concept means both knowledge and understanding. Mātauranga has been developed through generational observation of nature, adaptation to its elements, and

monitoring of animal behaviors. It has emerged in accordance with the changes in landscape, and therefore, its evolution is ongoing. Historically, these understandings of nature have been orally transmitted through *pūrākau* – stories that are often nowadays referred to as myths (Hikuroa, 2017). It is argued that to relate pūrākau with myths is to disregard the Māori ontological narrative (Hikuroa, 2017).

Through pūrākau, we are able to understand the connectedness between Taiao (the universe) and the natural world humans are a part of (Hikuroa, 2017). The connectedness between "all elements of the natural world– human and more-than-human, physical and meta-physical" (Hikuroa, 2017) is further explained through the concept of *Whakapapa*. Whakapapa is considered a fundamental principle of Mātauranga, as it enables us to understand Māori ontology through genealogies (Wilkilson et al., 2021), however, the concept of whakapapa can be used as a verb too as it "has a wide range of meanings and allusions not applicable to genealogy" (Stewart, 2020; 59). In Māori cosmology/genealogy, our ecosystem consists of *Papaptūānuku*, *Ranginui,* and their 71 offspring (Stewart-Harawira, 2020). Thus, pūrākau describing the separation of Papaptūānuku and Ranginui is following "the tears of Ranginui as he looked down Papaptūānuku joined with the mists that arose from her body and became the wai-rua (two waters), or spirit, that animates all life" (Stewart-Harawira, 2020; 3). Wai (water) is integral to the Māori worldview – as indicated by the concept of braided rivers.

Originally, it was Tāne (Tānemahuta or Tāne-nui-a-Rangi), who separated his parents to allow the light to enter the world (Stewart, 2020). He is considered to be the "ancestor of mankind and all the trees, birds, insects and other land animals and plants" (Stewart, 2020; 58). Tane's significance in understanding Māori ontology is furthermore expressed through pūrākau of his ascendance to the heavens, from which he accrued *ngā kete e toru o te wānanga* or the three baskets of knowledge (Stewart, 2020). Different iwi can have distinct representations of certain events, however, the idea of the three baskets of knowledge is universal to all (Stewart, 2020). Hence, *te kete tuauti* is considered the basket of sacred knowledge – beyond sensory perception, most similarly understood as the world of physics and chemistry in the West (Stewart, 2020). The second kete is *te kete arouniu* – the basket representing the knowledge of the natural world – the sensory basket of knowledge serves as the guide to environmental ethics, while the third basket (*te kete tuatea*) represents the world of deities (Stewart, 2020).

In addition to the baskets, Tāne brought two stones with him (*kohatu*), that carry *mauri* (spiritual essence of an object) (Stewart, 2020). Mauri is considered a life force, omnipresent in all physical and meta-physical aspects of the living world (Stewart-Harawira, 2020). Mauri ora refers to the health of the water, which is tied to the health of the community living by that body of water (Stewart-Harawira, 2020). However, the mauri of an object, a place, or a person is shifting in accordance with the present form, while remaining rooted in the past (Hill, 2021). Consequently "mauri includes the resource value of the ecosystem, recognizing that sustainable human use is an acceptable and intrinsic part of its value" (Hill, 2021; 233). In that way, restoring and preserving the mauri of a certain place should be a central aspect of environmental management, as seen by Māori.

The theoretical value of whakapapa is further expressed by Stewart (2020; 59) as she claims that it "provides an ethical framework based on kinship with/in the world…on ethical concepts of ecology and community". That is due to the connectedness of all that is living, whereas there is no separation between the environment and humans, as interactions are multi-leveled and surpass our sensory abilities. That is supported by Hill (2021; 188), "whenua (land or placenta) is the foundation of our existence and is the center of all Māori whakapapa, connecting bloodlines of people, place and landscape". Hence, while whakapapa is the central concept of Māori ontology, the land is the starting point of Māori philosophical thought, thus the importance of Tino rangatiratanga in relation to Taonga. However, as mentioned above, the land (or the landscape) is ever-changing, and as it evolves, so does the understanding of it. That falls in line with Māori's view on time – that is seen as cyclical, rather than linear as illustrated by the West (Stewart, 2020). Hence, whakapapa is represented through a spiral form – the double helix shape resembling the shape of the DNA molecule (Stewart, 2020, Hill, 2021). The primal dichotomies of this shape are taiao and *hinengaro* (mind) (Stewart, 2020, 87), which are integral to Māori philosophy. In this way, humans are a part of nature, not superior to it, the environment in itself is living and not a resource to be used. In te reo Māori, concepts have broad meanings, and care for the environment is built into it, thus there is no exact English translation of the above-mentioned terms.

Stewart points out that the related Western terms such as resource, interest, sustainability, and management are "being tied to monetary profit in economistic thinking" (2020, 89). That perception will be further analyzed in the next chapter of this thesis. Many

scholars call for the need to integrate Indigenous knowledge within the Western scientific sector as they "are interconnected by channel threads, creating points of convergence that enrich shared outcomes" (Hill, 2021, 246). As seen throughout the text, the two streams of knowledge – the Indigenous and the Western one - share similarities, and a potential to complement and expand on each other. The He Awa Whiria theoretical model enables us to integrate those approaches within academic research, and thus reproduce a new knowledge of environmental management that for the health of our planet, we (as a societal whole) seem to be in dire need of. While Mātauranga describes the core principles of the Māori worldview, *mātauranga-ā-iwi* provides us with an iwi-focused mātauranga, which shapes in consideration to the environment that the specific iwi lives in accordance with. Subsequently, for the purposes of this thesis, the next section is focused on Ngāi Tahu's environmental approach and ethics.

3.2. Kaitiakitanga

The concept of *Ki Uta Ki Tai* – from mountains to the sea, also known as the He Awa Whiria approach, is strongly advocated for by Ngāi Tahu (Crow et al., 2020). Living with such a dynamic environment, shaped the relationship of Ngāi Tahu with taiao, in connection with the changes in landscape. While Ngāi Tahu shares the core concepts of Mātauranga with iwi across Aotearoa, some practices are specific to them, as they derive from certain aspects of the environment found only on Te Wai Pounamu. The concept of kaitiakitanga is generally understood as guardianship, although as with the other Māori terms, its English translation is limited. Thus, it refers to environmental protection, management, and care, viewed through the connectedness of humans with nature, rather than dominion over it (Stewart, 2020). Kaitiakitanga is the closest Māori term to the Western understanding of environmental management, and as such, it is closely examined in the following paragraph of this thesis.

3.2.1. Ngāi Tahu Kaitiakitanga

Māori have developed environmental approaches by carefully observing and interacting with nature for generations. That same applies to Ngāi Tahu who adjusted to the conditions of the South Island and learned how to manage the resources available. They developed a complex system that included the preservation of the gathered supplies through storage, enabling them to prosper throughout the year (Williams, 2012). The places where the food was stored were called mahinga kai, as explained in the historical chapter, while *rauiri* "refers to isolated food

preserves to which a particular descent group has sole rights" (Williams, 2012; 96). Moreover, the right to make decisions about the distribution of resources is referred to as *mana whenua* whereas Manawhenua are "those who exercise mana whenua" (Williams, 2012; 90). However, it was not necessary to play a part in decision-making as it was understood that the efforts of those engaged in the collective work (*ohu*) would ultimately be rewarded (Williams, 2012). In that fashion, the term *kaihaukai* is understood as the ritual exchange of food, through specific areas of use (*wakawaka*), in a reciprocal manner (Williams, 2012). While such means of control can be seen as solely practical, they developed through spiritual considerations and thus, transcend the pragmatic aspect, forming a sustainable environmental management system.

The methods of harvesting are a further testament to that, as they were conducted in consideration of a resource, animal's habitat, and observation of plant species (Williams, 2012). To understand the biorhythm of nature, Māori developed a calendar called *maramataka,* a dynamic system influenced by the changes in the environment to which it was found necessary to adjust (Hikuroa, 2017). Subsequently, "seafood gathering areas were termed mära" (Williams, 2012; 93), as per the careful observation of the shellfish beds, Ngāi Tahu developed a system that enhanced their growth. Holes in pöhä (bags made of kelp) accounted for population improvement of the shellfish beds, and the pattern of the holes indicated the whanau who held the authority of the specific pöhä (Williams, 2012). The practices of habitat enhancement were extensive - often mimicking natural methods aiding in ecological advancement (Williams, 2012). The practice of lagoon-flushing at a river's creek - as a pollution-disposal practice influencing the abundance of fish, has been recognized by the West and implemented since the 1990s (Williams, 2012). Additionally, various forms of restrictions are made for ways of assuring the sustainability of natural resources. Hence, *rähui* was a temporal restriction to allow for the regeneration of a resource, and *Owheo* was a permanent one to conserve the land or water in its natural state (Williams, 2012). Williams (2012) argues that these restrictions surpass spiritual considerations, as they are a cause of one's understanding of the environment.

Ngāi Tahu environmental kaitiakitanga is understood through a physical and meta-psychical level, as well as the overarching concept of Mātauranga Māori. That is supported by Williams (2012; 100) who argues that:

> *"On the metaphysical level, it refers to the various ways in which atua are manifest to support the present generation; each atua being seen to have its own area of concern. On the practical level, the practice of kaitiakitanga requires the Manawhenua linked with resources in a particular locality, to mirror the kaitiakitanga of atua for the good of the entire descent group"*

Atua in te reo Māori means God (Te Aka Māori Dictionary, n.d.), therefore the underlying essence of kaitiakitanga is the connectedness between humans and nature, past, present, and future generations. Many of these concepts are shared amongst Māori and can be found within historical and contemporary practices of iwi on the North Island as well. However, taking into account the ecological distinctiveness of the South Island, some practices were enforced more by Ngāi Tahu than others, such as the concepts of kaihaukai and pöhä. Respect for natural resources, discouragement of predators, and sustainable practices are at the center of Ngāi Tahu's environmental kaitiaki (Williams, 2012). While sustainability plays a focal part within this environmental approach, the concept of kaitiakitanga embodies human responsibility towards nature, through the perspective of humans acting as guardians.

3.2. Ethical Pluralism

The literature on biodiversity conservation, biosecurity, and theories alike is as extensive as the views and perceptions on nature are. Globally and locally, discourse on nature conservation is intricate as it diversifies in accordance with one's background, carrying ideologies and values through different forms of expression that ultimately lead to the relationship one establishes with nature. Those forms of expression can be conveyed through policies and public discourse encouraged by a government, through narratives shared in a community, through an academic field of studies, or others. On a linguistic level, the current dominance of English in nature discourse is limiting, as ecological knowledge has mostly been produced in native tongues (Trisos, Auerbach & Katti, 2021). Thus, to work towards the inclusion of marginalized communities, we need to embrace realities that come from different sets of knowledge and through their language (Trisos, Auerbach & Katti, 2021). Searching for the Western-based theory to use in this study has led me back to the original Wai 262 claim, in which the claimants requested their inclusion in eco-ethno ethics (Wai 262, 1991). Although the concept as such is not used three decades later, I found ethical pluralism to be a suitable theory choice as an inspiration for this study.

Ethical pluralism is chosen as an attempt to “move beyond theoretical debates seeking the single best ethical theory and focus on ethical diversity as a common source of possible solutions” (Cortes-Capano et al., 2022; 2). It is grounded in the recognition that knowledge is not singular, therefore, to attempt to draw solutions from one stream of knowledge is unjust as the ethics on biodiversity require integration. National parks as areas significant to Indigenous peoples carry a colonial nature, being primarily managed by the state. Therefore, to work towards decolonization is to strive towards the inclusion of Indigenous peoples in the development of environmental frameworks and practices (Trisos, Auerbach & Katti, 2021). There are multiple ways of comprehending right from wrong, hence “ensuring recognition and inclusiveness through a human needs and capabilities approach can provide a basis for addressing ethical pluralism by providing criteria for justifying or rejecting the competing claims" (Cortes-Capano et al., 2022; 4). Considering the abundance of dilemmas and controversies around the Predator Free movement, I argue that ethical pluralism is compatible with the Braided Rivers approach, as understood from an Indigenous perspective.

While the Māori concept of kaitiakitanga is translated in the English language as stewardship or guardianship, similar views on nature can be found within the Western discourse. Robison argues that conservationists share the same perception of responsibility to act as guardians and that Indigenous peoples are inherently conservationists and as such, the primary stewards of nature (2010; 959). Along with being the ones who interacted with nature in extensive ways creating the basis for environmental management, their indisputable right to traditionally populated land is recognized in the UN Declaration on the Rights of Indigenous Peoples (UNDRIP, 2007). Hence, Indigenous peoples’ knowledge is not only essential but the states that adopted UNDRIP (such as Aotearoa) are legally bound to incorporate it in building contemporary environmental practices or conducting activities on said lands. Ethical pluralism takes into consideration multitudinous discourses on nature, seeing how choices on nature conservation are context-specific, as they include different actors carrying diverse sets of values and ontologies (Robinson, 2010). Drawing from the Mt Aspiring NP Management plan in which particular places are recognized for their intrinsic value (Dart and Rees River, including Route Burn), as well as from the concept of mauri that encompasses the resource value of the ecosystem, value-based ecological practices are the drivers of pluralistic approach in Western, and arguably Indigenous context too.

Moreover, intrinsic values are “essential for nature conservation and reflect the motivation of environmental activists and scientists” (Himes & Muraca, 2018; 3). Such values are incentives for ethical pluralism conservation practices due to their incommensurable characteristics, untied to the human benefit (Robinson, 2010). Language is an additional focal point in relation to our attitudes and ontological perspectives on nature (Robinson, 2010). Hence, this study strives towards simultaneous usage of both Māori and English language, as a way to illustrate the ontological discourse around environmental management. To limit what is real, through either denial of the perceived reality or the form of its expression, is to limit potential reform, both in policymaking and practices (Moon & Pérez-Hämmerle, 2022). Another value of nature comes from human dependence on nature and its resources, recognizing its contribution to matters such as global poverty (Robinson, 2010). While value-based ideologies are numerous and complex, recognizing the plurality of them is the only way to overcome those intricacies.

Change is inevitable, knowledge is ever transforming, and it shapes according to external circumstances and through time. Shift in the cultural framework has historically been expressed through suppression, necessitating amendment through contemporary inclusion. As stated in the Wai 262, the claim moves beyond the historical grievances into the period of transformation and modification of contemporary regulations. Integrative pluralism calls for two-sided, equitable hybridization of different streams of knowledge, recognizing that such an approach is suitable for solving perplexing phenomena (Caniglia et al., 2021). It is focused on collaboration, rather than imposition, recognizing that it might never lead to a singular solution, operational on all levels, as it is shaped through action and interactions, moving within the educational process of comprehending various streams of knowledge and ways of knowing (Caniglia et al., 2021). As Euro-centric approaches on conservation have historically been the dominant practice, the importance of ethical pluralism lies in the awareness that to favor one stream of knowledge, or an action is to limit the development of biodiversity conservation (Caniglia et al., 2021).

Considering the colonial history of national parks, embedding Indigenous knowledge in ecological management is to ensure realization of the basic human rights (Trisos, Auerbach & Katti, 2021). Pascual et al. (2021) states that taking accountability for the actions that led (and are still potentially leading) to biodiversity loss and for limiting the self-determination of

Indigenous peoples is the first step towards reformation and alliance. Realities are essentially normative, yet multitudinous as they are actor-specific and context-specific, thus historical and ontological accountability is necessary to understand the interdisciplinary nature of environmental management, in connection to Indigenous communities and biosecurity methods. Ethical pluralism is then used "to navigate between different ontological and epistemological positions as a means to foster interdisciplinary engagement between organizations promoting environmental sustainability while accounting for what is important to people" (Rawluk et al., 2018; 1188). What is important to people hereof encompasses all of Aotearoa's inhabitants, not only certain groups.

In the continuation of this study, I analyze the interdisciplinary approaches to conservation strategies through the examination of official documents, biosecurity methods, and their implications on Taonga. While the founding documents, such as UNDRIP, ICCPR, and Te Tiriti in Aotearoa's context in theory ensure the practice of sovereignty and unqualified chieftainship of Māori, historical mores have so far arguably failed in the execution of these rights. That is supported by continuous power struggles expressed through the Wai 262 claim, or others mentioned below. In consideration of that, "empowerment might not be possible within existing structures, thus requiring a commitment to structural plasticity or reform" (Moon & Pérez-Hämmerle, 2022; 9). The analysis seeks to investigate to what extent are the conceptual frameworks of hybridization of different streams of knowledge - He Awa Whiria, embedded in the existing regulations and practices.

4. Analysis and findings within the Tititea region

The analysis chapter is divided into two main parts – with the first focused on conservation descriptors as found in the four chosen relevant governmental documentation: Aotearoa NZ Biodiversity Strategy, Otago Conservation Management Strategies, Mt Aspiring National Park Management Plan, and Predator Free 2050. The reasoning behind choosing those documents has been elaborated above in the methods chapter. The second part of the analysis chapter is centered around the predator eradication methods as found through both primary and secondary sources: trapping techniques, their distribution within the Otago area, and toxins usage/disposal within Mt Aspiring NP.

This way of analysis allows me to examine the implementation of Māori and Western streams of knowledge within environmental management policies, that led to utilization of predator eradication measures. It furthermore mirrors the hierarchical structure of Aotearoa's governmental bodies and policies. This means that as documents are drafted in accordance with other over-arching documents, and local policies draw definitions from regional and national ones, the structure of the analysis reflects the system producing predator eradication measures. Predator control methods are designed in connection with the prevalent conservation and biosecurity thought in Aotearoa. To fully comprehend the inclusion of Māori philosophical thought within the implemented predator eradication methods, it is necessary to assess the concepts surrounding those measures.

4.1. Conservation descriptors in governmental documentation

Predator control is tied to many concepts and terms, as it is a conservation method that revolves around the discourse on the preservation of biodiversity and sustainability. As shown in the theoretical chapter, views on environmental management differ in consideration of ontological perspectives – people's reality is real to them. Stewart (2020; 35/36) argues that what all Māori living in contemporary New Zealand share are "unique origin stories and histories, which are fundamentally different from those of white or settler New Zealanders, known as Pākehā". Distinct histories reflect on the creation of plural practices and beliefs, that are likely to produce improved sets of values if joined equitably. However, Western dominance prevailed in the creation of past policies, followed by the application of such practices.

Therefore, I begin this analysis from the basis, of investigating the ways in which Māori knowledge is used, and to what extent, in both theory and practice in relation to the predator eradication methods. The basis in this context is to examine conservation descriptors used, both those of Māori and Western character, within the underlying governmental documentation. Conservation descriptors crucial for understanding the topic of predator control are the ones surrounding the discourse of biodiversity preservation: environmental management, ecosystem, biodiversity, indigenous (and non-indigenous) species, biosecurity, conservation, sustainability, protection, and the concepts alike. Furthermore, I am searching for, and examining the usage of the concepts of mātauranga, kaitiakitanga, whakapapa, mauri, taiao, mana whenua, and other Māori terms relating to Ngāi Tahu and their environmental ethics to examine the plural nature of official documentation.

Lastly, when analyzing the Otago Conservation Management Strategies (CMS) and the Mt Aspiring National Park Management Plan (the Plan), I am moving towards the findings, beyond the categorical search for concepts and analysis of the indicated. That is done due to these policies using te reo Māori, mostly on a linguistical level (place names and translations) rather than on a conceptual one. The above-mentioned notions, such as kaitiakitanga, mātauranga, mauri, Taonga, whakapapa, and others alike are used in connection to Te Tiriti partnership, under a separate category within the documentation. There is no further mention of those terms throughout CMS and the Plan. Apart from using Māori concepts under Te Tiriti partnership column, Appendix 13 within CMS features Ngāi Tahu Claims Settlement Act 1998 provisions relating to Otago, describing Ngāi Tahu values in connection to defined Töpuni areas (DOC, 2023). A similar Appendix can be found in the Plan (Appendix 4), identifying Ngāi Tahu Settlement Protocols (DOC, 2011). While in the former, there is a greater focus on Māori ontology through Ngāi Tahu historical usage of Töpuni, the latter uses the Appendix to define operational strategies in connection to Ngāi Tahu. Thus, the analysis of those policies is approached and structured slightly differently than the analysis of the Biodiversity and the Predator Free strategy.

4.1.1. Te Mana o te Taiao - Aotearoa New Zealand Biodiversity Strategy 2020 (ANZBS)

The current policies and methods related to environmental management are complex, insomuch as they are constructed by many different governmental documents and Acts. That requires a great command of value-based, actor, and context-based approaches to management, giving respect to varied ontologies through plurality. There are many players involved in the biodiversity system, as stated in the ANZBS as follows:

> *"Whānau, hapū, iwi, Māori organizations, and Treaty partners… Members of society, [..], kaitiaki rōpū (conservation guardianship groups), landowners, and environmental organisations […] Industry […] Government and statutory bodies[…], Land Information New Zealand, New Zealand Fish and Game Council, Game Animal Council, Māori statutory bodies and Treaty settlement entities… Local government […]"* (DOC, 2020; 22).

Although the diversity and inclusion of the range of actors could aid in braiding the rivers of knowledge and application of ethical pluralism, the wide scope of agencies and individuals involved in this process could also result in a lack of accountability (DOC, 2020). To bridge the gap between all those players requires an interconnection that binds them together, moving beyond the historically dominant Eurocentric structures of knowledge into plurality.

The ANZBS strategy aims to create that kinship by giving respect to Te Tiriti as well as implementing Māori philosophical thought within the policy, which is presented as guiding values. Those include kaitiakitanga, mahi whaipainga, ngākaunui, mahi tahi, whakapapa, tohungatanga and manaakitanga (DOC, 2020; 44). While the meanings of kaitiakitanga and whakapapa are elaborated above in the theoretical chapter, *mahi whaipainga* refers to care for nature, *ngākaunui* is directly translated as enthusiasm, *mahi tahi* as collaboration, *tohungatanga* means competence, and lastly, *manaakitanga* loose translation would be hospitality, however, in this strategy it is applied as building trust and inclusiveness (DOC, 2020). Guiding values are thus seen through their intrinsic value as all these concepts refer to the incommensurable worth of conservation. Usage of te reo Māori within the policy further demonstrates the understanding of how one's language influences reality and the relations created.

Moreover, the concept of biodiversity is used "to refer to biological diversity and 'nature' when considering the wider processes, functions, and connections in the natural environment, of which biodiversity is a part" (DOC, 2020; 7), in which nature stands as a holistic term that sees the environment and people as interconnected. That vision, of interdependence between nature and humans is the central aspect of the creation of the ANZBS, as it is within conservationist thought and Māori ontology, as seen through Mātauranga. Further regard to Mātauranga is given by applying the He Awa Whiria approach as a foundation of the biodiversity strategy and by "developing Te Pae Tawhiti, an all-of-government approach to address the issues raised by the WAI 262 claim and the Waitangi Tribunal report Ko Aotearoa Tēnei" (DOC, 2020; 40). *Ko Aotearoa Tēnei* (This is Aotearoa) is the report referring to the Wai 262 claim, addressing the work of all governmental bodies throughout Aotearoa, and ways in which to develop a partnership with Māori and move past the period of grievances (waitangitribunal.govt.nz, n.d.). Using those plural methods in the official governmental policy indicates that the Crown is acting in good faith, following the obligation to incorporate the Wai 262 ruling to advance the protection of Taonga for all New Zealanders.

The issue of biodiversity loss is addressed through reference to Papatūānuku, Ranginui, and their offspring (DOC, 2020), further straightening the implementation of Māori philosophical thought, and working towards acknowledging differing realities. Alongside the Te Tiriti partnership and the Wai 262 ruling, the stewardship principles of the AZBNS are *Intergenerational equity, Creating change,* and *Intrinsic value* (DOC, 2020). The same principles are found within Mātauranga and ethical pluralism, as they demonstrate moving towards decolonization, through the integration of multiple knowledge systems to enable innovation. Thus, integrated implementation approaches within the ANZBS are Ki uta ki tai – from mountains to the sea, as explained in the theoretical chapter, and the notion of *Ecologically sustainable use*. Ecologically sustainable use means to prioritize biological diversity, while conducting activities that do not harm it, e.g. are sustainable (DOC, 2020). To use both as implemented methods is to directly apply the He Awa Whiria and the fusion of Indigenous and Western approaches to the policy. Furthermore, the ANZBS draws the definition of sustainability from the Convention on Biological Diversity (CBD) and is accordingly characterized as "the use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations" (CBD cited in DOC, 2020;

63). Arguably, the concept of mauri in its widest terms, whereas human sustainable use makes for a recourse value of the ecosystem, can be seen as a similar perception.

In continuation, preserving and advancing biological diversity requires the protection of species, which are divided into three categories – indigenous species, non-indigenous species and valued introduced species (DOC, 2020). Indigenous species are the ones native to NZ, introduced species refer to the species brought to NZ intentionally or unintentionally, and lastly the valued introduced species "are introduced species, including sports fish, game animals and species introduced for biocontrol, which provide recreational, economic, environmental or cultural benefits to society" (DOC, 2020; 9). That could support Stewart's argument in terms of dominant economic values that stereotypical Western views apply to nature. Moreover, going back to the historical chapter, many predators have been brought to Aotearoa to manage the previously introduced pests. Hence, the valued species have the potential to become predators if not managed properly (DOC, 2020). Subsequently, 10 spy wallabies, also considered pests, have recently been released in two Otago districts, expected to lead to other wallabies, in order to extract them from the Otago region (Srinivasa, 2023). While the newspaper article acclaims this predator control method, such actions historically led to an unwanted outcome, being the increase of pests. Contemporary and continuous application of those methods can, therefore, be considered risky at least.

Nevertheless, the release of wallabies is seen as a method of biocontrol, which is in the strategy synonymous with biosecurity, which has been defined as "the exclusion, eradication or management of pests and diseases that pose a risk to the economy, environment, or cultural or social values, including human health" (DOC, 2020; 60). The wallabies example demonstrates that the inclusion of pests can be a part of the exclusion of them. Predators such as possums are carriers of bovine TB, however, toxins too have implications for ecological and human well-being. In the areas where the toxins are used, DOC placed red/white metal boards titled 'DANGER POISON', featuring skull and crossbones – as the universal sign for poison (as seen by the Dart River, on the Routeburn Rd). The text under the title informs the public about the type of toxin used, it warns not to touch the bait, to watch children at all times, not to eat animals from the area, and that the bait or a by-kill can have lethal consequences to dogs (as seen by the Dart River, on the Routeburn Rd). A sign like that was seen close to the Ngāi Tahu sheep farm next to the southern end of the park, approaching the park from Kinloch.

Hence, 1080 poison, PAPP, and brodifacoum can pose a risk to human and environmental health, as supported by the Material Data Sheet and many warning signs seen in and around Mt Aspiring NP. Considering the contradictory nature of biosecurity practices and DOC's statements, it can be argued that some of these environmental approaches to biodiversity protection are what led to its decline and what could pose a risk to Taonga.

Lastly, the ecosystem within Māori ontology encompasses physical and meta-physical aspects of the world. The stereotypically Western views differ as they are taking into consideration only the physical aspect, as supported by the following definition of ecosystem described as "a community of plants, animals, and microorganisms in a particular place or area interacting with the non-living components of their environment (e.g. air, water, and mineral soil)" (DOC, 2020; 61). While referring to Papatūānuku, Ranginui, and their offspring as an ecosystem in parts of the strategy, this definition is rooted in Western ontology whereby nature consists of its tangible aspect, in contrast to Māori construct of the world in which the ecosystem comprises the spiritual world and its entities. Those realities do not necessarily cancel each other out, but using such interpretation as an ideological foundation can be seen as indicating the dominance of the Western thought that oftentimes prevails in official policies, hence contributing to the continuous marginalization of Indigenous knowledge. While throughout this strategy, there is a visible effort from the Aotearoa's government to give respect to Māori ontology, the applied practices are further required to follow regional, and locally focused policies. That brings us to the next-in-line governmental policy, directed more narrowly at the management practices within the Otago region.

4.1.2. Otago Conservation Management Strategies (CMS)

Conservation Management Strategies (CMS) are regional strategies integrated within a specific geographical area that give effect to the *Conservation Act 1987* and the *Conservation General Policy 2005* (DOC, 2023). The concept of conservation is characterized at the beginning of the policy, and in accordance with the Conservation Act as "preservation and protection of natural and historic resources for the purpose of maintaining their intrinsic values, providing for their appreciation and recreational enjoyment by the public, and safeguarding the options of future generations" (DOC, 2022; 16). Thus the value given is aligned with Mātauranga and ethical pluralism principles. Moreover, the CMS draws the definition of this

concept from the Conservation General Policy 2005 and interprets preservation through the same notion of intrinsic values.

The concept of nature conservation is giving “special regard to indigenous flora and fauna, natural ecosystems, and landscape” (DOC, 2022; 16). A natural ecosystem is seen through the same lens as within the ANZBS, debatably favoring the conceptualization of Western reality, while indigenous flora and fauna are interpreted as native to Aotearoa, prior to human occupation (DOC, 2023). There are several thousand indigenous species in the Otago region and have accordingly been divided into threatened and at-risk species (DOC, 2023). Those include various bird species, regarded as Taonga, such as “kea, mohua/yellowhead, tōrea pango/variable oystercatcher, tōrea/ South Island pied oystercatcher and scarlet mistletoe” (DOC, 2023; 46). In consideration of their habitat within Mt Aspiring NP, this policy has defined three priority ecosystem units – where conservation work is seen as the most effective considering the protection of ecosystems and indigenous flora and fauna (DOC, 2023). The priority ecosystem units within the NP are Pyke Valley, Arawhata-Waipara, and Red Mountain (DOC, 2023; 46), with many more outside the park borders, some of which are granted Töpuni status. Granting Töpuni status could be seen as directly practicing the Braided Rivers approach and embracing the plurality, however, its just integrity is debatable as the status does not override the NP principles.

Governance of Töpuni areas is in co-management as the Minister of Conservation has the obligation to give greater regard to advice made by Te Rünanga o Ngāi Tahu (Ngāi Tahu tribal council) when drafting new policies affecting Töpuni sites (DOC, 2023). There are five sites within this policy; Pikirakatahi (Mount Earnslaw), Tititea (Mount Aspiring), Te Koroka (Dart/Slipstream), Maukaatua Scenic Reserve, and Matakaea (Shag Point) (DOC, 2023; 26). Further, Te Koroka is given the status of Specially Protected Area, due to its “archaeological, historical and geological significance” (DOC, 2011; 52), particularly the protection of pounamu (greenstone). For any member of the public to enter the area, including Ngāi Tahu whenua, requires a permit, which is given by DOC in agreement with Te Runanga o Ngāi Tahu (DOC, 2011). Moreover, the CMS acclaims Ngāi Tahu’s historical and cultural significance of “Lakes Wakatipu, (Whakatipu wai-Maori), Wanaka and Hawea, with Manuhaea Conservation Area at The Neck being one of the most significant sites" (DOC, 2023; 58). Having previous knowledge about The Neck’s importance to Ngāi Tahu, the lack of any information found about their

relationship with the landscape during the fieldwork was a surprising factor. As stated in the Plan, Ngāi Tahu has the right to publicly disclose or to hide the relevance of a certain place, in order to protect it from the public gaze (DOC, 2011). That might be the case with this site, as the historical presence of Ngāi Tahu is made known by various educational panels alongside the Wanaka Millennium Walkway.

However, information found while observing the Hawea River Track is largely directed at informing the public about the indigenous flora and fauna and means of their protection, rather than any historical or contemporary importance of Ngāi Tahu to the site. The only mention of Māori throughout the River Track has been found on a single post along the track, stating that by the time of European settlement, there were a few Māori living in the area, thus the land was seen as unoccupied and suitable for European farming (as seen on the Hawea River track). There is no toxin distribution adjacent to Hawea Lake, as predator control is conducted through the trapping of rats, stoats, ferrets, hedgehogs, and weasels (as seen on the Hawea River track). There are many informative panels on the types of indigenous species in the area, sometimes presented in connection to their importance to Māori, such as kanuka woodland. The remaining panels showcase the projects aimed at protecting biodiversity in the area, such as the Guardians of Lake Hawea – sub-committee of the Hawea Community Association (as seen on the Hawea River track). To use the term guardians is to apply Indigenous terminology to nature conservation through the principles of Matauranga and ethical pluralism.

Lastly, protection within the CMS applies to the preservation of the resource in its current state, restoration, or enhancement (DOC, 2023). The means of conducting such activities derive from drafting the CMS, which is broken down into five phases. The current CMS has been in use since 2016, reviewed in 2022 following the Waitangi tribunal ruling, and published in 2023. Each phase of drafting includes consultation with Te Tiriti partners (as the policy gives effect to the Treaty), in addition to DOC and Conservation Board, extending to New Zealand Conservation Authority, key stakeholders, hearing panel, and the general public in some of the phases (doc.govt.nz, n.d.). Protection of biodiversity is directly connected to the concept of biosecurity, which has been defined in accordance with the ANZBS's concept of the same. As stated within the CMS, one of the biggest challenges within the Otago area, and Mt Aspiring region specifically, are predators and pests (DOC, 2023). Taking into account the policy's attestation of recognition of kaitiakitanga and Ngāi Tahu's contribution to protecting

biodiversity (DOC, 2023), to further analyze the extent of those in practical terms, I am diving more deeply into the analysis of Mt Aspiring NP Management Plan in continuation of this chapter.

4.1.3. Mt Aspiring National Park Management Plan

The Mt Aspiring National Park Management Plan (the Plan) has been developed in consideration of the above-described Otago CMS and General Policy for National Parks 2005 (DOC, 2011). It was approved in 2011, and as per each governmental document, it is to be reviewed after 10 years of approval, albeit there is no available reviewed version of the plan to this date. Thus, this version of the Plan will be used for the purposes of the thesis. The lack of revision, especially following the obligation to incorporate values of Wai 262 ruling within the official policies, can be attributed to budgeting issues, lack of accountability by governmental agencies, or others. Nevertheless, as the Wai 262 is considered a flora and fauna claim, thus directly connected to national parks as biodiversity hotspots, the revision of the Plan is by all means overdue.

As all the other official documentation mentioned in this chapter, this policy has given effect to the principles of Te Tiriti, therefore "the special connection that tangata whenua have with the park's lands and waters is recognized" (DOC, 2011; 23). However, if the principles of the Treaty conflict with hierarchically superior acts, such as CMS, or General Policy for NP, those provisions will override Te Tiriti principles (DOC, 2011). Arguably showcasing the superiority of the Western stream of knowledge through reinforcing governmental policies above the Treaty partnership, opposing the ethical pluralist approach. Additionally, the concepts of conservation, protection, ecosystem, and preservation all follow the principles defined under the Conservation Act. Due to one of the objectives of the park management plan being the protection of indigenous flora and fauna (as seen through CMS), gathering indigenous plants or animals within the park must be authorized and non-conflicting with the management plan (DOC, 2011). That puts limitations to Ngāi Tahu customary use as gathering has historically played a key role in the usage of the area. Especially considering the sustainable management practices of Ngāi Tahu that evolved through time. Subsequently, the general policy states that the traditional use can be conducted on a case-to-case basis if consistent with

the relevant Acts, supported by tangata whenua, and ultimately permitted by the Minister of Conservation (DOC, 2011).

To ensure Ngāi Tahu's participation in policymaking, and their role as kaitiaki within the Mt Aspiring area, one of the policies of the Plan is to "actively consult and work with papatipu rūnanga and also, where appropriate, with Te Rūnanga o Ngāi Tahu from the early stages of proposals that may affect Ngāi Tahu values" (DOC, 2011; 25). Papatipu rūnanga is a council under Te Rūnanga o Ngāi Tahu, solely representing the tangata whenua of Tititea NP (DOC, 2011). Furthermore, consultation with papatipu rūnanga is also required when managing indigenous plants and animals defined as Taonga, in Töpuni areas or where Deeds of Recognition apply (DOC, 2011). The obligation to consult can be seen as an effort to bind two ontologies together and practice interdisciplinary engagement. However, while there is an inclusion of Ngāi Tahu through necessary consultations and obligations through Te Tiriti partnership, the Minister of Conservation and Aotearoa's government have the final word. Furthermore, biological diversity in Mt Aspiring NP Management Plan draws from the United Nations Conference on Environment and Development 1992 and is therefore defined as "the variability among living organisms from all sources, including terrestrial, marine and other aquatic ecosystems and ecological complexes of which they are part. This includes diversity within species, between species, and of ecosystems" (United Nations Conference on Environment and Development 1992 cited in DOC, 2011; 128). To use the interpretation of biological diversity as seen over three decades ago puts limitations on the changing discourse around the concept of conservation and therefore, the strategies on biosecurity and unbiased integration of knowledge.

The Plan features a separate category of species - Taonga species, defined as "any birds plants, and animals described in Schedule 97 of the Ngāi Tahu Claims Settlement Act 1998 found within the claim area" (DOC, 2011; 132). The exclusion of Taonga species not defined within the Settlement Act can be seen as an additional limitation of the Plan and constriction of tino rangatiratanga. Moreover, particular areas in the park have a significant biodiversity value, such as Dart Catchment, Makarora area and around the Young Valley, and Haast Tokoeka Kiwi Sanctuary (DOC, 2011). Dart Catchment includes Dart Valley, Route Burn, and Route Burn Valleys, whereas Route Burn is the only Great Walk (walks considered the most spectacular ones in the country) in the NP. There are only 10 Great Walks in the country and are highly

advertised on DOC sites and visitor centers. The estimated yearly number of visitors is up to 10 000 that are predicted to "burn seven tonnes of coal and 2000 kg of gas, use nearly 3000 rolls of toilet paper" (Grzelewski, n.d.). Although the Plan states that it is "largely unaffected by increasing recreational and tourism use" (DOC, 2011; 18), such high numbers of visitors are unlikely to have zero effect on the landscape. The concept of conservation management in this Plan "includes the department's hut and track servicing, species and habitat protection, introduced animal and weed control, monitoring and historical and cultural heritage work and may include authorized research and monitoring that is for the benefit of the park or conservation generally" (DOC, 2011; 129). This definition implies large budgeting which DOC is in dire need of.

While conducting the fieldwork, I learned that the visitor center in Makarora has been closed due to budgeting, as well as the Blue Pools and the Rob Roy's bridges, which have been closed since May 2023. They were both projected to open by this date, however, at the time of writing (May 2024), the bridges remain closed with no allocated opening date. In the Plan from 2011, it is indicated that the Blue Pools bridge is planned for an upgrade, thus the required budgeting is hardly shocking news. The Blue Pools bridge is the only way to access the Young Valley, other than the river crossing. The danger of crossing the Makarora River is pointed out both in the visitor center (that is open for entry with no authorized personnel inside), and next to the river itself. It clearly states that many trampers have drowned trying to cross the river, while the locals argue that the number has gotten higher since DOC closed the visitor center. Therefore, the extensive conservation management methods as defined by the Plan seem too difficult to obtain in practice. To understand how conservation management is done regarding pest control, I am looking into the current predator control methods and their implications within Töpuni, and in connection with Taonga species. That leads us to the newly created Predator Free New Zealand 2050, which came into effect in 2020 and was drafted in 2019, prior to the final Wai 262 ruling.

4.1.4. Predator Free 2050 (PF50)

Predator Free 2050 is a program that aims to eliminate the predators in Aotearoa by the year 2050, as the title suggests. It is a part of the large discourse on predator-free movement, in which DOC plays one of the key roles as the initiator of the PFNZ. As a movement, it includes

over 30 organizations, such as The Predator Free NZ Trust, Predator Free 2050 Limited, Zero Invasive Predators Ltd, community members, NGOs, Sanctuaries, Universities, and others (doc.govt.nz, n.d.). Considering the limitations of this thesis, I will focus mainly on the Predator Free 2050 strategy and its views on the environmental management methods related to pest control. Additionally, I will be using the *PFNZ: Social, Cultural and Ethical Challenges policy* created by the Bioethics panel as supporting documentation for this part of the analysis chapter. As a part of the movement, DOC initiated a program called *'The Battle for Our Birds'* (DOC, 2016), and is often referring to the PF movement as the war on pests (doc.govt.nz, n.d.). Alongside using concepts such as eradication, the discourse on war urged by DOC can be seen as endorsing a certain ideology that can influence the relationship one associates with nature (Morris, 2019).

The PFNZ is focused on the eradication of, what they consider three types of most damaging predators – mustelids (stoats, ferrets, and weasels), rats (ship rats, Norway rats, and kiore), and possums (PFNZ, 2020). Kiore is however, regarded as Taonga for some iwi (Bioethics panel, 2019; PFNZ, 2020), which both documents recognize, but do not further elaborate on ways of approaching that matter. Through additional research, I have learned that consultations with the affected iwi are conducted when employing eradication methods on kiore (Haami, 2008). PFNZ is considered a tool to achieve the outcomes of The ANZBS strategy, seeing the protection of the country's Taonga as its main objective, giving the reference to Papatūānuku in connection to the ecosystem (PFNZ, 2020). Pointing out to deliberate linguistic use demonstrative of Māori ontology. However, the concepts of ecosystem, biodiversity, and other related terms are not clearly defined within this strategy. Interestingly enough, there are no mentions of poison usage either, or how they are planned to be implemented. The plan refers to *The Hazardous Substances and New Organisms Act 1996* (HSNO Act), as the leading policy document for eradication of pests. Drawing from the PFNZ: Social, Cultural and Ethical Challenges policy, it is argued that the opposition to using the 1080 toxin is to severely damage the goals of predator-free landscape (Bioethics panel, 2019). As seen through ethical pluralism, biodiversity conservation is contested due to the interplay of context and actors, hence the diversion of perspectives.

As 1080 is considered highly toxic, there are both societal and technological considerations when it comes to its usage. Application of such hazardous materials or any novel

tools in the field of biosecurity must utilize the previously mentioned HSNO Act (Bioethics panel, 2019). It is important to highlight that the HSNO Act does not give effect to the principles of Te Tiriti, thus strengthening the argument that integration is crucial at all levels of provisions. To backtrack to the PF 2050, it is stated that this policy is guided by the principles of "collaboration, connection, the environment at particular places, inclusivity, guardianship and responsibility, adaptability and courage" (PFNZ, 2020; 29). Collaboration refers to the need for everyone to work together to achieve the same goal, which is to maintain a connection to the bigger objective "flourishing biodiversity and improved wellbeing for New Zealanders" (PFNZ, 2020; 29). Inclusivity thus, attributes to practice including all groups with a wish to contribute to the advancement of biodiversity in Aotearoa, hereby stated as Taonga (PFNZ, 2020). That leads us to the principle of guardianship and responsibility defined as follows:

> *"Whānau, hapū and iwi have an obligation of kaitiakitanga, deriving from whakapapa, to care for indigenous plants and wildlife. Although only Māori can be kaitiaki, an ethic of 'wise stewardship' or guardianship also weaves through Western and other thinking. We need to embrace these dual responsibilities, to care for what makes New Zealand unique, as we work towards Predator Free 2050"* (PFNZ, 2020; 29).

The objective is aligned with the principles of ethical pluralism, as it encourages diversity with the same goal for all of Aotearoa's inhabitants. It further links the concept of kaitakitanga with the Western thinking, while recognizing Māori as the primary stewards of nature. In continuation, adaptability refers to following the learning curve, while courage means to dare to give effect to the current methods while acquiring new knowledge (PFNZ, 2020), both promoting advancement. It is stated that the PFNZ program is both a government-sponsored initiative and a social movement (Bioethics panel, 2019). As a social movement, it encompasses many actors and agencies working towards the same goal, however the means of achieving them may significantly differ – as per different ideologies. Thus, when drafting this document, the Bioethics panel of 12 academics, industry and community experts with diverse backgrounds have mapped out "the landscape of social, ethical and cultural considerations surrounding PFNZ" (Bioethics panel, 2019; 3). That is done in an effort to move away from the top-down policies, in which the knowledge is hierarchical as previously mentioned, mainly expressed through the superiority of the Western knowledge. It is argued that this document considers various ontologies in order to produce "ongoing, respectful, and substantially two-

way [interaction] rather than top-down" (Bioethics panel, 2019; 16). To accomplish such a goal, the PFNZ includes Māori and Western concepts, as separate and as intertwined together – encompassing plurality.

Therefore, the program gives effect to Te Tiriti and discusses Māori and Western values, both as opposed to each other, and as complimenting ideas. Subsequently, the concept of kaitiakitanga is elaborated on in relation to the Western concept of *Conservation philosophy*. It is argued that within Mātauranga, the value is placed on the relationships with the environment and our responsibility towards it, while the Western idea of conservation (Conservation philosophy) is more tightly tied to the idea that biodiversity is valuable, and therefore the actions to protect it are rationalized (Bioethics panel, 2019). Hence, the biggest difference between those ideas is where the value is placed – in terms of human dependance or distinct from it. Embracing those pluralities is to apply just union. To describe Māori's relationship with nature and its significance, the plan defines the concepts of whakapapa through mana, mauri, tupuna, whānau and manaakitanga, as te reo Māori concepts that shaped Māori ways of knowing. Justification for value in Western terms is plural, divided as intrinsic and extrinsic values. Extrinsic values include "economic gain, mental or physical health, or aesthetic appeal" (Bioethics panel, 2019; 10) and are often the main motivating factor for biosecurity. Although those concepts can be seen as opposed to each other, ethical pluralism demonstrates that embracing them can warrant the same objective.

Where we put the value in consideration to biodiversity is furthermore linked to animal welfare. While within Mātauranga, through the concepts of kaitiakitanga and manaakitanga, the connection is realized through all parts of the natural environment, moral consideration to animal ethics in the Western terms is often convoluted. That brings us to the last aspect of this part of the analysis – examination of moral agents and moral patients as Western views to animal welfare. Human beings are considered as moral agents when it comes to decision-making regarding our environment, which animals are a part of, while the concept of moral patients is dependent on the context and individual based (Bioethics panel, 2019). In holistic terms, moral patients make up for an extensive category of species, communities, ecosystem, and biosphere as a whole, as "something worth moral consideration, regardless of whether humans can derive some benefit from the services it provides" (Bioethics panel, 2019; 12). This perspective conforms with Mātauranga; however, it has been contested as Western views

oftentimes fall in line with commodification of a certain resource, to benefit humans or scientific sector (Bioethics panel, 2019). Thus, there has been a tension to prioritize environmental ethics above animal ethics, when it comes to ecosystem health versus lives of animals.

Some argue that to poison an animal can be morally superior to letting it die of starvation or be eaten by its predator (Bioethics panel, 2019). Such statements perceivably protrude poisoning as paramount to nature. Opposing arguments state that "causing unnecessary suffering would undermine the mana of the animals themselves, the relationships in which we stand with the animal, and subsequently our mana as kaitiaki" (Bioethics panel, 2019; 12). In other words – such an approach could be seen as opposing Mātauranga principles. The key to this dilemma is in this strategy presented by quick and (relatively) painless death, as the most effective and ethical solution (Bioethics panel, 2019). However, as it is further explained in the second part of the analysis chapter, these toxins do not provide a quick and painless death, rather it can take weeks for the poisoned animal to pass away (Kelly, 2020). As poisons used are highly toxic, only a small dosage can be (safely) distributed, leaving infected animals to suffer for longer periods. That brings us to the ending of this part of the analysis, into examination of properties of hazardous toxins used, their distribution, alongside usage of other biosecurity methods such as trapping.

4.2. Predator eradication methods

Predators that the Predator Free 2050 movement is focused on are mustelids (stoats, ferrets and weasels), rats (ship rats, Norway rats and kiore) and possums (PFNZ, 2020), also known as the 'Big Three'. Stoats pose a threat to kiwi chicks, as they prey on them, have a negative effect on birds that breed in tree trunks and are thought to have added to the extinction of South Island's "bush wren, the laughing owl and New Zealand thrush" (DOC, 2021; 7). Weasels are not considered as the biggest threat to Aotearoa's biodiversity; however they prey on eggs and pose a danger to imperiled Whiteaker's skink (a lizard) (DOC, 2021). In continuation, rats as omnivores are a menace to both native wildlife in terms of predation, and competition for food (DOC, 2021). Lastly, ferrets and possums carry bovine tuberculosis (TB) and are considered a threat for many similar reasons as the other predators.

However, discussion about possums' predation is convoluted since they are vegetarians, and as such they mostly pose a threat due to feeding on native wildlife's source of food (DOC, 2021). The *Practical Guide to Trapping* (the Guide) refers to a video footage from 1993 where possums are seen consuming birds' eggs and chicks, which has changed the public discourse on possums (DOC, 2021). Nonetheless, it is argued that the footage does not provide enough evidence to make such a claim, as the possums in question were captivate and there are no other cases recording such a behavior (Morris, 2019). The Guide furthermore paints possums as "significant predators of NZ land snails" (DOC, 2021; 18), again without much evidence for such claim. Moreover, contents of possums' stomach analysis since the 1950s, indicate that they are indeed herbivores (Morgan, 1981; Sweetapple et al., 2013; Morris, 2019).

Further discussions on possums' eradication include fur harvesting traditionally practiced by some rural Māori communities (Jones et al., 2016). By weaving possum fur into wool, they are creating high-end products that "has grown at about 10% per year over the last 7 years and is currently worth approximately NZ$100 million per year" (Jones et al., 2016; 144). For families practicing this custom, possum eradication implies losing a main income for some as the traps are removed once they stop achieving the economic benefit (Jones et al., 2016). In terms of biodiversity protection, it is estimated that this method of harvesting has a potential to aid in nature conservation, if the fur prices were to increase on a market-level and become a prized commodity (Jones et.at., 2016). Thus, it could be valuable to look into these traditional harvesting practices as a predator eradication method, and it is necessary to take them into account when developing systems of complete eradication.

Predator eradication methods in Aotearoa include predator exclusion fencing, trapping, shooting, hunting, aerial and ground distribution of poison (Peltzer et al., 2019). Each method of predator control changes the landscape in and around it, some as intended lead to protection and preservation of indigenous flora and fauna. However, other changes can be unforeseen, modifying landscapes in ways that can decrease a particular predator, but lead to an increase of another. When targeting only certain pests, as PF2050 does, the margin for such repercussions grows higher. In this chapter, I begin the analysis of predator control techniques; traps used, their clearance regarding animal welfare and allocation areas within Tititea region. Moreover, the interdisciplinary approach to this study relating to natural sciences is demonstrated through the analysis on the poisons dispensation, their chemical composition, toxicological information

and disposal considerations. The technicalities are examined to testify to the need for plural approaches, through consultations with Māori, and advancement of current measures by braiding the Western and Indigenous practices.

4.2.1. Trapping

Trapping in Aotearoa is not restricted to wildlife control professionals but can also be done by volunteers. Trapping is promoted publicly; on highways, DOC and Predator Free websites, visitor centers, various media outlets, through informative booklets, and flyers (as seen traveling through the Otago area). Booklets and flyers can be found on governmental websites, and in visitor centers, such as the *Practical Guide to Trapping* (the Guide), made by DOC in 2021, acquired in the Mt Aspiring NP Visitor Center in Wānaka. That practical guide is used throughout this part of the analysis to a great extent. It demonstrates the government's encouragement and advocacy of trapping activities, and devices, wishing the reader happy trapping in its conclusion (DOC, 2021). As seen within ethical pluralism, public discourses encouraged by the government influence the ideology that people relate to the environment. Thus, the abundance of promotional material, the language used to create it and their content, are an important tool in answering the research question.

The *Animal Welfare Act 1999* serves as Aotearoa's legal regulation body, while the *National Animal Welfare Advisory Committee* (NAWAC) sets the legally non-abiding standards for traps (DOC, 2021l NAWAC, 2019). There are no kill traps in Aotearoa that are legally prohibited for usage, "but some leghold traps have precedent for prohibiting traps with excessive welfare compromise" (Morriss, 2018; 3). To exercise a more humane killing is therefore, ultimately determined by either the individual, agency or manufacturer developing the restraining/killing devices. The establishment of the *Animal Ethics Committee* under the Animal Welfare Act 1999 aids in regulations of traps, insomuch that their approval is necessary to conduct their testing, monitoring, and authorization (NAWAC, 2019). Traps recommended by NAWAC are required to follow the Committee's regulations. Between the year 2000 and 2018, NAWAC tested 89 traps, out of which 37 passed the guidelines and 18 are available for public purchase (NAWAC, 2019). Traps that have passed the NAWAC guidelines, are in usage and available for purchase on various websites. Those are divided into two main categories - restraining and kill traps, each then divided into additional two classes - Class A and Class B

(NAWAC, 2019). Corresponding to classes, restraining traps are regulated according to the suffering caused, including amputation, fractures, skeletal degenerations, and others (NAWAC, 2019). Kill traps record the time to loss of corneal reflex, further dividing them into according to classes (NAWAC, 2019). To determine the trap efficiency, animals are left to suffer for five minutes before euthanization; in the sample of 25 animals, a maximum of four is allowed to exceed the allocated five minutes (NAWAC, 2019). Additionally, new traps are tested in the span of 100 trap nights (as referred in the NAWAC guideline) and compared with the efficiency of the traps currently used for control of that predator.

The Guide to trapping features 17 kinds of different traps; under the title *"Every trap counts"* it gives advice to private individuals on how often to check their traps – ergo it states to check them as often as one likes, weekly or even daily (DOC, 2021). The recommendation should arguably give incentive to check the traps regularly, in order to reduce unnecessary animal welfare. Especially since, according to the Animal Welfare Act 1999, monitoring of the traps is to be done daily, or in cases of electronic recording within the first 24 hours of trapping (Gulliver et al., 2023). Thus, DOC recommendations within the Guide counter the legally binding policy. The Guide further features photographs of trappers – some of whom are children. In terms of trap disposal throughout Mt Aspiring NP, they are distributed along Haast Pass Highway, Young Valley, West Matukituki, Dart Valley and Haast Range (Tokoeka sanctuary) (DOC, 2011; Appendix 7), as a method of mustelid (stoats and ferrets) control found throughout the park. They are additionally used to control possums, also found everywhere in the park, but targeted using kill traps at Ruth Flat, Upper Siberia, Upper Waipara, West Matukituki, Dart, Haast, Okuru, Turnbull, Arawhata, Waipara and Waiatoto Valleys (DOC, 2011; Appendix 7). Thus, there are large areas that require daily monitoring, calibrating, cleaning as so on, all which implies budgeting and enough staff conducting those activities. Considering that DOC is lacking both, advertising trapping to private individuals, and acquiring untrained volunteers (such as kids) can be seen as a method of compensation for those shortcomings.

While traps are relatively low cost – estimated expense is 224 NZ$ per hectare in the span of 50 years, maintenance of those implemented on governmental land should significantly reduce for traps to be effective and sustainable methods of predator control (Norbury et al., 2014). Some suggest further research on self-resetting novel traps, such as Goodnature A24

traps used for stoats and rats to reduce the cost of maintenance. Goodnature traps use a gas canister that needs replacement every 6 months, while the lure requires a substitute once a month (Kelly, 2020). While only A24 traps are currently in use, Goodnature A12 traps have shown effective and humane eradication of possums, where there is moderate to low density (e.g. 1 trap per ha) (DOC, 2015; updated report retrieved in Kelly, 2020). Nevertheless, those are still not used or sold publicly, potentially as NAWAC guidelines do not include traps that use gas (NAWAC, 2019). Finally, although the traps are set according to predators' weight, and their instructions give advice on how to set them and where to avoid targeting native species, unintentional trapping of native species can occur (Russel et al., 2015). There have been cases of accidental trapping of kiwi, and other flightless birds (Gulliver et al., 2023), thus the dilemma about using traps is ongoing – on an ethical level as humane killing/restraining devices, in terms of labor-cost effectiveness, and finally, due to the risk to the wildlife that they are designed to protect.

4.2.2. Toxins used and methods of distribution

Biosecurity control through toxin distribution, especially aerial disposal is the predator eradication measure raising the most controversy in Aotearoa, amongst the public and Māori. There is no univocal opinion about usage of toxins, and although highly contentious, poisons in Aotearoa are easily accessible for purchase and are used by both the government and individuals. This analysis is focused on acute poisons that can lead to poisoning non-target species and affecting the environment in case of prolonged usage (predatorfreenz.org, n.d.). These poisons "may be provided by Councils and Landcare Groups" (predatorfreenz.org, n.d.), and leave a lot of usage responsibility at the hands of nonprofessionals. They are used on private lands, parks, reserves and areas alike, meaning their widespread usage by many different actors involved might be potentially hazardous.

In addition to using them for the ground control of predators, 1080 and brodifacoum are aerially distributed across Aotearoa (Russell et.al, 2015; O'Malley, Stanley & Russell, 2022), and research on aerial distribution of PAPP is ongoing (EPA, 2023). Brodifacoum is more reliable than 1080 in consideration of complete predator eradication, but its environmental persistence (the length of time the toxic stays in the environment) is higher. Therefore, it is mainly used on islands, while 1080 usage is focused on the mainland (Russell et al.,2015).

Aerial distribution of toxins is done due to inaccessibility to some areas considering challenging terrain, as a method of covering larger areas than possible through the ground control, and as cost-effective method as its estimated cost is 20 NZ$ per ha (Russell et.al, 2015). Let us shortly explore that argument.

Inaccessibility implies that carcasses of the poisoned animals are not likely to be removed, which increases the potential of secondary poisoning to non-targeted animals. As for the cost – taking into account all that goes into acquiring 1080 to Aotearoa, transportation cost, insurance, and others, the cost is likely to be much higher. For example, the cost of the Hokonui drop in 2004 was estimated to be 56,40 NZ$ excluding the cost of personnel, preparation of the site, insurance and many other expenses implicated by this predator eradication method (Whiting O'Keefe, 2014). From this, it would seem that the accurate expenditure is much higher than argued by DOC. In terms of animal welfare, a study done on impact of various toxins to possums, showed that 1080 and pindone cause severe suffering (pain, nausea, sickness, and weakness), brodifacoum severe to extreme (breathlessness in addition to former), while cholecalciferol causes extreme suffering (Beausoleil et al., 2010). That suffering can last for hours, in case of 1080 intake, or days to weeks if the animal had been poisoned by brodifacoum or cholecalciferol (Beausoleil et al., 2010). Thus, animal welfare in Aotearoa is ethically convoluted, which led to commissioning a report on continued use of 1080 by the NZ Parliament. The Commissioner at the time, Jan Wright supported the usage of 1080 and discouraged funding for alternatives, as they have not been sufficiently tested (Morris, 2019). Aotearoa's government followed up on Wright's advice.

As seen through ethical pluralism, there are multiple ways of determining right from wrong, however transformation through inclusion is crucial for development of novel methods. Current techniques used for predator control have been developed over half a century ago (Russell et al., 2015). Much as the Mt Aspiring NP Management Plan uses a definition of biodiversity from 1992, to use outdated (or at least unaltered) methods of predator eradication, is to contentiously disregard the changing discourse on nature preservation and animal welfare. Knowledge changes over time, and practices should arguably follow it. In the public arena, support for the toxin distribution continues to decline, as in 2012 only 42% of Aotearoa's population supported this predator eradication method (Russell, 2014). Māori views are further divided when it comes to aerial 1080 disposal, with some Māori organizations strongly

discouraging its usage (Ogilvie et al., 2007). The argument behind this opposition is based on the worldview collision, as those behind the 1080 research are the ones dropping it – a process that largely excludes Māori involvement in the research development (Ogilvie et al., 2007).

Public criticism in general is largely concerned about the toxicity of poison, and care for its environmental persistence, particularly when it comes to drinking water in the areas of 1080 disposal (Weaver, 2006). Additional dilemmas include care for pets' safety, as dogs have often been subjected to secondary poisoning, as well as game animals, from which arises the apprehension regarding aerial 1080 disposal by hunting groups (Weaver, 2006). So far, it is estimated that the toxin distribution reduced the number of possums from 70 million to 30 million in 20 years (Morris, 2019; 103). Subsequently, Morris (2019) argues that the Predator Free movement is unsustainable due to its sole focus on three key predators, that in turn can add to changes in biodiversity, which is elaborated on in the discussion chapter. However, if total eradication would be possible "then the death of at least 130 million predators would save the same numbers of native birds in 5–6 years" (Morris, 2019; 103). Based on those calculations, in the span of 25 years (the approximate remaining length of PF2050) that would equate to 650 million deaths for 650 million lives.

Considering that PF2050 includes a number of actors, private organizations, agencies and so on, consultations with Māori concerning aerial disposal of 1080 have significantly dropped in 2022 to 69% - "the lowest it has been since 2015, in part due to the increased number of private operations" (EPA, 2023; 27). In terms of numbers, out of 55 operations, Māori were consulted on 38 of them, and while this report claims that those included all operations on public land, there were in fact a total of 43 operations on those lands (EPA, 2023). Moreover, distributors of 1080 are not required to consult with Māori on operations performed on private lands (EPA, 2023). Out of 38 consultations with Māori on 1080 distribution, eight operations were altered as a result of those consultations, adapting the geographical span of 1080 distribution and increasing the water testing in areas of 1080 disposal (EPA, 2023). Pollard (2021) argues that oftentimes in cases of consultation, meetings with Māori communities are not sufficiently promoted and/or adjusted to their lifestyle. That leads to low attendance which in turn results in dominance of pest control agencies pushing their agendas in the meetings (Pollard, 2021). She did not manage to acquire the minutes from two meetings, and out of three received, two were in the form of summary, not a written transcript (Pollard, 2021).

Moreover, investigating other cases of consultation, Pollard struggled with finding transcripts majority of times. In the cases she did find them, Pollard (2021) claims that the meetings are conducted through presentation of scientific findings, that she would not characterize as consultations as such. In fact, the communication and means of presenting information to Māori at those meetings, are inconsistent with their way of learning and unrelatable (Pollard, 2021). That has further been recognized by other researchers, such as Shaun Ogilvie, who is alongside other scholars working on conveying the information to Māori in a more appropriate fashion, such as using the food web diagram, and the power point as a medium (Ogilvie et al., 2006; Ogilvie et al., 2007). Creating different visualization outlets provides for a better inclusion and thus, consultation. The biggest apprehension about 1080 usage from Māori is tied to culturally-significant sites – such as around mahinga kai as seen in Ngāi Tahu kaitakitanga and around water. Although 1080's chemical properties allow for a quicker breakdown in nature than brodifacoum, that process can take months in dry conditions, and up to 75 days in poisoned carcasses (Pollard, 2016, Weaver, 2006). Thus, it can be found in invertebrates and fish when used in water catchments, albeit in small concentrations (Pollard, 2016). In 2022, 152 water samples were analyzed and while 1080 was found in four of those tested samples, it was within the acceptable limits (EPA, 2023; 25).

The degradation of 1080 solution in water is dependent on water temperature as it dissolves slower in cold waters (Ogilvie et al., 2007). That is particularly important for the South Island, and its mountainous areas, such as Tititea, as lakes and rivers tend to be cooler than in the warmer climate of the North Island. Disposal of aerial toxins within Mt Aspiring NP is performed to control possums, tahr and goats found either throughout or in specific areas of the park (DOC, 2011). Subsequently, treated areas include Dart, Haast, Okuru, Turnbull, Arawhata, Waipara and Waiatoto Valley (according to trap distribution), Forgotten River, Joe River, Rees Valley, and West Matukituki (DOC, 2011; Appendix 7). In addition to those, the Plan states that the control can be performed through commercial helicopter operations for chamois, red deer, and rats (DOC, 2011; Appendix 7). As seen earlier in the project, most of those areas have a high biodiversity value (habitats to Taonga species) or are declared as Töpuni sites – such as Rees Valley and Dart Slipstream (part of Dart Valley protected under the Water Conservation Act 1997). Therefore, greater inclusion of Māori in research development about toxin disposal, and consultation processes is crucial to protecting biodiversity in ways that take into account both Western and Indigenous streams of knowledge.

In conclusion of this part of the analysis, there is no antidote to 1080 poison, and it is equally toxic to all living beings, excluding plants and some microorganisms (Whiting O'Keefe, 2014). In fact, considering that Aotearoa is the only country in the world using it in such a high dosage, the research on the ramifications of its widespread distribution is not sufficiently developed. In Australia 1080 distribution is severely restricted, while Aotearoa uses roughly 90% of the world's supply of 1080, adding up to 5000 kg per year, in comparison to Australia's 200 kg per year (Whiting O'Keefe, 2014). Additionally, areas are treated with 1080 much more frequently in Aotearoa, than in Australia, with possible effects on insects and landscape changes. Whiting O'Keefe (2014) argues that the amount spread in Aotearoa is sufficient to kill 20 million people, all while advertising NZ as a clean country – an eco-paradise. While DOC claims that 1080 does not have any effect on insects, as they are not likely to encounter baits, there is no adequate research to support such a thesis, as according to its chemical compound, 1080 poison is a potent insecticide (Whiting O'Keefe, 2014). While invertebrates' likelihood of coming across 1080 bait remains low, insects are known to eat carcasses of dead animals. That brings us to the next part of this thesis – the discussion about the potential consequences of pest control on Taonga.

5. Discussion

In this final part of my analysis, I discuss the potential consequences of biosecurity methods on Taonga – through invert events followed by 1080 disposal, and in consideration of incidents that have occurred so far. Those will be examined in connection to the Wai 262 claim in the first part, and the Notice of Cease and Desist by the Maniapoto Tribal Government in the second part. Along with filing the biggest claim of Flora and Fauna (Wai 262), Māori have accused Aotearoa's governmental bodies of crimes – against humanity and the environment due to aerial drops of 1080 onto their land and Taonga. Thus, discussing the potential ramifications of 1080, that led to those attitudes and allegations is eminent, both to understand what preceded it, and what is likely to occur if those methods remain unchanged. The allegations used are chosen to strengthen the voices of marginalized communities and work towards the inclusion of diverse knowledge as per the practice of ethical pluralism.

5.1. Potential consequences of pest control on Taonga

The relevance of potential consequences of pest control on biological diversity requires us to backtrack to the Wai 262, and the reasoning behind the claim. As seen in the historical chapter, Māori filed the case as a result of the Crown's misappropriation of indigenous flora and fauna and denial of their rights dating back to time immemorial (Potter & Rauika Māngai, 2022). Amending the claim over the years, Māori representatives argued that the Crown is in breach of UNDRIP which enforces Indigenous people's right to traditionally owned land (UNDRIP, 2007), as in 2011 following the first report on Wai 262, the authoritative bodies "took the view that nature pre-dates Māori" (Potter & Rauika Māngai, 2022; 20). Proceeding the report (Ko Aotearoa Tēnei/This is Aotearoa), discussion was raised on what falls into the category of Taonga species, as to restrict it to only so-far acknowledged species, is to disregard Māori views on Taonga appearing in physical and meta-physical forms (Potter & Rauika Māngai, 2022). Thus, the concept of Taonga acknowledged Māori understanding of the term in the amended claim, and that is how it is used in this discussion. The potential consequences of biosecurity methods are presented in the continuation of the text, to examine the implications of conservation methods by the Crown, criticized by Māori as inadequate and inversely harmful to Taonga (Wai 262, 1991).

The largest contemporary discussion revolves around the usage of 1080 toxin as a biosecurity measure. Quantities of 1080 disposal have raised many concerns amongst Māori, scientists, scholars, and the general public. While some argue that usage of 1080 as such is not problematic due to its biodegradable properties, to use 5000 kg per year might be. Moreover, the long-term consequences of eradication of a singular pest have yet to be reviewed in detail. There have been occurrences where rat control led to the increase in mice population, or the appearance of them in previously mice-free areas (Caut et al., 2007). Thus, the predator control "could also lead to a competitor release effect" (Caut et al., 2007; 860), called mesopredator release, noted in cases of possums, mice, rats, mustelids, and foxes, sometimes having negative effects on native species (Ruscoe et al., 2011; Murphy et al., 2010; Caut et al., 2007). However, selective poison control is enforced as there is no sufficient budgeting for control of all predator species simultaneously (Caut et al., 2007). Considering data deficiency of the persistent effects on landscapes subjected to poison control, there is a dilemma concerning the Crown's ability to protect Taonga using measures that the research done so far suggests can harm it. Considering the budgeting allocated for the current eradication methods, there are fewer funds available for alternative environmental programs or biodiversity strategies. Predictions state that the Predator Free movement is expected to cost 9.04 billion NZ$ (Russell, 2015), or 0,54% of Aotearoa's annual GDP from now onwards, much higher than the 97 million NZ$ currently allotted (Linklater & Steer, 2018).

Additional potential consequences on Taonga following the toxin disposal, include apprehension about its impact on insects. DOC claims that insects too are gaining from 1080 disposal, as the poison does not build up in insects, thus keeping the forest and its ecosystem safe and improved (doc.govt.nz, n.d.). On their website, it is stated that "when 1080 is used to control introduced predators, the populations of native birds, insects, plants, bats and frogs have a much better chance of survival" (doc.govt.nz, n.d.). However, the study done by Meads (1994) on the effects of non-targeted invertebrates prior to and following 1080 operation in Taranaki in the scope of two years, demonstrated opposing results. The biggest negative impact of 1080 was found to be on beetles, insect larvae (flies, beetles, wasps, and moths), and spiders (Meads, 1994). That occurs as the leaf litter is estimated to carry traces of 1080 dust for three months and is carried by the wind outside of the control area (Meads, 1994). In the more recent study by Lloyd & McQueen (2010; 53), utilizing video surveillance demonstrated that bait

consumption is higher in nocturnal insectivores (such as bats) than in diurnal ones, however as the latter feeds on the former, they are both equally susceptible to death by 1080.

Aotearoa's forests are abundant with insects yet poorly researched, in addition to "significant gaps in our understanding of the Evolution of New Zealand distributions of species and patterns of species richness at local and national scales" (Buckley et al., 2015; 18). Considering such a considerable knowledge gap, the potential long-term consequences on Taonga due to predator control and eradication methods are unknown, hence DOC's arguments and statements being insensible at best. The research conducted so far indisputably raises many dilemmas, seeing the above-mentioned examples. While the cases presented do not originate from the Wai 262 claim, the above-mentioned ones should be discussed as potential data for the Crown's continuous misappropriation of indigenous flora and fauna and restriction of Māori tino rangatiratanga. One of the recurrent statements throughout Ko Aotearoa Tēnei is "What's good for Māori is good for New Zealand" (Potter & Rauika Māngai, 2022; 23), as Māori tend to cherish elements in nature of high intrinsic value. Accordingly, it can be seen that what harms it, overtly harms Māori, thus, to determine the effect that the current biosecurity methods have on Māori and Taonga, requires additional research in various scientific sectors.

5.2. Incidents, casualties, and spillages of the poisons

There is no denial about the high toxicity and hazardous substances of 1080 poison – the signs by DOC point out its danger and are placed all around the visited South Island. Nevertheless, DOC's website states that 1080 has no negative effects on native species (doc.govt.nz, n.d.). Those statements appear inconsistent and are another example of discrepancies found in terms of governmental attitudes. The objective reality would suggest otherwise as argued by Littin et al. (2004; 6) "many of the methods employed cause suffering to the target species and may have unintended negative consequences for non-target species". There is an abundance of examples of accidental by-kills, in fact, the general misconduct of DOC in terms of 1080 disposal is what led to issuing the Notice of Cease and Desist by Te Hapu o te Wakaminenga Wahi o Maniapoto o Nu Tireni (the people of Wakaminenga Wahi o Maniapoto tribe, whereas Nu Tireni presents the territory in the North Island) (Maniapoto Tribal Government, 2018). Examples attached in the Notice are discussed, as well as other instances of spillages or potential malpractice by Aotearoa's governmental bodies.

The Maniapoto Tribal Government filed three notices against DOC, the Ministry of the Environment, and all the agencies supporting and advancing the usage of 1080 poison in 2015, 2016, and 2018 (Maniapoto Tribal Government, 2018). The notices state that using 1080 and toxins alike on their land, is in violation of the Universal Declaration of Human Rights 1948, ICCPR 1966, Supplementary Convention on the Abolition of Slavery, the Slave Trade and Institutions and Practices Similar to Slavery 1956, and Te Tiriti o Waitangi (Maniapoto Tribal Government, 2018). Along with being in breach of the international legislation under the Nuremberg Code, the Maniapoto Tribal Government claims breaches of NZ legislation – such as the Conservation Act 1987, Health (Drinking Water) Amendment Act 2007, Animal Welfare Act 1999, Hazardous Substances and New Organisms Act 1996, Biosecurity Act 1993, and others (Maniapoto Tribal Government, 2018; 3). The "fair and final warning" states the following:

> *"Any further aerial dropping of 1080 poison and interference with Proclaimed Hapu land and members will constitute a Crime Against the Environment and Humanity, Breach of Our Peace, a trespass of jurisdiction, a breach of Te Tiriti o Waitangi 1840 and will create an international incident which will be pursued to the highest International Court where the instigators and perpetrators will be held personally liable for all such criminal charges as may apply and would have to pay Te Hapu o Te Wakaminenga Wahi o Maniapoto £UK1 billion per 1080 poisoning incident (payable in a substance of our choice)"* (Maniapoto Tribal Government, 2018; 3)

Each notice additionally features evidence against the Crown, in the form of incidents that occurred following the 1080 disposal, such as dropping 32000 kg of 1080 near Hamilton over Mt Pirongia (scoop.co.nz, 2014). Corresponding events feed into the discourse of the Crown's mishandling of Taonga in relation to contemporary biosecurity measures.

In continuation, 1080 disposal has been criticized due to the potential by-kill of kea, which Ngāi Tahu views as a Taonga species. A few examples of unintended negative consequences on kea include the 2009 operation, whereas almost half of kea populating Fox Glacier was wiped out following 1080 aerial applications (The Dominion Post, 2009). In a few recent years, six kea monitored by the Kea Conservation trust in Mt Aspiring National Park, died from 1080 poisoning, killing half of its population in the area (DOC media release, 2020).

Additionally, a 7% mortality rate in kea inhabiting the area around Arthur's pass was noted succeeding the 1080 aerial application, as recently as in 2022 (Speedy, 2022). Kea first became a protected species in 1986, with only 1000- 2000 of them left out of the population of 500,000 (Kelly, 2020). Prior to its protection, kea was categorized by farmers as a "sheep-mauling dog", as it would ride on its back, pecking sheep alive (Kelly, 2020; 43). Now discontinued governmental practices aimed at protecting farmers, as well as the illegal killing of kea have led to dropping rates of kea, showing how management of the remaining population by equal inclusion of Māori, as kaitiaki of Taonga, is paramount (Kelly, 2020; Reid, 2019).

Further negligence by DOC has been reported concerning another Ngāi Tahu Taonga species: yellowhead/mohua has suffered decline or extinction in certain areas of the South Island as a result of biosecurity control. Such cases occurred during the control of stoats - the main predators of mohua, but backfired due to the appearance of rats in high numbers that subsequently became supplementary predators (mesopredators) of mohua (Macalister, n.d.). That led to the local extinction of mohua on Mt Stokes in the late 1990s, and early 2000s, and drove them to a serious decline in other areas endangering seven out of nine population groups of mohua left on the South Island (Macalister, n.d.). Kelly (2020) suggests that DOC's release of native birds' neglects occupancy of predators in the area, and thus is performed for media purposes more so than as a conservation method. He calls the need for further research on survival rates of released native birds – which I was not able to obtain.

To further look into potential reasonings behind The Maniapoto Tribal Government's accusations of the crimes by Aotearoa's governmental agencies, it is important to discuss a review by the Environmental Protection Agency (EPA) in relation to complaints and incidents of 1080 operations in 2022. EPA review recorded 24 such events, stating that 7 of those allegedly did not comply with the HSNO Act, out of which they determined four as non-complying (EPA, 2023). However, when reading the report, it is visible how many of those cases were not investigated further – cases of dogs' deaths, bees' deaths, deaths of monitored kea and feral cats, deer deaths, misapplications of the 1080 baits, a person being hit by aerial disposal of 1080 at Routeburn track and others (EPA, 2023). Out of those cases that have not been examined further, I will present the most disconcerting ones. Firstly, in most cases of reported deaths of dogs, or deer, there were no samples taken to determine the cause of their deaths (EPA, 2023). Secondly, spillages of the baits, their misapplication outside the treatment

areas, flying outside the flight corridors, and some instances alike were not investigated further, and have all been identified as in compliance with the HSNO (EPA, 2023). That is due to other organizations, such as DOC, taking over the analysis of incidents reported, on the grounds that spillages did not pose a risk to public health, or other unidentified reasons for the lack of follow-up (EPA, 2023).

In cases where non-compliance with the HSNO Act was identified, EPA issued an advisory letter (EPA, 2023). Those cases occurred as a result of technical difficulties – failures of formatting, troubles with the sun glares, and/or GPS malfunction (EPA, 2023). Considering the potential consequences of misapplication of the poison, one would assume that the ramifications of non-compliance would be greater than the advisory letter. Moreover, as neither DOC nor ZIP were aware of the presence of karoro/black-backed gulls in the treatment area (karoro is Ngāi Tahu Taonga species), 1080 disposal led to a total of 556 deaths of karoro in the South Ōkārito (EPA, 2023). In this case, too, the investigation concluded there was no breach of the HSNO Act, instead "DOC and ZIP have discussed ways to prevent this happening in the future" (EPA, 2023; 32). Furthermore, there is no explanation as to why the samples of dead animals - such as dogs, or deer were not taken. That could potentially play into Quinn's and Kelly's argumentation about the contestation of information by Aotearoa's authoritative bodies.

Another discussion revolves around the GPS accuracy of 1080 disposal. Booth (2018) argues that the pallets can be dropped outside of the treatment area as they tumble down the trees' branches. Kelly follows up on that argument, stating that the pallet dispersion and drift "is affected by the rotor wash and vortices, wind gusts and a swinging bucket on the end of a 20-meter lanyard" (2020; 220) therefore, to drop pallets from a 100-meter height can never be entirely accurate. In fact, farmers around the Waikato conservation area voiced their worry about toxin disposal entering the paddock's boundary causing the deaths of their cows (rnz.co.nz, 2018). As the testing occurred 12 days after the 1080 operation, no traces of it were found in the paddock, hence there was no evidence suggesting it to be the cause of poisoning (rnz.co.nz, 2018).

In the cases of spillages, the clean-up can take days, thus a significant amount of 1080 is still being absorbed by the soil, potentially affecting the flora and fauna. Such a spillage

occurred near Lake Manapouri in 2016, as baits were dropped from the helicopter while it was taking off causing a large number of baits to fall on the ground, which required cleaning for days after the accident (rnz.co.nz, 2016). Considering that the treated areas in Mt Aspiring include Haast Pass (the area of Haast Tokoeka Kiwi Sanctuary), Dart and Rees Valley (protected for their immense biodiversity values), and wetlands with their rich aquatic fauna are found throughout the park, those arguments potentially raise a number of concerns. As argued by Potter and Rauika Māngai (2022; 23), species that Māori give value to are "also seen by others as signifiers of a unique national identity". Thus, to safeguard those through methods that do not invertedly harm them is in the best interest of all of Aotearoa.

5.3. Alternative solutions

Discussion about current predator control methods, particularly through 1080 aerial disposal drops, is ongoing in both public and scientific sectors in Aotearoa. The spiritual significance of Taonga and the connection established through it, is the prime instigator for this biosecurity measure, as indicated in PF2050. In *An open letter from Kaitieki regarding the use of 1080 poison in Aotearoa,* Ngata (2018) states that, while for some iwi, usage of 1080 is not a viable option, for others it is the only option. Thus, to ban it nationally without set-up alternatives would further harm those who currently rely on it (Ngata, 2018). In the letter, Ngata (2018) argues that while the mistrust of 1080 usage remains high, so is the responsibility towards the environment, thus its appropriate use is suggested, which would seem to be a lesser evil in consideration to other currently (un)available options. Furthermore, he calls for greater inclusion of Māori in relation to pest control measures and ends the letter stating the following "we acknowledge that for many of our whānau, this is a provocative issue, filled with mamae and concern for our whenua, waterways, and mokopuna. In that sense, we stand united" (Ngata, 2018). While there is an omnipresent fear and apprehension of 1080, the equal fear relates to the loss of biodiversity. Hence, in the continuation of this discussion, I will present some of the research conducted that taps into the alternative solutions to 1080 usage.

In accordance with the key concerns identified in the ERMA review on 1080 disposal in 2007, the key characteristics of the alternative methods need to be:

> *"(1) be much more selective (e.g. affect only rodents and possums) and ideally be species specific (e.g. kill only species of Rattus) (2) have no greater welfare impacts*

> *than 1080 (3) pose no greater environmental persistence than 1080 (4) pose no greater risk to human health than 1080. (5) be an alternative to toxicants, such as a vaccine or genetically modified organism, but that is socio-politically acceptable"* (Warburton et al., 2021; 82)

While this study is deferring from discussion on genetically modified organisms, due to its complex socio-political implications, other alternative methods are considered as potentially favorable. One of the proposed methods in line with Mātauranga principles was the above-mentioned possum fur harvest. However, according to the current economic value of possum fur, this practice is not a sustainable conservation method. For it to become one, harvesters would need to receive "some payment by the management agencies that, in return, would benefit from possum control, but at lower cost than current standard ground-control methods" (Warburton et al., 2018; 92). Although this is unlikely to occur in the contemporary economic, political, and social climate, the approach would not only enable the continuous practice of harvesting but has the potential to create additional employment opportunities (Warburton et al., 2021).

In line with Mātauranga, there were several native plants identified as toxin alternatives to 1080, out of which tutin emerged as potentially the most successful (Oglivie et al., 2019). That is due to its humanness, as its animal welfare is the lowest out of all the toxins currently available (Oglivie et al., 2019). However, there is no sufficient data in terms of the risk of secondary poisoning or potential bait shyness as the toxin naturally occurs in plants. As there is no antidote to 1080, the potential to develop an antidote to tutin through Māori knowledge about the plant "would be a significant advantage in the development of tutin as a bait, although this would require considerable additional research" (Oglivie et al., 2019; 7). Additional research is necessary for all the alternative and currently used biosecurity methods, and its development with Māori is crucial as according to Peltzer et al. (2019; 425) "Māori do not enter the PFNZ 2050 initiative as equal partners with the Crown". That is imminent to change as Aotearoa's government is obliged to incorporate the Wai 262 ruling in its policies.

Nation-wide sanctuaries have also been proposed as a predator control method of low cost excluding potential ramifications of the current measures (Linklater & Steer, 2018). That would require biosecurity control to be significantly reduced to mostly those areas while

releasing and re-populating native wildlife without the risk of predators. Subsequently, Linklater & Steer (2018; 4) favored this method arguing that “the sanctuary-spillover sites would be selected because they are national biodiversity “hotspots" with the potential to be connected by dispersal or species translocation with other hotspots”. Such a method is more likely to be supported nationally, as it requires adaptation rather than development of novel methods and is focused on protection more so than eradication. The increase in sanctuaries minimizes the harm done to all aspects of predator control – animals, the environment, and the potential harm to humans. It is the approach most closely aligned with what Morris describes (and advocates for) as going back to pre-colonial nature (Morris, 2019; 107), whereas nature is protected for its tangible and intangible characteristics.

None of these methods have yet been researched sufficiently to be implemented as alternatives to current biosecurity methods. Development of novel methods needs to be conducted with Māori as there is concern amongst Māori in consideration of 1080’s potential negative effects on “mauri (life force), kaitiakitanga (guardianship), wairua (spirit), and tikanga (customs) within baited area…wāhi tapu (sacred sites) and mahinga kai (food-gathering) areas” (Warburton et al., 2018; 83). As seen throughout the thesis, all of those concepts are considered as Taonga to Māori, thus for Māori to be informed, included, and consulted is paramount for their right to exercise kaitiakitanga and Tino rangatiratanga as guaranteed in Te Tiriti, an abundance of other official documents and in the most recent Wai 262 ruling. While the intention behind the PF2050 and its initiative to include Māori representatives in its creation is acknowledged, Mātauranga Māori has to be implemented as equal, meaning to the greater regard than it has so far for the program to successfully carry out the Braided Rivers approach.

6. Conclusion

Overall, this study concludes that more research, stronger utilization of official policies, and development of ontology-receptive and inclusive consultation processes are necessary in all fields that braid this socio/political/environmental subject matter. While the conclusion to what is right or wrong remains open, as per the practice of ethical pluralism, there are three aspects of findings that I elaborate on in the final parts of the thesis. Those are: acknowledging the need for novel methods, recognizing that there is a lack of Māori participation and the chance to perform Tino rangatiratanga in relation to biosecurity, and the necessity for additional research in all fields of this study's interest. I have elaborated on each of the findings in detail below, including the suggested further research beyond the study in question.

6.1. Overall findings

Necessity for Novel Methods

As seen throughout the study, there is an abundance of actors involved in the Predator Free movement. While they carry diverse opinions, the research meets in its strive to better the environment and the necessity for weaving various streams of knowledge to advance further research. There is a prevailing recognition of data deficiency in consideration to the workings of our ecosystem, thus there cannot be a complete awareness of any sector of the implications of using drastic methods of predator control, such as 90% of the world's 1080 supply. Considering that "impacts on the environment can affect animals within that environment, and people who use that environment" (Littin, et al., 2004; 4), the effects of pest control that the Predator Free movement is trying to achieve have to be approached with a great amount of care, and inclusion of those who largely formed their realities in interplay with nature. Through using a plural approach to both methods and theory, in connection with Indigenous research methods and philosophical thought, this study has shown that our biodiversity is important to and for everyone, thus we all need to participate in its conservation - equally.

Necessity for Advanced Inclusion

Creating novel tools requires creating a novel environment of applying those streams of knowledge that originate from time immemorial, in Aotearoa accessible through Mātauranga

Māori. Policies and practices on governmental and socio-political levels are required to respect Māori rights to Tino rangatiratanga and traditional land rights through UNDRIP, ICCPR, founding document Te Tiriti, and other regionally focused legislation. While the evidence of practicing integrative pluralism through the inclusion of Mātauranga Māori principles is to some extent, found in official policies, the application of those in practice arguably requires additional strengthening. Seeing that the usage of historical and current biodiversity conservation methods led some Māori to accuse the Crown of crimes against humanity and the environment – in breach of Human Rights, UNDRIP, Te Tiriti, and policies alike, one could argue that the Western dominance continues to prevail in both those sectors and colonial toxins are as hard to eradicate as predators seem to be. Thus, further inclusion of Māori through ontology-receptive consultations, and development of those innovative tools in an advanced socio-political environment are fundamental steps forward towards scientific advancement in this field.

Necessity for Locally Focused Research in the Interdisciplinary Fields

For the reasons above, it is hard to assess the consequences of predator control in the Tititea region. I have not found any academic research, or a case study specifically focused on that area, in relation of the rates of native species, insects, or mesopredator release prior to and succeeding currently applied predator control methods. The answer to what extent these biosecurity measures applied through PF2050 affect Ngāi Tahu Taonga is, therefore, unattainable. However, what this study did demonstrate is that it is unlikely for it to not have any implications at all in this quantity over a prolonged amount of time. Hence, they require a review now, prior to the appearance of unintentional consequences as a direct result of biosecurity methods. Although history repeats itself, the aphorism can be applied to Aotearoa one too many times. By approaching this study through Indigenous and Western methodological and theoretical models, I aspired to illustrate that weaving them can aid in ecosystem preservation. For everyone to be able to enjoy public spaces, especially national parks “for their intrinsic worth and for the benefit, use, and enjoyment of the public” (National Parks Act, 2021; 12), the future and the present need to provide equal space to alternative ontologies, more efficiently than they did in the past. In that way, He Awa Whiria approach – inspired by the rivers of Te Wai Pounamu, can be directly applied in policies and practices to

keep those same waters clean, healthy, and abundant, as well as the whole biological diversity around it.

6.2. Further research

The efforts of Aotearoa's government to implement Wai 262 in its budget and policies are visible, however, there seems to be a discrepancy between the regulations and their follow-up in practice. Although limited, my time spent in Aotearoa enabled me to get a sense of people's attitudes towards DOC and their implicit work, as well as an understanding of public views on toxin usage. While people working for DOC are praised for their altruistic traits, DOC as an organization is not favorable, from the side of local business owners, farmers, and the general public. Oftentimes during unofficial conversations with locals, I would notice a correlation in negative attitudes expressed towards DOC. Those were mostly focused on DOC's lack of communication, prior notice, or consultations when conducting various operations directly impacting those people's livelihoods. Thus, further research is suggested on the application of governmental policies in practice and the means of improving them. As well as on developing stronger consultation processes, taking into consideration Māori ways of learning and expression, through projects such as Shaun Ogilvie's *Overcoming barriers to Maori inclusion in the appropriate use of 1080* and Pollard's *Inadequate consultation of Māori on 1080 poison.*

Furthermore, this study deferred from evaluating methods of predator control that include genetic modification, which is currently prohibited in Aotearoa. I believe that my lack of competency in the natural sciences field, in combination with an incredibly challenging analysis of how those methods influence Māori as a non-Māori person, further investigation on genetic modification would not in any way benefit this research. However, there is a need for advancement of knowledge in that field alone, and in combination with Mātauranga principles. Moreover, further research is suggested in the field of animal welfare, as animal consciousness is poorly studied, and new research indicates that insects might be sentient too (Bush, 2024). Subsequently, insect fauna, fungi, plants, microorganisms, and other aspects of the environment, including all forms of bodies of water and their opulence all require additional examination for these predator eradication measures to be performed safely. With the emergence of the black and green algae – cyanobacteria deadly to dogs and with high health

implications on humans, found on Aotearoa's beaches and lakes (Commer, 2023; Leahy, 2023; odt.co.nz, 2023), further research is a matter of urgency.

Lastly, Predator Free Rakiura is one of the DOC's newest initiatives, "the biggest island predator eradication ever attempted and if successful, a world-first on an inhabited island" (rnz.co.nz, 2022). Rakiura (the Stewart Island) is known as an island of high biodiversity value - with its clean waters, rainforest, and abundance of native species. Casualties and spillages of 1080 have already occurred – in 2018 news reported a second incident of 1080 dumpsite on Rakiura – 75 kg of it, some of which was disposed of in the water (Gower, 2018). That kind of quantity can cause great harm to the island and its inhabitants. Moreover, Rakiura Māori have a special connection with the island, and hold their environmental traditional knowledge to the highest regard (Livera, 2019). Hence, ramification of such an expansive project needs to be investigated in detail, in connection to biodiversity protection, consultation processes, and effects of biosecurity methods on Rakuira Māori's relationship with the island.

Topics on climate change, biodiversity loss and conservation methods in consideration to their influence on Indigenous peoples are an omnipresent discourse in the global environmental, political, and Indigenous arena. This study could have drawn inspiration from other countries facing similar issues, as an additional way to integrate ethical and methodological plurality. Further research is therefore suggested in terms of natural resources management in comparison to the other settler countries and their ways of implementing Indigenous peoples' rights within legislation and practices.

Ko au te whenua, ko te whenua ko au.

I am the land and the land is me.

(Hill, 2021; 37)

Kia whakatōmuri te haere whakamua.

I walk backwards into the future with my eyes fixed on my past.

Māori proverb

7. Bibliography

Literature

Andersen, C., & O'Brien, J. M. (2017). Indigenous studies: An appeal for methodological promiscuity. *Introduction. Andersen and O'Brien, Sources and Methods*, 1-11.

Anderson, A. (1982). Maori settlement in the interior of southern New Zealand from the early 18th to late 19th centuries AD. *The Journal of the Polynesian Society*, *91*(1), 53-80.

Ataria, J. M., Waiwai, J., Doherty, J., & Ogilvie, S. C. (2007). Creating and publicising a web-based database of 1080 and Taonga species information.

Beausoleil, N., Fisher, P., Littin, K., Warburton, B., Mellor, D., Dalefield, R., & Cowan, P. (2016). A systematic approach to evaluating and ranking the relative animal welfare impacts of wildlife control methods: Poisons used for lethal control of brushtail possums (Trichosurus vulpecula) in New Zealand. *Wildlife Research*, *43*(7), 553-565.

Bioethics panel (2019). Predator Free New Zealand: Social, Cultural, and Ethical Challenges. BioHeritage Challenge. 26 pp.

Broughton, D., Te Aitanga-a-Hauiti, T., Porou, N., McBreen, K., Waitaha, K. M., & Tahu, N. (2015). Mātauranga Māori, Tino rangatiratanga and the future of New Zealand science. *Journal of the Royal Society of New Zealand*, *45*(2), 83-88.

Buckley, T. R., Krosch, M., & Leschen, R. A. (2015). Evolution of New Zealand insects: summary and prospectus for future research. *Austral Entomology*, *54*(1), 1-27.

Caniglia, G., Lüderitz, C., von Wirth, T., Fazey, I., Martín-López, B., Hondrila, K., König, A., von Wehrden, H., Schäpke, N. A., & Laubichler, M. D. (2021). A pluralistic and integrated approach to action-oriented knowledge for sustainability. *Nature Sustainability*, *4*(2), 93-100.

Caut, S., Casanovas, J. G., Virgos, E., Lozano, J., Witmer, G. W., & Courchamp, F. (2007). Rats dying for mice: modelling the competitor release effect. *Austral Ecology*, *32*(8), 858-868.

Chilisa, B. (2020). *Indigenous research methodologies*. Sage publications.

Chilisa, B., & Tsheko, G. N. (2014). Mixed methods in indigenous research: Building relationships for sustainable intervention outcomes. *Journal of Mixed Methods Research*, *8*(3), 222-233.

Clarke, N. J., Caddick, N., & Frost, N. (2016). Pluralistic data analysis: Theory and practice. In *Routledge handbook of qualitative research in sport and exercise* (pp. 390-403). Routledge.

Cortes-Capano, G., Hausmann, A., Di Minin, E., & Kortetmäki, T. (2022). Ethics in biodiversity conservation: the meaning and importance of pluralism. *Biological Conservation*, *275*, 109759.

Craig, J., Anderson, S., Clout, M., Creese, B., Mitchell, N., Ogden, J., Roberts, M., & Ussher, G. (2000). Conservation issues in New Zealand. *Annual Review of ecology and Systematics*, *31*(1), 61-78.

Crow, S. K., Tipa, G. T., Nelson, K. D., & Whitehead, A. L. (2020). Incorporating Māori values into land management decision tools. *New Zealand journal of marine and freshwater research*, *54*(3), 431-448.

Gulliver, E., Hunter, S., Vallee, E., & Castillo-Alcala, F. (2023). Causes of mortality of kiwi (Apteryx spp.) in New Zealand: a retrospective analysis of post-mortem records, 2010–2020. *New Zealand Veterinary Journal*, *71*(2), 75-85.

Harper, M., White, R., Gissibl, B., Höhler, S., & Kupper, P. (2012). How national were the first national parks? *Civilizing nature: national parks in global historical perspective*, 50-67.

Hepburn, A., & Potter, J. (2004). Discourse analytic practice. *Qualitative research practice*, 180-196.

Hikuroa, D. (2017). Mātauranga Māori—the ūkaipō of knowledge in New Zealand. *Journal of the Royal Society of New Zealand*, *47*(1), 5-10.

Hill, C. (2021). *Kia Whakanuia Te Whenua: People, Place, Landscape*. Mary Egan Publishing.

Himes, A., & Muraca, B. (2018). Relational values: the key to pluralistic valuation of ecosystem services. *Current opinion in environmental sustainability*, *35*, 1-7.

Irwin, K. (2022). What does retirement look like for Māori? Decolonising Public Policy: The Galaxy, the Gavel and the Gun. *Te Ara Ahunga Ora Retirement Commission*

Jones, C., Barron, M., Warburton, B., Coleman, M., Lyver, P. O. B., & Nugent, G. (2012). Serving two masters: reconciling economic and biodiversity outcomes of brushtail possum (Trichosurus vulpecula) fur harvest in an indigenous New Zealand forest. *Biological Conservation*, *153*, 143-152.

Kelly, L. (2020). *DUPED! The True Story Behind Predator Free New Zealand*. Les Kelly.

Linklater, W., & Steer, J. (2018). Predator Free 2050: A flawed conservation policy displaces higher priorities and better, evidence-based alternatives. *Conservation Letters*, *11*(6), e12593.

Littin, K., Mellor, D., Warburton, B., & Eason, C. (2004). Animal welfare and ethical issues relevant to the humane control of vertebrate pests. *New Zealand Veterinary Journal*, *52*(1), 1-10.

Lloyd, B., & McQueen, S. (2000). An assessment of the probability of secondary poisoning of forest insectivores following an aerial 1080 possum control operation. *New Zealand Journal of Ecology*, 47-56.

Macfarlane, A., & Macfarlane, S. (2019). Listen to culture: Māori scholars' plea to researchers. *Journal of the Royal Society of New Zealand*, *49*(sup1), 48-57.

Macfarlane, A. H., Macfarlane, S., & Webber, M. (2015). *Sociocultural realities: Exploring new horizons*. Canterbury University Press.

Midgley, G. (1991). The legitimation of systems science. *Systems Science in the 21st Century: Integrating the New Sciences of Complexity in Service of Humans and Their Environment*, 13-21.

Midgley, G., & Lindhult, E. (2021). A systems perspective on systemic innovation. *Systems research and behavioral science*, *38*(5), 635-670.

Midgley, G., Nicholson, J. D., & Brennan, R. (2017). Dealing with challenges to methodological pluralism: The paradigm problem, psychological resistance and cultural barriers. *Industrial Marketing Management*, *62*, 150-159.

Midgley, G., & Ochoa-Arias, A. E. (2001). Unfolding a theory of systemic intervention. *Systemic practice and action research*, *14*, 615-649.

Moon, K., & Pérez-Hämmerle, K. V. (2022). Inclusivity via ontological accountability. *Conservation Letters*, *15*(5), e12888.

Morgan, D. (1981). Predation on a sparrow by a possum. *Notornis*, *28*, 167-168.

Morgan, D. R. (1994). Improving aerial control of possums by precision bait delivery. *Proceedings of the Sixteenth Vertebrate Pest Conference (1994)*, 38.

Morris, M. C. (2019). Predator free New Zealand and the 'War'on pests: Is it a just war? *Journal of Agricultural and Environmental Ethics*, *33*(1), 93-110.

Morriss, G. (2018) Traps for Predator Free NZ: Clarifying which traps have passed the NAWAC guideline

Murphy, E. C., Clapperton, B. K., Bradfield, P. M., & Speed, H. J. (1998). Effects of rat-poisoning operations on abundance and diet of mustelids in New Zealand podocarp forests. *New Zealand Journal of Zoology*, *25*(4), 315-328.

Norbury, G., Hutcheon, A., Reardon, J., & Daigneault, A. (2014). Pest fencing or pest trapping: A bio-economic analysis of cost-effectiveness. *Austral Ecology*, *39*(7), 795-807.

O'Malley, T. D., Stanley, M. C., & Russell, J. C. (2022). Assessing two different aerial toxin treatments for the management of invasive rats. *Animals*, *12*(3), 309.

Ogilvie, S., Ataria, J. M., Waiwai, J., & Doherty, J. (2006). Overcoming barriers to Maori inclusion in the appropriate use of 1080.

Ogilvie, S. C., Sam, S., Barun, A., Van Schravendijk-Goodman, C., Doherty, J., Waiwai, J., Pauling, C. A., Selwood, A. I., Ross, J. G., & Bothwell, J. C. (2019). Investigation of tutin, a naturally-occurring plant toxin, as a novel, culturally-acceptable rodenticide in New Zealand. *New Zealand Journal of Ecology*, *43*(3), 1-8.

Olsen, T. A., & Sollid, H. (2022). Introducing Indigenising education and citizenship. In *Indigenising Education and Citizenship: Perspectives on Policies and Practices from Sápmi and Beyond* (pp. 13-32).

Pascual, U., Adams, W. M., Díaz, S., Lele, S., Mace, G. M., & Turnhout, E. (2021). Biodiversity and the challenge of pluralism. *Nature Sustainability*, *4*(7), 567-572.

Peltzer, D. A., Bellingham, P. J., Dickie, I. A., Houliston, G., Hulme, P. E., Lyver, P. O. B., McGlone, M., Richardson, S. J., & Wood, J. (2019). Scale and complexity implications of making New Zealand predator-free by 2050. *Journal of the Royal Society of New Zealand*, *49*(3), 412-439.

Pollard, J. (2016). Aerial 1080 poisoning in New Zealand: Reasons for concern.

Powlesland, R., Knegtmans, J., & Styche, A. (2000). Mortality of North Island tomtits (Petroica macrocephala toitoi) caused by aerial 1080 possum control operations, 1997-98, Pureora Forest Park. *New Zealand Journal of Ecology*, 161-168.

Pretty, J., Adams, B., Berkes, F., De Athayde, S. F., Dudley, N., Hunn, E., Maffi, L., Milton, K., Rapport, D., & Robbins, P. (2009). The intersections of biological diversity and cultural diversity: towards integration. *Conservation and Society*, *7*(2), 100-112.

Pybus, T. A. (1954). *Maori and missionary: early christian missions in the south island of new zealand*. AH & AW Reed.

Quinn, M. F. (2003). *Indigenous people and natural protected areas: tangata whenua and Mount Aspiring National Park* Lincoln University].

Rauika Māngai & Potter, H. M. (2022). *A Wai 262 best practice guide for science partnerships with kaitiaki for research involving Taonga: Lessons from Māori voices in the New Zealand science sector* (0473634147).

Rawluk, A., Ford, R. M., & Williams, K. J. (2018). Value-based scenario planning: Exploring multifaceted values in natural disaster planning and management. *Ecology & Society*, *23*(4).

Reid, C. E. (2019). *Understanding attacks by kea (Nestor notabilis), an endemic parrot, on sheep (Ovis aries) in the South Island high country: a thesis presented in partial fulfilment of the requirements for the degree of Doctor of Philosophy in Animal Science at Massey University/Te Kunenga ki Pūrehuroa, Manawatū, Aotearoa New Zealand* Massey University].

Robinson, J. G. (2010). Ethical pluralism, pragmatism, and sustainability in conservation practice. *Biological Conservation*, *144*(3), 958-965.

Ruru, J. (2004). Indigenous peoples' ownership and management of mountains: The Aotearoa/New Zealand experience. *Indigenous LJ*, *3*, 111.

Ruru, J. (2008). A Maori right to own and manage national parks?

Ruru, J., & Kohu-Morris, J. (2020). 'Maranga Ake Ai'The Heroics of Constitutionalising Te Tiriti O Waitangi/The Treaty of Waitangi in Aotearoa New Zealand. *Federal law review*, *48*(4), 556-569.

Ruscoe, W. A., Ramsey, D. S., Pech, R. P., Sweetapple, P. J., Yockney, I., Barron, M. C., Perry, M., Nugent, G., Carran, R., & Warne, R. (2011). Unexpected consequences of control: competitive vs. predator release in a four-species assemblage of invasive mammals. *Ecology Letters*, *14*(10), 1035-1042.

Ruscoe, W. A., Sweetapple, P. J., Perry, M., & Duncan, R. P. (2013). Effects of spatially extensive control of invasive rats on abundance of native invertebrates in mainland New Zealand forests. *Conservation Biology*, *27*(1), 74-82.

Russell, J. C. (2014). A comparison of attitudes towards introduced wildlife in New Zealand in 1994 and 2012. *Journal of the Royal Society of New Zealand*, *44*(4), 136-151.

Russell, J. C., Innes, J. G., Brown, P. H., & Byrom, A. E. (2015). Predator-free New Zealand: conservation country. *BioScience*, *65*(5), 520-525.

Scobie, M., Lee, B., & Smyth, S. (2021). Braiding together student and supervisor aspirations in a struggle to decolonize. *Organization*, *28*(5), 857-875.

Smith, P. M. (2006). The application of critical discourse analysis in environmental dispute resolution. Ethics, Place and Environment, 9(1), 79-100.

Stewart, G. (2020). *Maori philosophy: Indigenous thinking from Aotearoa*. Bloomsbury Publishing.

Stewart-Harawira, M. W. (2020). Troubled waters: Maori values and ethics for freshwater management and New Zealand's fresh water crisis. *Wiley Interdisciplinary Reviews: Water*, *7*(5), e1464.

Stewart, G. (2020). *Maori philosophy: Indigenous thinking from Aotearoa*. Bloomsbury Publishing.

Stokes, E. (1999). Te Kooti Tango Whenua: The Native Land Court 1864–1909.

Sweetapple, P. J., Ruscoe, W. A., & Nugent, G. (2014). Dietary changes in response to population reduction in the possum Trichosurus vulpecula in New Zealand. *Wildlife Research*, *40*(7), 561-569.

Towns, D. R., Daugherty, C. H., Broome, K., Timmins, S., & Clout, M. (2019). The thirty-year conservation revolution in New Zealand: an introduction. *Journal of the Royal Society of New Zealand*, *49*(3), 243-258.

Trisos, C. H., Auerbach, J., & Katti, M. (2021). Decoloniality and anti-oppressive practices for a more ethical ecology. *Nature Ecology & Evolution*, *5*(9), 1205-1212.

Tuhiwai, L. (2022). *Decolonizing methodologies: Research and indigenous peoples*. Bloomsbury Academic.

Virtanen, P. K., Olsen, T., & Keskitalo, P. (2021). Contemporary Indigenous research within Sámi and global Indigenous studies contexts. In *Indigenous research methodologies in Sámi and global contexts* (pp. 7-32). Brill.

Warburton, B., Eason, C., Fisher, P., Hancox, N., Hopkins, B., Nugent, G., Ogilvie, S., Prowse, T. A., Ross, J., & Cowan, P. E. (2022). Alternatives for mammal pest control in New Zealand in the context of concerns about 1080 toxicant (sodium fluoroacetate). *New Zealand Journal of Zoology*, *49*(2), 79-121.

Weaver, S. A. (2006). Chronic toxicity of 1080 and its implications for conservation management: a New Zealand case study. *Journal of Agricultural and Environmental Ethics*, *19*, 367-389.

Williams, J. (2012). Ngāi Tahu kaitiakitanga. *MAI journal*, *1*(2), 89-102.

Media release

Department of Conservation. (2020). Kea cause of death confirmed. *Www.Doc.Govt.Nz*. Retrieved 2024, from https://www.doc.govt.nz/news/media-releases/2020-media-releases/kea-cause-of-death-confirmed/.

Te Pānui Pāpāho (2022) Investment in Treaty relationship recognises Wai 262 rangatira and their legacy, In *Wai 262 Kia Whakapumau*. Retrieved May 9, 2024, from https://www.wai262.nz/investment-in-treaty-relationship.

Primary Sources

Claim Wai 262 (1991). Waitangi Tribunal Division

Department of Conservation (2011). Mount Aspiring National Park Management Plan. Dunedin, New Zealand; DOC.

Department of Conservation (2016). Battle for our Birds. Wellington, New Zealand; DOC.

Department of Conservation (2022). Conservation Act 1987. New Zealand; DOC.

Department of Conservation (2023). Otago Conservation Management Strategy. Otago, New Zealand; DOC.

Department of Conservation (2021). Practical Guide to Trapping. *Predator Free 2050*, New Zealand; DOC.

Department of Conservation (2020). Te Mana o te Taiao - Aotearoa New Zealand Biodiversity Strategy 2020 (ANZBS). Wellington, New Zealand; DOC.

Department of Conservation (2020). Towards a Predator Free New Zealand: Predator Free 2050 Strategy (PFNZ). Wellington, New Zealand; DOC.

Department of Conservation (2021). National Parks Act 1980. New Zealand; DOC.

Environmental Protection Authority (2023). Aerial 1080 use in Aotearoa New Zealand in 2022 An annual report on the aerial operations, research, and incidents relating to aerial 1080 use. Wellington. New Zealand

Maniapoto Tribal Government (2018). Notice of Cease and Desist. Nu Tireni, New Zealand; Maniapoto Tribal Government.

Ministry for Primary Industries (2019). NAWAC GUIDELINE 09: Assessing the welfare performance of restraining and kill traps. Wellington. New Zealand

Ministry of Research, S., & Technology. (2007). *Vision Mātauranga: unlocking the innovation potential of Māori knowledge, resources and people*.

Office for Māori Crown Relations (2022). Ngāi Tahu Claims Settlement Act 1998. Wellington, New Zealand; Published under the authority of the New Zealand Government.

United Nations (General Assembly). (2007). *Declaration on the Rights of Indigenous People.*

Websites

1080 spilled from Doc Helicopter as it took off. RNZ. (2016). https://www.rnz.co.nz/news/national/317868/1080-spilled-from-doc-helicopter-as-it-took-off

3. human rights protection against interference in Cultural Practices – International Law. NIM. (n.d.). https://www.nhri.no/en/report/human-rights-protection-against-interference-in-traditional-sami-areas/3-human-rights-protection-against-interference-in-cultural-practices-international-law/

Algae in full bloom in area of concern. Otago Daily Times Online News. (2023). https://www.odt.co.nz/regions/south-otago/algae-full-bloom-area-concern?fbclid=IwAR22V2I-5ZaYdnOm58uigKYcHViUkph8ZYPfelvFuXcqxJqIz_vFtPF6b4c

Booth, G. (2018). *A discussion on New Zealand Conservation & issues around 1080 by Geoff Booth*. LinkedIn. https://www.linkedin.com/pulse/discussion-new-zealand-conservation-issues-around-1080-geoff-booth

Brockie, B. (2008). Introduced animal pests - Possums, in *Te Ara - the Encyclopedia of New Zealand*, http://www.TeAra.govt.nz/en/introduced-animal-pests/page-2 (accessed 5 May 2024)

Bush, E. (2024). *Scientists push new paradigm of animal consciousness, saying even insects may be sentient*. NBCNews.com. https://www.nbcnews.com/science/science-news/animal-consciousness-scientists-push-new-paradigm-rcna148213

Comer, R. (2023). *Health warnings now in place at six South Canterbury waterways*. Stuff. https://www.stuff.co.nz/timaru-herald/133456218/health-warnings-now-in-place-at-six-south-canterbury-waterways?fbclid=IwAR3ENBmcN1hb_NCwJnEG9xLbRJ32YjrX_ZtMskDPoR-Nd3DLT7SJF5-Ttuw

Dan Hikuroa. Te Pūnaha Matatini. (n.d.). https://www.tepunahamatatini.ac.nz/dan-hikuroa/

Department of Conservation. (n.d.). https://www.doc.govt.nz/

DOC reviews 1080 use after endangered kea die. Stuff. (2009). https://www.stuff.co.nz/environment/555051/DOC-reviews-1080-use-after-endangered-kea-die

Explorer Home. Sign In. (n.d.). https://explorers.nationalgeographic.org/directory/james-c-russell

Farmers feel let down after cattle deaths following 1080 drop. (2018). https://www.rnz.co.nz/news/country/366766/farmers-feel-let-down-after-cattle-deaths-following-1080-drop

Gerald Midgley. University of Birmingham. (n.d.). https://www.birmingham.ac.uk/staff/profiles/bli/midgley-gerald

Gower, P. (2019). *1080 dumpsite uncovered in Stewart Island National Park*. Newshub. https://www.newshub.co.nz/home/new-zealand/2018/07/exclusive-1080-dumpsite-uncovered-in-stewart-island-national-park.html

Griffin, P. (2009). *1080 use - is it justified? scientists respond.* Science Media Centre. https://www.sciencemediacentre.co.nz/2009/11/13/1080-use-is-it-justified-scientists-respond/

Grzelewski, D. (n.d.). *Routeburn*. New Zealand Geographic. https://www.nzgeo.com/stories/routeburn/

Karunanidhi, M. (2023). *What would pulling out of the undrip mean for New Zealand?*. The Spinoff. https://thespinoff.co.nz/politics/14-12-2023/what-would-pulling-out-of-the-undrip-mean-for-new-zealand

Kōmako. komako.org.nz. (n.d.). https://www.komako.org.nz/person/1430

Largest Island-based predator eradication attempt to take place on Rakiura Stewart Island. RNZ. (2022). https://www.rnz.co.nz/news/national/470480/largest-island-based-predator-eradication-attempt-to-take-place-on-rakiura-stewart-island

Leahy, B. (2023). *Black algae triggers health warning on Waiheke Island*. NZ Herald. https://www.nzherald.co.nz/nz/black-algae-okeania-spp-triggers-health-warning-on-waiheke-island/MMEIRFOT55GMVFBJJ6YG2WWETY/?fbclid=IwAR0hw_vUVcFrkSjOWtWrvwCHhP-xgS3CBO_gp-e719Mhxml7rMep-j-5Bnw

Livera, L. (2019). *Contribution of traditional ecological knowledge in restoration ecology and sustainable resource use: Based on a case study of Titi Bird Harvesting*. 3Rs of Ecology.

https://biol420eres525.wordpress.com/2019/06/05/contribution-of-traditional-ecological-knowledge-in-restoration-ecology-and-sustainable-resource-use-based-on-a-case-study-of-titi-bird-harvesting/

Haami, B. (2008). Kiore – Pacific rats, in *Te Ara - the Encyclopedia of New Zealand*, http://www.TeAra.govt.nz/en/kiore-pacific-rats/print (accessed 9 May 2024)

Henare, M. (2008). External links and sources, in *Te Ara - the Encyclopedia of New Zealand*, http://www.TeAra.govt.nz/en/te-mahi-kai-food-production economics/sources (accessed 5 May 2024)

History of Hāwea Flat & Lake hāwea. HCA. (n.d.). https://www.haweacommunity.nz/history-of-hawea

Jacinta Ruru: Council: Te Wānanga o aotearoa: Twoa. Te Wānanga o Aotearoa. (n.d.). https://www.twoa.ac.nz/te-whare/te-mana-whakahaere-council/jacinta-ruru

Makere Stewart-Harawira (n.d.). https://apps.ualberta.ca/directory/person/makere

Manaaki Whenua. (n.d.). https://www.landcareresearch.co.nz/

Māori philosophy. Maori Philosophy. (n.d.). https://www.maoriphilosophy.com/

Macalister, A. (n.d.). *Mohua in trouble*. New Zealand Geographic. https://www.nzgeo.com/stories/mohua-in-trouble/

Meads, M. (1994). Effect of sodium fluoroacetate (1080) on non-target invertebrates of Whitecliffs Conservation Area, Taranaki. https://1080science.co.nz/wp-content/uploads/2014/05/3-Submitter-9143-Meads-Report.pdf

Mt Pirongia Poison Drop Breaches 1080 Warning label. Scoop. (2014). https://www.scoop.co.nz/stories/SC1409/S00058/mt-pirongia-poison-drop-breaches-1080-warning-label.htm

Ngāio Beausoleil. NAWAC. (2021). https://www.nawac.org.nz/animal-sentience/workshop/Ngāio-beausoleil/

Ngata (2018). https://ngaherejustice.wix.com/letter/english

Pollard, J. C. (2023). *Dr. Jo Pollard, BSC (hons), Phd in zoology: A passionate advocate for science and Wildlife*. 1080 Science. https://1080science.co.nz/author/jo-pollard/

Pollard, J. C. (2021). *Inadequate consultation of Māori on 1080 poison*. 1080 Science. https://1080science.co.nz/inadequate-consultation-of-maori-on-1080-poison/

Predator Free NZ Trust. (n.d.). https://predatorfreenz.org/about-us/predator-free-2050/predator-free-2050-vision/

Professor Jacinta Ruru (2023). Our People, Faculty of Law | University of Otago. https://www.otago.ac.nz/law/staff/jacinta_ruru

Professor Shaun Ogilvie. Science Learning Hub. (n.d.). https://www.sciencelearn.org.nz/resources/375-professor-shaun-ogilvie

Whiting-Okeefe, Q. (2014). https://1080science.co.nz/wp-content/uploads/2014/05/testimony.pdf

Safety Data Sheet 1080 solution. (2001). MSDS, https://pestoff.co.nz/wp content/uploads/2021/03/20-1080-Solution.pdf

Shaun Ogilvie. Cawthron Institute. (2022). https://www.cawthron.org.nz/our-people/shaun-ogilvie/

Speedy, J. (2022). *"It's awful": Doc says it needs to do better after 1080 drop kills endangered kea*. Newshub. https://www.newshub.co.nz/home/new-zealand/2022/10/department-of-conservation-says-it-needs-to-do-better-after-1080-drop-kills-kea.html

Srinivasa, Y. (2023). *"Spy wallabies" released in two districts to target pest population*. Stuff. https://www.stuff.co.nz/otago/133480142/spy-wallabies-released-in-two-districts-to-target-pest-population?fbclid=IwAR1_5K3wDeug5fvL2iS44xZzxcavQQHnMGmLoNoWcZ0HxpHXSDMVpJ7VZD8

Steer, J., Munro, D., & Linklater, W. (2023). *SPCA should be praised not scorned*. Newsroom. https://newsroom.co.nz/2019/01/15/spca-should-be-praised-not-scorned/

Te aka māori dictionary. Te Aka Māori Dictionary. (n.d.). https://maoridictionary.co.nz/

Walrond, C. (2008). Hunting - Imported game animals, in *Te Ara - the Encyclopedia of New Zealand*, http://www.TeAra.govt.nz/en/hunting/page-1 (accessed 5 May 2024)

Wai 262 Secretariat. (2024). *Wai 262 booklet - preserving Taonga Māori*. Kāinga - Wai 262, Protecting and Nurturing Taonga Māori. https://www.wai262.nz/wai-262-booklet4e147400

Waitangi Tribunal Te Rōpū Whakamana i Te Tiriti o waitangi. Waitangi Tribunal | Waitangi Tribunal. (n.d.). https://www.waitangitribunal.govt.nz/

Appendices

List of Taonga species per the Ngāi Tahu Settlement Act 1998

Schedule 97
Taonga species

s 287

Birds

Name in Māori	Name in English	Scientific name
Hoiho	Yellow-eyed penguin	*Megadyptes antipodes*
Kāhu	Australasian harrier	*Circus approximans*
Kākā	South Island kākā	*Nestor meridionalis meridionalis*
Kākāpō	Kākāpō	*Strigops habroptilus*
Kākāriki	New Zealand parakeet	*Cyanoramphus* spp
Kakaruai	South Island robin	*Petroica australis australis*
Kakī	Black stilt	*Himantopus novaezelandiae*
Kāmana	Crested grebe	*Podiceps cristatus*
Kārearea	New Zealand falcon	*Falco novaeseelandiae*
Karoro	Black-backed gull	*Larus dominicanus*
Kea	Kea	*Nestor notabilis*
Kōau	Black shag	*Phalacrocorax carbo*
	Pied shag	*Phalacrocorax varius varius*
	Little shag	*Phalacrocorax melanoleucos brevirostris*
Koekoeā	Long-tailed cuckoo	*Eudynamys taitensis*
Kōparapara *or* Korimako	Bellbird	*Anthornis melanura melanura*
Kororā	Blue penguin	*Eudyptula minor*
Kōtare	Kingfisher	*Halcyon sancta*
Kōtuku	White heron	*Egretta alba*
Kōwhiowhio	Blue duck	*Hymenolaimus malacorhynchos*
Kūaka	Bar-tailed godwit	*Limosa lapponica*
Kūkupa/Kererū	New Zealand wood pigeon	*Hemiphaga novaeseelandiae*
Kuruwhengu/Kuruwhengi	New Zealand shoveller	*Anas rhynchotis*
Mātā	Fernbird	*Bowdleria punctata punctata* and *Bowdleria punctata stewartiana* and *Bowdleria*

Name in Māori	Name in English	Scientific name
		punctata wilsoni and *Bowdleria punctata candata*
Matuku moana	Reef heron	*Egretta sacra*
Miromiro	South Island tomtit	*Petroica macrocephala macrocephala*
Miromiro	Snares Island tomtit	*Petroica macrocephala dannefaerdi*
Mohua	Yellowhead	*Mohoua ochrocephala*
Pākura/Pūkeko	Swamp hen/Pūkeko	*Porphyrio porphyrio*
Pārera	Grey duck	*Anas superciliosa*
Pateke	Brown teal	*Anas aucklandica*
Pīhoihoi	New Zealand pipit	*Anthus novaeseelandiae*
Pīpīwharauroa	Shining cuckoo	*Chrysococcyx lucidus*
Pīwakawaka	South Island fantail	*Rhipidura fuliginosa fuliginosa*
Poaka	Pied stilt	*Himantopus himantopus*
Pokotiwha	Snares crested penguin	*Eudyptes robustus*
Pūtakitaki	Paradise shelduck	*Tadorna variegata*
Riroriro	Grey warbler	*Gerygone igata*
Roroa	Great spotted kiwi	*Apteryx haastii*
Rowi	Ōkārito brown kiwi	*Apteryx mantelli*
Ruru koukou	Morepork	*Ninox novaeseelandiae*
Takahē	Takahē	*Porphyrio mantelli*
Tara	Terns	*Sterna* spp
Tawaki	Fiordland crested penguin	*Eudyptes pachyrhynchus*
Tete	Grey teal	*Anas gracilis*
Tīeke	South Island saddleback	*Philesturnus carunculatus carunculatus*
Tītī	Sooty shearwater/Muttonbird/ Hutton's shearwater Common diving petrel South Georgian diving petrel Westland petrel Fairy prion Broad-billed prion White-faced storm petrel Cook's petrel	*Puffinus griseus* and *Puffinus huttoni* and *Pelecanoides urinatrix* and *Pelecanoides georgicus* and *Procellaria westlandica* and *Pachyptila turtur* and *Pachyptila vittata* and *Pelagodroma marina* and *Pterodroma cookii* and *Pterodroma inexpectata*

Name in Māori	Name in English	Scientific name
	Mottled petrel	
Tītitipounamu	South Island rifleman	*Acanthisitta chloris chloris*
Tokoeka	South Island brown kiwi	*Apteryx australis*
Toroa	Albatrosses and Mollymawks	*Diomedea* spp
Toutouwai	Stewart Island robin	*Petroica australis rakiura*
Tūī	Tūī	*Prosthemadera novaeseelandiae*
Tutukiwi	Snares Island snipe	*Coenocorypha aucklandica huegeli*
Weka	Western weka	*Gallirallus australis australis*
Weka	Stewart Island weka	*Gallirallus australis scotti*
Weka	Buff weka	*Gallirallus australis hectori*

Plants

Name in Māori	Name in English	Scientific name
Akatorotoro	White rata	*Metrosideros perforata*
Aruhe	Fernroot (bracken)	*Pteridium aquilinum* var *esculentum*
Harakeke	Flax	*Phormium tenax*
Horoeka	Lancewood	*Pseudopanax crassifolius*
Houhi	Mountain ribbonwood	*Hoheria lyalli* and *H. glabata*
Kahikatea	Kahikatea/White pine	*Dacrycarpus dacrydioides*
Kāmahi	Kāmahi	*Weinmannia racemosa*
Kānuka	Kānuka	*Kunzia ericoides*
Kāpuka	Broadleaf	*Griselinia littoralis*
Karaeopirita	Supplejack	*Ripogonum scandens*
Karaka	New Zealand laurel/Karaka	*Corynocarpus laevigata*
Karamū	Coprosma	*Coprosma robusta, coprosma lucida, coprosma foetidissima*
Kātote	Tree fern	*Cyathea smithii*
Kiekie	Kiekie	*Freycinetia baueriana* subsp *banksii*
Kōhia	NZ Passionfruit	*Passiflora tetranda*
Korokio	Korokio Wire-netting bush	*Corokia cotoneaster*

Name in Māori	Name in English	Scientific name
Toetoe	Toetoe	*Cortaderia richardii*
Tōtara	Tōtara	*Podocarpus totara*
Tutu	Tutu	*Coriaria* spp
Whararikī	Mountain flax	*Phormium cookianum*
Whīnau	Hīnau	*Elaeocarpus dentatus*
Wī	Silver tussock	*Poa cita*
Wīwī	Rushes	*Juncus* all indigenous *Juncus* spp and *J. maritimus*

Marine mammals

Name in Māori	Name in English	Scientific name
Ihupuku	Southern elephant seal	*Mirounga leonina*
Kekeno	New Zealand fur seals	*Arctocephalus forsteri*
Paikea	Humpback whales	*Megaptera novaeangliae*
Parāoa	Sperm whale	*Physeter macrocephalus*
Rāpoka/Whakahao	New Zealand sea lion/ Hooker's sea lion	*Phocarctos hookeri*
Tohorā	Southern right whale	*Balaena australis*

Schedule 98
Customary fisheries

s 297

Part A
Taonga fish species

Name in Māori	Name in English	Scientific name
Kāeo	Sea tulip	*Pyura pachydermatum*
Koeke	Common shrimp	*Palaemon affinis*
Kōkopu/Hawai	Giant bully	*Gobiomorphus gobioides*
Kōwaro	Canterbury mudfish	*Neochanna burrowsius*
Paraki/Ngaiore	Common smelt	*Retropinna retropinna*
Piripiripōhatu	Torrentfish	*Cheimarrichthys fosteri*
Taiwharu	Giant kōkopu	*Galaxias argenteus*

Part B
Shellfish Species

Name in Māori	Name in English	Scientific name
Pipi/Kākahi	Pipi	*Paphies australe*
Tuaki	Cockle	*Austrovenus stutchburgi*
Tuaki/Hākiari, Kuhakuha/Pūrimu	Surfclam	*Dosinia anus, Paphies donacina, Mactra discor, Mactra murchsoni, Spisula aequilateralis, Basina yatei,* or *Dosinia subrosa*
Tuatua	Tuatua	*Paphies subtriangulata, Paphies donacina*
Waikaka/Pūpū	Mudsnail	*Amphibola crenata, Turbo smaragdus, Zedilom* spp

Appendix 5: Bird Species in the Park

SPECIES[1]	MAORI NAME	STATUS	THREAT CLASSIFICATION[2]	TAONGA SPECIES[3]	HABITATS
Banded dotterel	Tutriwhatu	Endemic	Gradual decline	No	Riverbed
Black-billed gull		Endemic	Serious decline	No	Riverbed
Brown creeper	Pipipi	Endemic	Not threatened	No	Forest
NZ scaup	Papango	Endemic	Not threatened	No	Lakes
Rock wren	Tuke	Endemic	Nationally vulnerable	No	Alpine
Bellbird	Korimako	Endemic	Not threatened	Yes	Forest
Black-fronted tern	Tarapiroe	Endemic	Nationally endangered	Yes	Riverbed
Blue Duck	Whio	Endemic	Nationally endangered	Yes	Forest, river
Brown kiwi (Haast)	Tokoeka	Endemic	Nationally critical	Yes	Forest, alpine
SI fantail	Piwakawaka	Endemic	Not threatened	Yes	Forest
Grey warbler	Riroriro	Endemic	Not threatened	Yes	Forest
Kea	Kea	Endemic	Nationally endangered	Yes	Alpine
Long-tailed cuckoo	Koekoea	Endemic	Gradual decline	Yes	Forest
Yellowhead	Mōhua	Endemic	Nationally endangered	Yes	Forest
Morepork	Ruru koukou	Endemic	Not threatened	Yes	Forest
NZ wood pigeon	Kererū	Endemic	Gradual decline	Yes	Forest
NZ Falcon 'eastern'	Kārearea	Endemic	Gradual decline	Yes	Forest, open
NZ shoveller	Kuruwheku	Endemic	Not threatened	Yes	Lakes, swamps
Paradise shelduck	Putakitaki	Endemic	Not threatened	Yes	Open, swamps
SI fernbird	Mata	Endemic	Sparse	Yes	Swamps
SI Kākā	Kākā	Endemic	Nationally endangered	Yes	Forest
SI rifleman	Titititpounamu	Endemic	Gradual decline	Yes	Forest
SI robin	Kakaruai	Endemic	Not threatened	Yes	Forest
SI tomtit	Miromiro	Endemic	Not threatened	Yes	Forest
Tui	Tui	Endemic	Not threatened	Yes	Forest
Yellow-crowned parakeet	Kākāriki	Endemic	Gradual decline	Yes	Forest
SI pied oystercatcher	Torea	Native	Not threatened	No	Riverbed

[1] From the recognised *New Zealand Bird Name Database*

[2] As listed in Hitchmough et al 2007

[3] As listed in the Ngāi Tahu Claims Settlement Act

1

SPECIES[1]	MAORI NAME	STATUS	THREAT CLASSIFICATION[2]	TAONGA SPECIES[3]	HABITATS
Silvereye	Tahou	Native	Not threatened	No	Forest
Spotless crake		Native	Sparse	No	Swamps
Spur winged plover		Native	Not threatened	No	Open, riverbed
Welcome swallow		Native	Coloniser	No	Riverbed, open
White-faced heron		Native	Not threatened	No	Lakes, riverbed
Australasian harrier	Kāhū	Native	Not threatened	Yes	Riverbed, open
Black shag	Koau	Native	Sparse	Yes	Riverbed
Grey duck	Parera	Native	Nationally endangered	Yes	Lakes, swamps
Grey teal	Tete	Native	Not threatened	Yes	Lakes
Kingfisher	Kotare	Native	Not threatened	Yes	Riverbed
Little shag	Koau	Native	Not threatened	Yes	Riverbed
Pied shag	Koau	Native	Not threatened	Yes	Riverbed
Pied stilt	Pōaka	Native	Not threatened	Yes	Lakes
Pipit	Pīhoīhoī	Native	Not threatened	Yes	Open
Pukeko		Native	Not threatened	Yes	Swamps
Black-backed Gull	Karoro	Native	Not threatened	Yes	Open
Shining cuckoo	Pipiwharauroa	Native	Not threatened	Yes	Forest
Red-billed gull	Tarapunga	Native	Gradual decline	No	Riverbed, lakes
Canada goose		Introduced	Not threatened	No	Riverbed, lakes, open
Chaffinch		Introduced	Not threatened	No	Forest
Dunnock		Introduced	Not threatened	No	Open
Goldfinch		Introduced	Not threatened	No	Open, forest
Greenfinch		Introduced	Not threatened	No	Forest, open
House sparrow		Introduced	Not threatened	No	Open
Magpie		Introduced	Not threatened	No	Open
Mallard	Pārera	Introduced	Not threatened	No	Lakes, riverbed
Redpoll		Introduced	Not threatened	No	Forest, open
Skylark	Pīhoīhoī	Introduced	Not threatened	No	Open
Song thrush		Introduced	Not threatened	No	Open forest
Starling		Introduced	Not threatened	No	Forest, open
Yellowhammer		Introduced	Not threatened	No	Open, forest

2

Appendix 6: Taonga plant species

MAORI NAME	COMMON NAME	SCIENTIFIC NAME
Akatorotoro	White rata	*Metrosideros perforata*
Aruhe	Fernroot (bracken)	*Pteridium esculentum*
Horoeka	Lancewood	*Pseudopanax crassifolius*
Houhi	Mountain ribbonwood	*Hoberia lyalli* and *H. glabata*
Kahikatea	Kahikatea	*Dacrycarpus dacrydioides*
Kamāhi	Kamāhi	*Weinmannia racemosa*
Kāpuka	Broadleaf	*Griselinia littoralis*
Karaeopirita	Supplejack	*Ripogonum scandens*
Karamū	Coprosma	*Coprosma robusta, Coprosma lucida, Coprosma foetidissima*
Kātote	Tree fern	*Cyathea smithii*
Kiekie	Kiekie	*Freycinetia baueriana* subsp. *banksii*
Koromiko/Kokomuka	Koromiko	*Hebe salicifolia*
Kotukutuku	Tree fuchsia	*Fuchsia excorticata*
Mānuka Kahikatoa	Tea-tree	*Leptospermum scoparium*
Māpou	Red matipo	*Myrsine australis*
Matai	Matai/black pine	*Prumnopitys taxifolia*
Miro	Miro/brown pine	*Prumnopitys ferruginea*
Pātōtara	Dwarf mingimingi	*Leucopogon fraseri*
Pōkākā	Pōkākā	*Elaeocarpus hookerianus*
Rātā	Southern rātā	*Metrosideros umbellata*
Rautāwhiri/Kōhūhū	Black matipo/mapou	*Pittosporum tenuifolium*
Rimu	Rimu/red pine	*Dacrydium cupressinum*
Taramea	Speargrass, spaniard	*Aciphylla* spp.
Tawai	Beech	*Nothofagus* spp.
Ti rakau/ti kōuka	Cabbage tree	*Cordyline australis*
Tikumu	Mountain daisy	*Celmisia spectabilis* and *C. semicordata*
Toatoa	Mountain toatoa, celery pine	*Phyllocladus alpinus*
Toetoe	Toetoe	*Cortaderia richardii*
Tōtara	Totara	*Podocarpus totara*
Tutu	Tutu	*Coriaria* spp.
Whaririki	Mountain flax	*Phormium cookianum*
Wī	Silver tussock	*Poa cita*
Wiwi	Rushes	*Juncus* all indigenous *Juncus* spp. and *J. maritimus*

1

List of the areas controlled due to the invasive animals within the Plan

Appendix 7: Control of introduced animals

ANIMAL PEST	DISTRIBUTION	AREAS TREATED	ACTION
Possum	Throughout park.	Ruth Flat, Upper Siberia, Upper Waipara.	Sustained ground control at 2-3 year frequency to maintain low possum densities to protect *Libocedrus bidwillii* (Mountain cedar).
		West Matukituki	Sustained ground control, annually to maintain low possum density in red beech forest around Aspiring Hut to protect SI robin/kakaruai.
		Dart Valley	Sustained ground control to maintain low possum densities, and aerial 1080 control of rat populations during beech mast years to protect indigenous vegetation and improve breeding success of native birds, especially kākā and mōhua.
		Haast Valley	Sustained possum control using aerial and ground methods at 3-4 year frequencies. For ecosystem protection.
		Okuru Valley (upstream to Ngatau confluence)	Sustained possum control using aerial and ground methods at 3-4 year frequencies. For ecosystem protection.
		Turnbull Valley (upstream to Mueller confluence)	Sustained possum control using aerial and ground methods at 3-4 year frequencies. For ecosystem protection and buffer for Haast Tokoeka kiwi sanctuary aerial rat control.
		Arawhata Valley (upstream to McArthur Flat)	Sustained possum control using aerial and ground methods at 3-4 year frequencies. For ecosystem protection.
		Waipara Valley	Sustained possum control using aerial and ground methods at 3-4 year frequencies. For ecosystem protection.
		Waiatoto Valley (lower south side of valley upstream to Magic Water)	Sustained possum control using aerial and ground methods at 4-7 year frequencies. For ecosystem protection and buffer for Tokoeka kiwi sanctuary aerial rat control.
Tahr	Wills Valley, Young Range tops	Same	Sustained control using Judas tahr and search/ destroy operations in known hotspots. 4-6 operations/year. Eradication in area west of Young Range (~35,000 ha) to create buffer zone.
	Isolated sightings of migrant or illegally released animals.	Southern Exclusion Zone (SEZ) includes most of park except southern-most corner	Removal from SEZ, primarily using sentinel/Judas tahr and search/destroy (in known hotspots); 4-6 operations per year.
	Isolated sightings of migrant or illegally released animals.	Forgotten River, Dart Valley, Joe River	"Risk Zone", area south of SEZ; eradication using periodic aerial checks 2 times per year.

1

ANIMAL PEST	DISTRIBUTION	AREAS TREATED	ACTION
Goat	Dart Valley, Rees Valley, West Matukituki	Same	Reduction to zero density in Dart/Rees/ and West Matukituki using Judas goats, search/destroy and ground hunters; 3-4 aerial operations, 4-6 ground operations per year.
Chamois	Throughout park	Same	Control through commercial helicopter operations and recreational hunting.
Red deer	Throughout park	Same	Control through commercial helicopter operations and recreational hunting.
Fallow deer	Found adjacent to park in Humboldt Mountains. Range not extending.	Same	Control through recreational hunting.
Whitetail deer	Dart Valley and tributaries, Rees Valley.	Same	Control through commercial operations and recreational hunting.
Rabbits	Wilkin, East Matukituki, West Matukituki	Same	Low levels; periodic control when required.
	Some sites adjacent to park in Dart Valley, eg. Dans Paddock and Sylvan bush edge.	Same	Low to moderate levels. Periodic control when required. RHD not present.
Hares	Throughout park.	None	None
Canada geese	Low numbers throughout; primarily Dart Valley.	None	Control may be considered but little threat to park values at present.
Pigs	Not thought to be present		Eradication if encountered.
Magpies	All eastern catchments	None	Periodic control of nuisance birds around huts if necessary.
Mustelids	Stoats throughout park. Ferrets in areas adjacent to farmland eg Lower Dart Valley.	Haast Pass Highway, Young Valley, West Matukituki, Dart Valley, Haast Range (Tokoeka sanctuary)	Sustained control (kill traps) to protect indigenous bird populations such as kākā, mōhua, SI robin/ kakaruai, Whio/blue duck and tokoeka/kiwi).
Cats	Throughout park. Possibly limited by altitude.	Various	By-catch of possum and goat ground hunting operations.
Rats	Throughout park, though low numbers in upland valleys where cold winters probably limit population levels. Irruptive following beech masts.	Dart and tributaries, Caples Valley (Operation Ark), Young Valley, Haast Pass Highway, West Matukituki, Haast Range (Tokoeka Sanctuary).	Maintenance and/or reactive control of rats to protect mōhua, kākā and whio (Operation Ark), South Island robin/kakruai (West Matukituki), whio and mōhua (Young Valley) and kiwi (Haast tokoeka Kiwi Sanctuary).

ANIMAL PEST	DISTRIBUTION	AREAS TREATED	ACTION
Mice	Throughout park. Significant population increases following beech mast.	None	Population levels monitored. Impacts on litter invertebrates recognised. No effective control measures.
Hedgehogs	Reportedly in northern area of park, possibly at high altitude.	None; by-catch of possum and rat trapping.	Some distribution and impact monitoring may be of benefit in areas with rare native lizards, insects and ground nesting birds, eg. dotterel.
Pest fish		Not present	Eradicate if encountered.

3

List of the areas controlled due to the invasive plants within the Plan

Appendix 8: Control of introduced plants

WEED	SITE	ACTION
Lindley false spiraea (*Sorbaria tomentosa*)	Slipstream Gully	Eradication - aerial and ground control (operations initiated in March 2002).
Sycamore (*Acer pseudoplanatus*)	Makarora area - below Young River mouth and near visitor centre	Sustained control using ground control methods.
Rowan (*Sorbus aucuparia*)	Homestead Creek	Sustained control using ground control methods.
Sweet cherry (*Prunus avium*)	Wills Hut Gates of Haast Burke Flat	Sustained control using ground control methods. Eradicate where possible.
Cotoneaster (*Cotoneaster simonsii C. glaucophyllus*)	Wills Hut Gates of Haast	Sustained control using ground control methods.
Hawthorn (*Crataegus monogyna*)	Dans Flat Cameron Flat	Sustained control using aerial and ground control methods
Crack willow (*Salix fragilis*)	Top Forks Hut upper Haast Valley	Eradication - ground control (operations initiated in January 2002)
Sweet briar (*Rosa rubiginosa*)	Kerin Forks Flat, Siberia Hut, below Crucible Lake, Tiel Creek, Lower Dart Flats, Burke Flat	Sustained control - ground control (operations initiated in January 2002)
Blackberry (*Rubus fruticosus*)	Shelter Rock Hut, Routeburn Flat Hut, North of Pleasant Flat Ridge near Coda Hut, Franklin Hut, Haast Valley	Sustained control using ground control methods
Bittersweet (*Solanum dulcamara*)	South of Rock Burn Hut	Sustained control - ground control (operations initiated in January 2002)
Broom (*Cytisus scoparius*)	Cameron Flat, upper Haast Valley	Manage in accordance with Otago and West Coast Regional Council Pest Management Strategy rules for broom-free areas - ground control.
Plum tree (*Prunus xdomestica*) and Apple tree (*Malus xdomestica*)	Top Forks Hut, Upper Wilkin River, Kerin Forks, Dans Flat, Haast Valley	Eradication - ground control (operations initiated in January 2002)
Ragwort (*Senecio jacobaea*)	Ubiquitous throughout park	Too widespread to control. Biological control agents are a possibility.
Tussock hawkweed (*Hieracium lepidulum*)	Ubiquitous throughout park	Too widespread to control. No suitable management techniques. Biological control agents are a possibility in the future. Protect the short tussock grasslands at Ruth Flat and Theatre Flat as far as possible from human-induced land disturbance that may contribute to spread of hieracium.
Tutsan (*Hypericum androsaemum*)	Haast Valley Waiatoto Valley Okuru Valley	Sustained control

1

WEED	SITE	ACTION
Mouse-ear hawkweed (*Hieracium pilosella*)	Ubiquitous throughout park	Too widespread to control. No suitable management techniques. Biological control agents are a possibility in the future.
King devil hawkweed (*Hieracium praealtum*)	Ubiquitous throughout park	Too widespread to control. No suitable management techniques. Biological control agents are a possibility in the future.
Foxglove (*Digitalis purpurea*)	Ubiquitous throughout park	Too widespread to control
Californian thistle (*Cirsium arvense*) Scotch thistle (*C. vulgare*)	locally in Wills, Haast, Turnbull and Okuru Valleys	Nil
Elder (*Sambucus nigra*)	Gates of Haast	Eradication
Gorse (*Ulex europaeus*)	Haast and Turnbull Valleys (uncommon)	Sustained control
Tree lupin (*Lupinus arboreus*)	Haast Pass (uncommon)	Eradication
Montbretia (*Crocosmia x crocosmiflora*)	Haast Valley (uncommon)	Sustained control

2