

THE LAND SHAPING THE PEOPLE

A cultural look into a new land management scheme
for South Wairarapa

BY
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scheme for South Wairarapa

By
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M I H I

Ko manganui te maunga

Ko Medway te awa

Ko ingarangi te iwi

Ko Isle of Sheppy te motu

No Maidstone ahau

Ko Megan Smart taku ingoa

Tena koutou, tena koutou, tena koutou katoa

My mountain is Mount Manguanui

My river is the River Medway

I am English

I am from the Isle of Sheppy

I lived in Maidstone

My name is Megan Smart

ACKNOWLEDGEMENTS

The last five years have been the most stressful, yet rewarding few years. I hope that these will lead me into many more and I would not have made it through these without the love and support from many.

To Bruno, I would like to express a massive thank you for the years teaching me. For all the guidance, reassuring words, and countless chats, they have all helped in this final year. You have been a great supervisor.

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Finally, to Mum and Dad. I could not have asked for the amount of love and patience you have both given me. But most of, your belief in myself to always achieve better than my best. You keep me grounded and are forever pushing me forward. I thank you both most of all.



Figure 1. WILLOWS
Site image looking into the willow trees, Boggy Pond

ABSTRACT

With this thesis bringing attention to the region of Wairarapa, it will show awareness to the significant cultural and biodiversity that this district holds that makes it such a rich place within *Aotearoa*, New Zealand. With two natural features sitting at their doorsteps, Lake Wairarapa and the Remutaka hillside, this region holds much to preserve and want to save. Māori culture holds countless values of the landscape that can be used to heal the land surrounding the lake, which in turn will heal the people living amongst it. These values are held with great appreciation in the culture, many believe all should live with these values for the land.

This thesis will help in bringing the Te Aranga Māori design principles to the surface so more can live with the land naturally and not just on it. This research will explore how these design principles can be used in bringing the landscape back to its prior state, and working with natural interventions to bring *wahi tapu* into the land and its people. In dealing with the current challenges and goals that present generation live with to make Wairarapa one to grow in and with.

These ideas can generate discussion to how people might live more sustainably with the use of natural systems in the landscape, to the production of natural products. It will also allow for more research topics to be produced from the older ways people used to live with the land. To show the diverse cultures present today, in how others could benefit from the ways and means they used to be. With dealing with present challenges and needs from today's generation as we cannot 'restore' what once was, we have to 'regenerate' a new way of living, that is beneficial for all.

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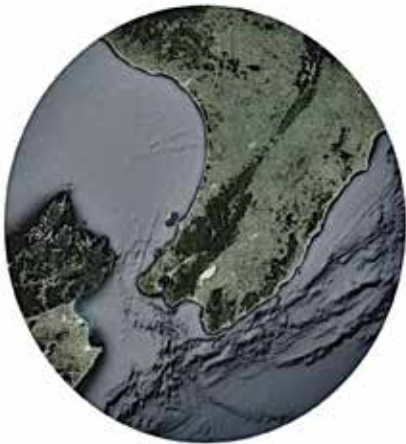
INTRODUCTION

CHAPTER ONE

RESEARCH CONTEXT



Aotearoa, New Zealand



Lower North Island



South Wairarapa Region

This chapter illustrates an outline of research study that has developed over a year of findings located in the Wairarapa region of *Aotearoa*, New Zealand. Within these findings a number of connecting factors have been used to resolve the design scheme into answering the research question set. Oral narratives, Māori cultural beliefs and values of the land, regeneration over restoration, the understanding of the natural systems, and the widespread familiarity of New Zealand’s water bodies entering into difficulty. In bringing attention to these issues the research will link together to emphasize the title ‘the LAND shaping the people’ rather than the people shaping the land. But to live with it as an alternative.

Figure 2. RESEARCH CONTEXT
Images locating the area of the study research, in relation to Aotearoa, New Zealand

1.1

STRUCTURE

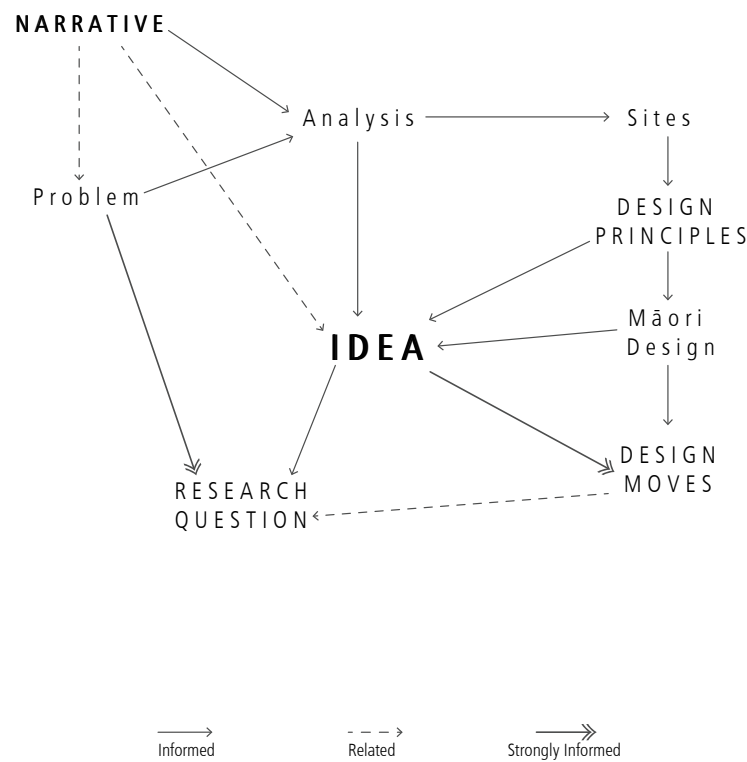


Figure 3. RESEARCH STRUCTURE

This diagram helps to map out the structure to how the elements of the research study interconnect and show the process of how it developed

1.2

PEOPLE SHAPING THE LAND

Change in landscape is a fundamental attribute and humans are not in charge of this change. The earth, is. Conversely, in agricultural landscapes the change occurring here generally is connected towards humans. As humans, we tend to live on land that we do not have to considerable manipulate e.g. we settle in land that is flat. However, if this is necessary, humans will manipulate this land. This necessity to manipulate land is becoming a growing issue around the world, adding to the already obvious subjects of the rise in population and concerns amongst climate change. More and more land is changing in order to suit us humans.

One of these major influences transpiring in New Zealand, is the draining of water bodies such as lakes, lagoons, streams and rivers for agricultural advance. This thesis looks at pushing this problem into a positive, by using the 'land' to 'shape' the people.

The problems mentioned previously are some of the main factors that are going to be analysed throughout this study. With a more depth look towards the land management systems in agriculture, the draining of water bodies and the environmental factor these have on the land. To how these practices lead mixed beliefs about the land as a whole and of New Zealand's current farming culture. By linking these ideas to the discussion of 'regeneration over restoration' to change this view. Focusing upon regenerating what was there and is there now, to meet the current challenges humans are facing today. Rather than trying to restore the land back to what it once was, as this is an impossible proposal to complete. The land and people living on it have changed so much from then to now. The goal is to now design new ways to meet these new challenges and future demands from these old ideals.

1.3

NEW ZEALAND CONCERNS

In the ever developing world, population numbers have and are still becoming a sizable issue, as the statistics below estimates. With the growing concerns of climate change, every designers test is how to plan for the future. Through the change in environment, the space of land is decreasing, (see appendix A). Housing numbers have increased and will continue to increase, correspondingly is the need for amenities to satisfy this growth. Water is one amenity that everyone needs to survive. These problems have affected this amenity to where many streams and rivers in New Zealand are below the line for meeting health and environmental standards. This in turn is affecting the production that can be had for the surrounding land, which sequentially affects the people. What can be done to regenerate the natural system back into working order? How will this affect the adjacent land uses? What measures will have to be taken to meet the health and environmental standards in a positive outcome?

With the decrease in available land, the space to produce adequate resources for the population rise minimise with this. More and more practices are compromising the standard of the product by intensive farming or using chemicals. The rising trend to be clean and green has now influenced many to buy products that are free range and naturally grown. “Currently only 5% of global timber supply comes from sustainable managed, plantation forests” (Greenplan). Design ideas of multi-use spaces have been on the growing trend throughout all disciplines. How can the pine industry do this? Can this resource be substituted?

Year	2012	2013	2014	2015
Population	4,408,100	4,442,100	4,509,700	4,595,700

Figure 4. ESTIMATED RESIDENT POPULATION REGIONAL COUNCIL AREAS, AT 30 JUNE (1996+) Statistics showing the population increase estimate from 2012 - 2015 (Zealand)

ORAL NARRATIVES

This research study has come to life through oral narratives. New Zealand is a culturally diverse country, within this study Māori and Pākehā cultures will be the key influences. From an earlier University project to the Wairarapa, the oral narratives that were spoken while visiting resonated with the researcher personally. These narratives have helped to explain much of the surrounding landscape that was very unfamiliar at first. They also enlightened to how the land was formed or what had previously been, this particularly from the side of the Maori narratives. The differences between the Maori and the Pakeha narratives came into consideration throughout the research in the fact of the feelings of what is told through the narrative. When Māori speak of the land, it is spoken about deeply as if it came from inside of the speaker, showing that there was a connection rather than spoken factually such as from a non-Māori person. A value that has helped influence the title of the research investigation, 'the land shaping the people'. In the understanding that it is, a living being and it is letting the people know what it needs. Using this as a catalyst to what the design approach could evolve into, in relation to what the people require from it. For the final outcome to shift the narrative from the people shaping the land to, the land shaping the people.

1.5

MĀORI CULTURE

The Māori narrative of the creation story describes *Papatūānuku* or mother earth as a living being. She gives the people of the land everything they need. The value behind this is how the people treat her as the living land, is to how they are treated back. One narrative that was mentioned on a visit talked about when the people are unwell, the land the people live on is also unwell. Giving this relationship a meaning of respect towards one another. A value of respect that all landscape architects should have when designing.

Māori culture holds countless values of the landscape that can be used to heal the land, which in turn will heal the people living amongst it. These values are held with great appreciation in the culture. Many believe all should live with these values of the land. As a designer for this study, this is the challenge to tackle by including similar values to the projects final outcome. This research will correspondingly explore how these fundamentals of the land can be used in bringing the land back to its prior state, through bringing attention respect, *kaitiakitanga* and *mauri ora* in the design. In using natural interventions to bring the wahi tapu back to the land and its people, whilst dealing with the current challenges that the present generation live with. Making Wairarapa one to grow in and with.

1.6

RESEARCH INTENTIONS

During this study, some common problems that New Zealand have are addressed. These problems include intensive farming, sustainable living, and unhealthy water ways. This research explores how Landscape Architecture can solve these through natural design processes. This will be tested on sites situated in the Southern Wairarapa region with the guidance of:

Aims

1. To explore and understand the fundamentals the Māori culture hold within their beliefs of the land, specifically 'the land shaping the people'
2. To find development opportunities through the narratives held within the region and natural systems, which will lead to a design framework
3. To regenerate the natural systems of these sites back to a healthy working order

Objectives

To generate a design solution through the regeneration of the past land and apply these to the site at the present situation.

The Te Aranga design principles will aid to produce a natural process to resolving the problems of the site. And to create a place of education to promote *mauri ora* and *kaitianga* through generations.

1.7

RESEARCH QUESTION

In bringing attention to the region of the Wairarapa, it will help to show awareness to the regeneration process. This needs more concentration in managing and engaging the public to what is transpiring around them, how they can change their lifestyle to benefit the region. Situated in the Lower North Island of New Zealand, this research focuses on the agricultural idea of fibre production with the regeneration of old lagoon wetland areas that have been recently classed with an exceptional indigenous biodiversity value from the Wildlands report made on the 'extent and significance of Wairarapa Moana wetlands and Lake Pounui' in March 2013 (Reeves). With two natural features sitting at their doorsteps, the Lake and the *Remutaka* hillside, this area holds much to preserve and save.

Research Question

'Through the understanding of peoples values, beliefs and the land they live on, how can the form of the land prompt design opportunities in assisting the regeneration of the natural systems'

APPROACH AND METHOD

A secondary theme of the document is understanding narratives, from Māori and Pakehā cultures. This will set the beginning of the design and will be laced throughout the design journey in helping to influence the design decisions to overall tell a new narrative. The design principles which are set off the design moves are understood and then applied from the theory covering regeneration, sustainable land management, fibre production and landscape as a tool.

Two types of mapping will be applied throughout, to receive the best possible information at the appropriate stages. The initial research mapping will be taken at a macro scale for site background and will move to a closer scale of micro when mapping the individual sites. Conclusions are then drawn from the research stage.

The tools used in the design stage will be through iterative experimentation process and reflections. This will allow for testing case studies and precedents into the site situations for the best outcome. Conclusions will be drawn from these outcomes to see ways of potential improvement. Enhancing the likelihood of answering the design question.

The research approach will follow a linear process with a division/investigative steps. Working in this manner, the study will generate the best results and understandings of each step taken throughout the thesis timeframe. For example, this thesis will be working with narratives which will lead to numerous sites across the region and around the lake. In using the division/investigative process to analyse these sites, they can then be evaluated to which are the best spots for continuing to test. (Refer to Fig 3.). Followed on with testing through iterations for the best solutions. Reading case studies from similar situations that have been used in the field will be used to help apply different tactics to the specific sites. Conclusions drawn from these case studies will engage the study to a higher level in developing new ways to challenge the outcome.

W A I R A R A P A M O A N A

Lake Wairarapa is the third largest lake in the North Island, with many significant water bodies surrounding the edges, the name given to this is Wairarapa Moana. The Wairarapa region lays within a valley bordered by the *Remutaka* hills and the Aorangi ranges. The Wairarapa fault is located to the western of the lake edge, with the most recent earthquake in 1855 which changed much of the landscape that can be seen today, a result of a 1m rise in land. The region itself is very flat and with any small change the eastern shore can shift by as much as a half a kilometre. In the addition of the Europeans arrival in the 1840's came much change with them.

Land leasing ideas changed with new laws being created, the way the land was treated changed and the region itself transpired into a new way of living. Arguments grew between the Māori people and the Pākehā people because of the land shifting from the earthquake. This shift changed where the boundaries begun and ended surrounding the lake from tidal swings. These disputes continued for a number of years with many court battles, when finally the chiefly gifting of the lake was handed over to the Europeans from the Māori owners. This was an act of grace as the land was not meant to be fought over. Today the Iwi parties of the Wairarapa region are slowly reclaiming back the land that was given. So that the focus can be on healing the land and bringing it back to a working form that will benefit them and their people living in the area. In addition to bringing back the land they grew up on, back into their blood as the land is their blood line.

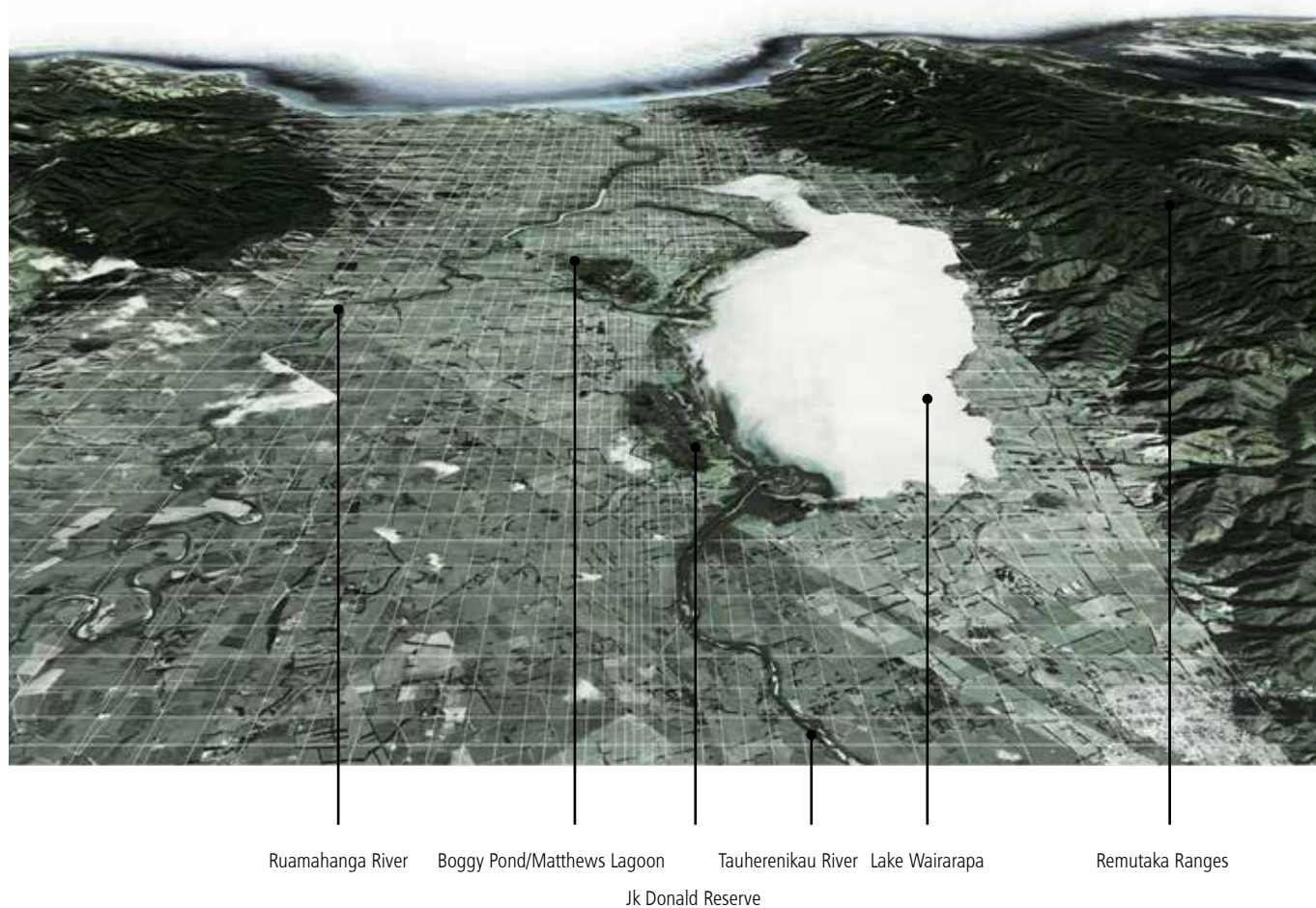


Figure 5. WAIRARAPA MOANA
Image outlying the water bodies included in the Wairarapa Moana, Southern region of the Wairarapa

W A I R A R A P A M A N A G E M E N T T E A M

Within the course of working in the Wairarapa district in University projects, a number of people have shared their knowledge and resources. This investigation was lucky enough to be introduced to the Wairarapa management team because of this. The team is focused in projects around the Wairarapa Moana, (Lake Wairarapa, Lake Oneke, and the Ruamahanga River joining these two lakes upstream to the Tuhiterata Bridge, Oneke Spit, and their surrounding wetland. With objectives to protect and restore ecology, spiritual identity, recreation and cultural opportunities since the project beginning in 2008.

The Wairarapa Management team is a collaborative, multi-agency project involving Ngati Kahungunu ki Wairarapa, Rangitane o Wairarapa, Papāwai Marae, Kohunui Marae, Greater Wellington Regional Council (GWRC), South Wairarapa District Council (SWDC) and the Department of Conservation (DOC). The involvement of landowners and engagement of the wider community is an important part of the project.

With the range of contacts to reach in this team, the study has access to land data, narratives, personal knowledge, council papers, and community views. This has added in providing a closer step into the best design outcome.

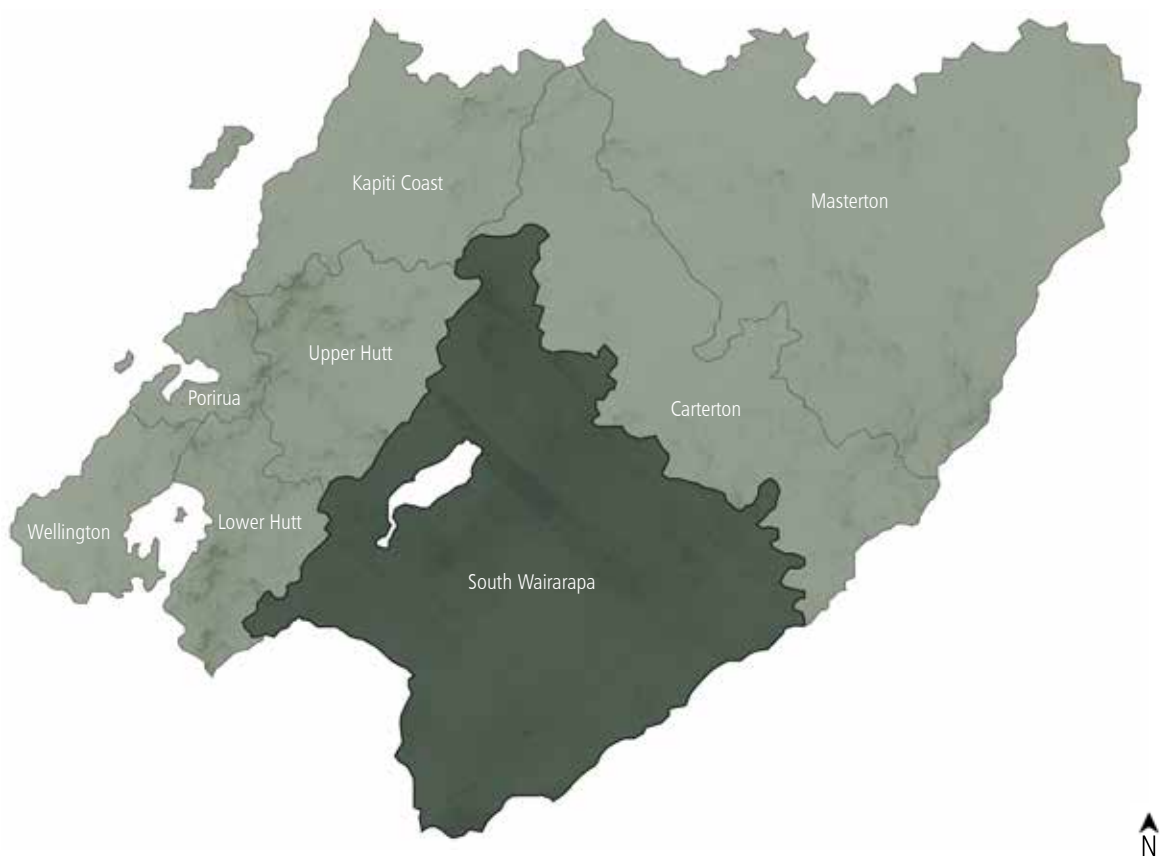


Figure 6. LOWER NORTH ISLAND TERRITORIAL DISTRICTS
Map of council districts and highlighted district in relation to the thesis

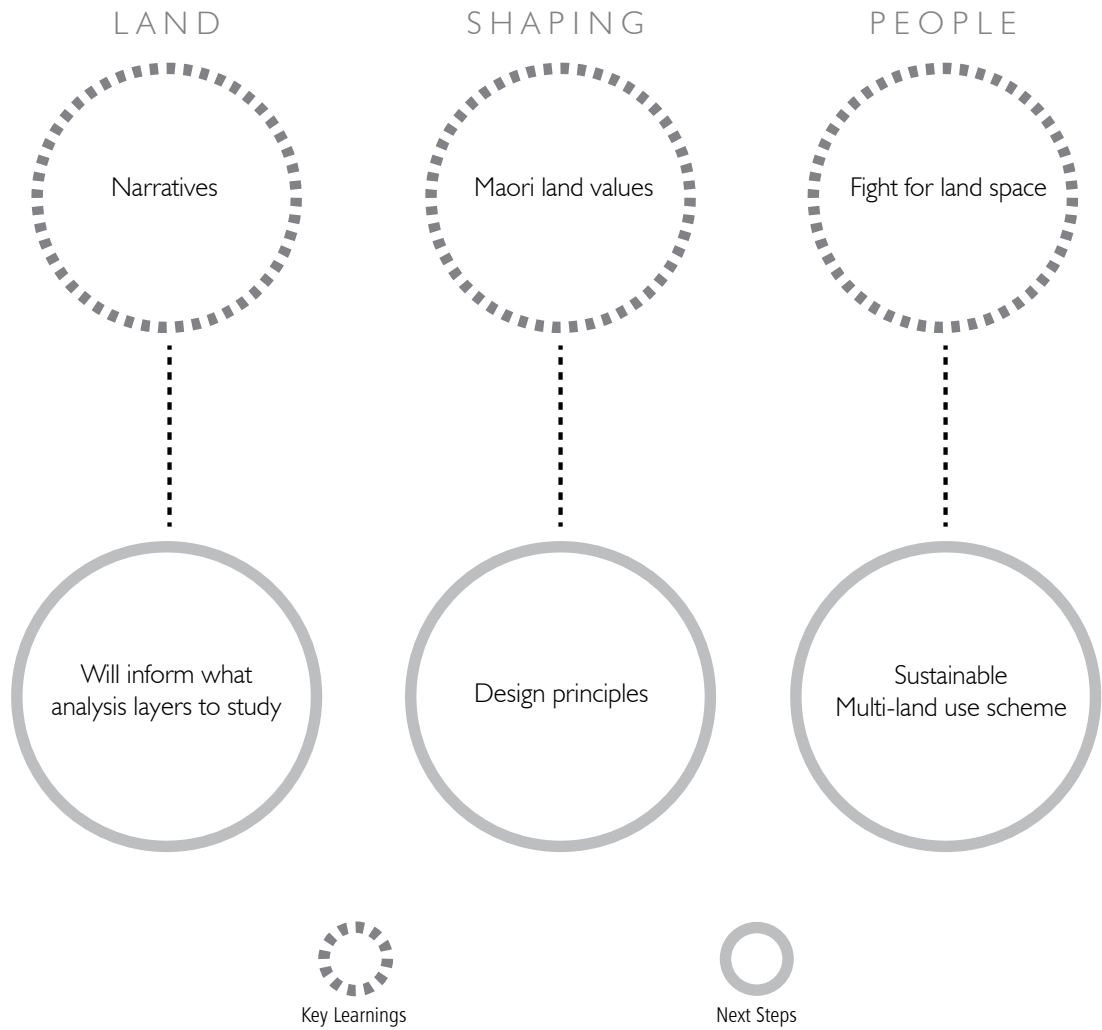


Figure 7. CONCLUSION DIAGRAM 1
Diagram showing the key learning points from the chapter and the next steps to take

1.11

REFLECTIONS

This thesis looks to cover the problems in this chapter to generate a design on how people might live more sustainably, through the use of natural systems. In working with the management team and the local iwi, this research has rich access to a range of different resources as mentioned in 1.11. These resources will aid the thesis structure in critically analysing each step to best answer the question set, ‘Through the understanding of peoples values, beliefs and the land they live on, how can the form of the land prompt design opportunities in assisting the regeneration of the natural systems’.

Next steps in moving forward is to understand the Māori land values from their cultural beliefs and apply these into design principles. To base the study in developing what the land needs are first, before the people.

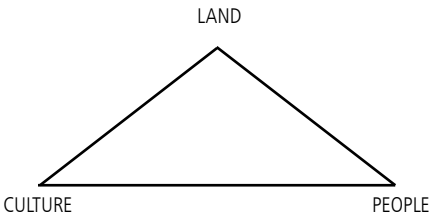


Figure 8. LAND, CULTURE, PEOPLE PYRAMID
Diagram showing the land coming first, with the use of culture and people

MĀORI CULTURAL INFLUENCES

CHAPTER TWO

This chapter explains the Māori culture and the values that are held within its beliefs. To comprehend many of the myths and narratives associated with the Wairarapa region specifically, an understanding of the creation story through the local iwis must be appreciated first. This chapter also looks into how the European arrivals had greatly changed the traditional values of the culture. This change was correspondingly visible within the landscape and how it was treated to the present day. In order to combat this change a study of the Māori values is undertaken, to then translate these through design principles to inform the final outcome of the research.

2.0

MĀORI GENEALOGY

The Māori creation story of the universe as some understand it, to be the same across the country. However, this is not the case. Depending on where one is in *Aotearoa*, the story slightly shifts in concepts, but the main notions of this nevertheless, does not change through place to place. This notion is the idea that all living beings came from nature. This is from the creation narrative of *Ranginui (Rangi)*, the sky father, and *Papatūānuku (Papa)*, the earth mother. The earth mother gave life to the world and bore 70 children, all male. The closeness and embrace of the parents *Rangi* and *Papa*, affected the universe. Nothing would grow as there was no light and no knowledge. "After much discussion and the occasional glimpse of what it was like in the 'outside' world they decided to separate the parents" (Grant). The separation of the two obtained into being *Te Aomarama*, the world of light. Where there was now room to grow and succeed. An example of change in narrative across the country is from a story that was told by an iwi member from the Ngāti Kahunnuga tribe. This version of the narrative of the separation of *Rangi* and *Papatūānuku* was described as a tragic event. In that their arms were linked together, when they separated they shed blood, which is why people see red in the mornings and the evenings, when the sky is separates from the land.

The characterisation of creation is fundamental to the holistic worldview of Māori; all life forms are related through *whakapapa* and people come from 'nature', belonging to the land as *tangata whenua*, people of the land, and relating to the land as part of it. This is why the earth, *papa*, is related to a mother. She gave life to Māori people which gave Māori life. As an appreciation to this, when taking from the earth, we also have to give back. When cutting a tree down, gratitude has to be given to *Tane*, god of the forest, before starting and all unused materials is returned back to the land. This is so it can ensure the bounty of nature to be abundant and healthy.

2.1

MĀORI VALUES

The Māori values of the land are then closely related to the genealogy of the people, in that the values held for the land are represented to how they live within this universe. In the sense that they live 'with' the land and treat it as a higher power than themselves. It is their mother, she provides the resources they need to live healthily. The Māori culture also has a strong belief in *mauri ora*, wellbeing of the land itself. It is said that to look at the health of the people, to look to the land they live on. If the land is mistreated or healthy then the people are unhealthy as penance for this. Hence the reasoning to showing respect with the prayer before something is taken from the land. Which correlates back to the notion that a Māori person is looking back at themselves when they are looking at the land. In order to heal the person, the land must be healed first.

This respect and caring for the land is a notion many Landscape Architects would have embedded in them and a handful of other organisations such as Greenpeace, and World Wide Fund for Nature (WWF). But this is where the notion has stopped in this generation. These values of respect and care could be a new approach into educating people to what they do has a direct affect to the environment. Could Landscape Architecture be the profession to show this message through design ideas?

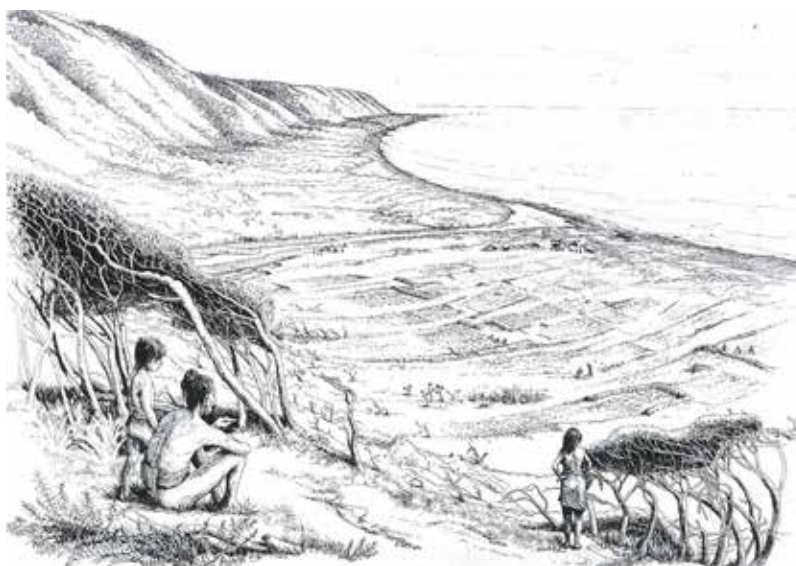


Figure 9. MĀORI GARDENS
An artist impression of the gardens and village site, Palliser Bay

2.2

MAURI ORA

From the Māori perspective, *mauri ora* is the vision of human well-being. To heal someone, is to heal the person as a whole. 'It is the vehicle that drives our ability to love and care for ourselves and our families, to develop creative solutions in all aspects of our life, the very essence that gives us purpose, conviction, and motivation' (Wellness). In this quote, 'to develop creative solutions in all aspects of life' the importance of seeking creative ideas that can be embedded in our everyday life will be core value to be tested. Using a creative solution to benefit what the land needs it to happen to benefit all. In the matter of the wellness of the land, it works hand in hand with the well-being of the humans living amongst it. And to heal one's self as a whole, the land has to be healed as a whole too. This value is something that will help define design decisions, by focusing on healing the landscape as a whole region. In doing this through the use of natural processes which will provide durable and sustainable design outcomes for the future of the region.

2.3

KAITIATANGA

'It is from *mauri* and *whakapapa* that the concept and practice of *kaitiakitanga* encompasses guardianship, preservation, conservation and protection. In its simplest form *kaitiakitanga* is the responsibility to care for the physical, ecological and spiritual well-being of a place or resources to ensure harmony within the environment and protection against elements that can cause permanent imbalance' (Grant). Traditionally the Māori culture believes there is a deep kinship linking humans and the natural world. The growing interest in this ideal is surfacing today as many tribes are working to restore their environment and their culture (Royal). *Kaitiaki*, is a guardian. This can be a group or a person that cares for an area of land. Landscape architects could be seen as this. The idea that this value will help influence the design moves made in this research study to help regenerate the environment through a natural manner, to then initiate the regeneration of the culture through traditional harvesting ideas. For the sense to bring back the respect and values towards the land for the people who live on it. The people on the land have a guardianship towards keeping it healthy so it flourishes.



This is another value that will help aid answering the research study by providing a basis of what to make the design decisions about, as this includes natural processes, community involvement, and general well-being for the land.

TE ARANGA PRINCIPLES

Māori culture and identity highlights *Aotearoa's* point of difference in the world and offers up significant design opportunities that can benefit us all. The Te Aranga Māori Design Principles are a set of outcome-based principles founded on intrinsic Māori cultural values and designed to provide practical guidance for enhancing outcomes for the design environment. The principles have arisen from a widely held desire to enhance mana whenua presence, visibility and participation in the design of the physical realm (Manual). Māori culture and the identity the people hold within *Aotearoa* opens a point of difference within the world, and offers significant design opportunities that can not only benefit us all but Landscape Architects in their design challenges. The Te Aranga Māori Design Principles are a set of outcome based principles drafted from the understandings of the cultural values. They provide a practical direction for enhancing outcomes for the design environment.

The principles are a beneficial tool to use in this research study as they break down the principle into design attributes that could be applied directly to Landscape Architectures current practices. Most importantly, they are broken down through the different cultures. The table in figure 9. starts with the Māori word, which links any non-Māori to the culture indirectly in sharing the word. This word is then decoded into the English translation, giving it direct connection to non-Māori people as they understand the meaning of the word, linking the cultures. This sense of connection is then embedded in the reader, so as it reads on the applications and attributes become more meaningful and relatable. Because the reader understands the back story they can make an informed decision about how it can be used and why it is being used instead of previous practices.

TE ARANGA MĀORI DESIGN PRINCIPLES

	Nga Hua / Outcome	Ahuatanga / Attributes	He Taurea / Application
MANA Rangahau Authority 	The status of iwi and hapū as mana whenua is recognised and respected	<ul style="list-style-type: none"> Recognises Te Tiriti o Waitangi / The Treaty of Waitangi and the 202 Ki. Acknowledges Teiriti framework for Treaty Partnerships in 21st Century Aotearoa New Zealand as the basis for an relationships performing development Provides a platform for working relationships where mana whenua values, world views, tikanga, cultural narratives and visual identity can be appropriately expressed in the design environment High quality Treaty based relationships are fundamental to the application of the other Te Aranga principles 	<ul style="list-style-type: none"> The engagement of high level Treaty based relationships with mana whenua is essential prior to treating design approaches and will deliver the opportunities for design outcomes Supported to identify any priority mana whenua groups as well as wider mana whenua interests in any given development
WHAKAPAPA Names & Naming 	Māori names are celebrated	<ul style="list-style-type: none"> Recognises and celebrates the significance of mana whenua ancestral names Recognises ancestral names as entry points for exploring and honouring tikanga, historical narratives and customary practices associated with development sites and their ability to enhance sense of place connections 	<ul style="list-style-type: none"> Mana whenua consultation and research on the use of correct ancestral names, including macrons Recognition of traditional place names through signage and way-finding Use of appropriate names to inform design processes through careful attention to naming
TOHU The Wider Cultural Landscape 	Mana whenua significant sites and cultural landmarks are acknowledged	<ul style="list-style-type: none"> Acknowledges a Māori world view of the wider significance of tohu / landmarks and their ability to inform the design of specific development sites Supports a process whereby significant sites can be identified, managed, protected and enhanced Celebrates local and wider unique cultural heritage and community characteristics that reinforce sense of place and identity 	<ul style="list-style-type: none"> Recognition of tohu, including wahi tapu, marunga, wahi, puna, mahinga kai and ancestral karanga Allows whānau connection to significant sites to be created, preserved and enhanced Wider cultural landmarks and associated narratives able to inform building / spatial orientation and general design responses Heritage trails, markers and interpretation boards
TAIAO The Natural Environment 	The natural environment is protected, restored and / or enhanced	<ul style="list-style-type: none"> Sustains and enhances the natural environment Local flora and fauna which are familiar and significant to mana whenua are key natural landscape elements within urban and / or modified areas Natural environments are protected, restored or enhanced to levels where sustainable mana whenua harvesting is possible 	<ul style="list-style-type: none"> Re-establishment of local biodiversity Creating and connecting ecological corridors Planting of appropriate indigenous flora in public places, strategies to encourage native planting in private spaces Selection of plant and tree species as seasonal markers and attractors of native bird life Establishment and management of traditional food and cultural resource trees allowing for active kaiākitanga
MAURI TU Environmental Health 	Environmental health is protected, maintained and / or enhanced	<ul style="list-style-type: none"> The wider development area and all elements and developments within the site are considered on the basis of protecting, maintaining or enhancing mauri The quality of air, whenua, ngahere and air are actively monitored Water, energy and hospital resources are conserved Community wellbeing is enhanced 	<ul style="list-style-type: none"> Daylighting, restoration and planting of waterways Contaminated areas of soil are remediated Rainwater collection systems, grey-water recycling systems and passive solar design opportunities are engaged in the design process Hard landscape and building materials which are locally sourced and of high cultural value to mana whenua are explored in the design process
MAHI TOI Creative Expression 	Iwi/hapū narratives are captured and expressed creatively and appropriately	<ul style="list-style-type: none"> Ancestral names, local tohu and iwi narratives are creatively re-inscribed into the design environment including landscape, architecture, interior design and public art Iwi / hapū motivated design professionals and artists are appropriately engaged in such processes 	<ul style="list-style-type: none"> Mana whenua assist in establishing design consortia which are equipped to translate iwi/hapū cultural narratives into the design environment Civic / shared landscapes are created to reflect local iwi/hapū identity and contribute to sense of place Iwi/hapū narratives are re-inscribed in the environment through public art and design
AHI KĀ The Living Presence 	Iwi/hapū have a living and enduring presence and are secure and valued within their role	<ul style="list-style-type: none"> Mana whenua live, work and play within their own role Acknowledges the post Treaty of Waitangi settlement environment where iwi living presences can include customary, cultural and commercial dimensions Living iwi/hapū presences and associated kaitiaki roles are resumed within urban areas 	<ul style="list-style-type: none"> Access to natural resources (swimming species, mahinga kai, waterways, etc) facilitates, maintains and / or enhances mana whenua ahi kā and kaiākitanga Civilian joint venture developments ensure ahi kā and sense of place relationships are enhanced Iwi/private sector joint venture developments enhance employment and ahi kā relationships

These principles will add to the level of cultural depth for the design. They will challenge the outcomes to produce viable opportunities while working in answering the research question. They will aid the design in working through challenges that are used in the testing stages to analysis what is/not working, to resolve a final outcome. They will also allow a connection to be formed through the designer and the people the design is for. To work in showing what has been said “a Māori face looking back at you, rather than a white man’s face”.

Figure 10. TE ARANGA PRINCIPLES
Table explaining the Māori design principles. Name, meaning, attributes and applications

2.5

REGIONAL SYMBOL

After a site visit half way through the year, a thought came to the researcher while travelling over the *Remutakas*. The Wairarapa region could be thought as a Māori marae. Each part of this meeting house has a name and a meaning attached to this, and together provide a place for iwi to gather. The region could be seen in this same manner, in that each part plays an important part in the system.

Firstly, the *wharenui* (house) is the region as a whole. It is made up of the community connections between towns, it represents the iwi tribes within this area, where they meet and trade together, and is somewhat similar in the past where the iwi tribes would connect in allied forces. *Tahuhu* (ridgepole) is the centre of the *wharenui*, the backbone to the life source of the building. This is the water bodies where food can be gathered, recreational activities, travel, and trade. Without this there would be an unsuccessful region. *Heke* (rafters) this is the agriculture and the land surrounding the water bodies. Without the lake, or ridgepole the rafters would be functionless. Without the lake the land surrounding would not be productive. Off the *heke* is the *pou pou* (the ancestor carvings) is the ranges surrounding the flat plains. In the meeting house it is the ancestors who are watching over their loved ones, the ranges act as these ancestors looking down and protecting the region from outsiders.

In the ideas of a house structure, if one element was not present or under pressure the rest of the house will fail (i.e. a rotten centre pole puts the whole house to be structural unsound). In the case of the Wairarapa, the people are putting pressure on the land by draining water bodies, intensive farming, physically altering river paths or mistreating the land, then the region fails because of these. Giving the region an unproductive and unhealthy landscape.

This thesis works to balance out the elements in this narrative to give the region back life and work in bringing a success in economic value, recreational value, cultural value and environmental value because of these.

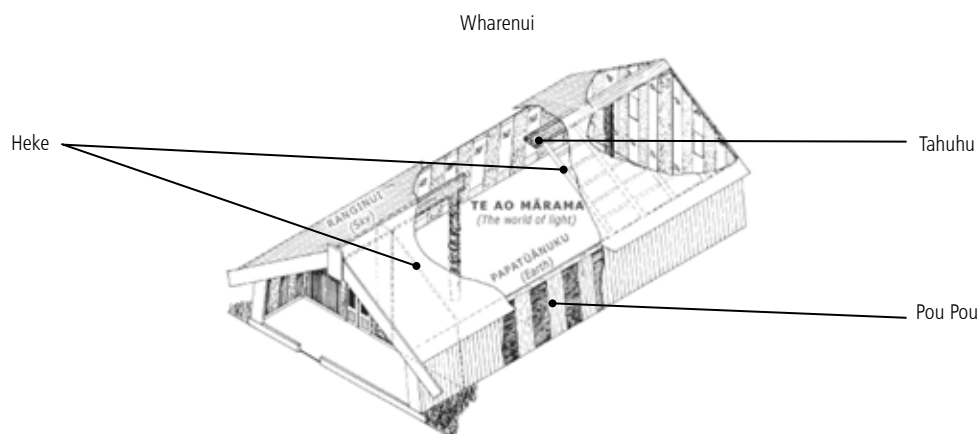


Figure 11. MAORI MEETING HOUSE DIAGRAM
Diagram showing the different elements which make up the meeting house

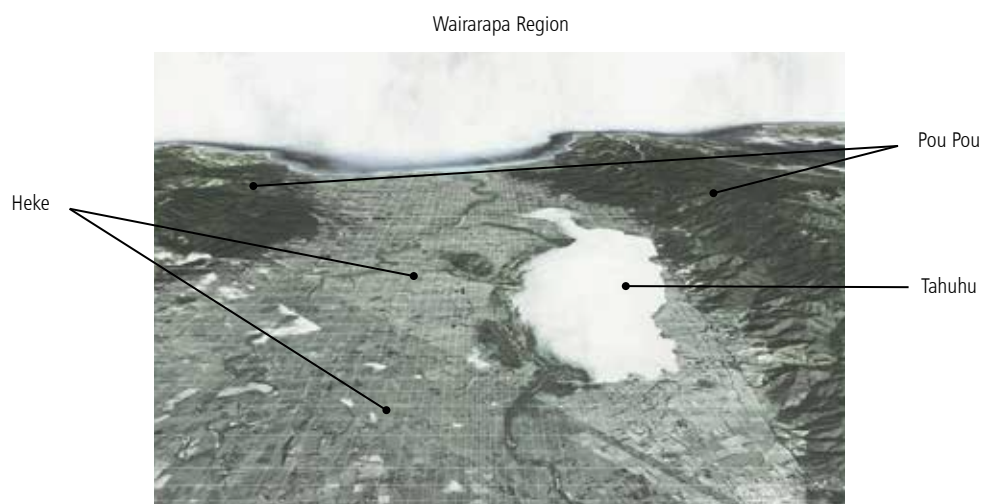


Figure 12. WAIRARAPA REGIONAL VIEW
Image showing the connection the region has to the elements of the meeting house

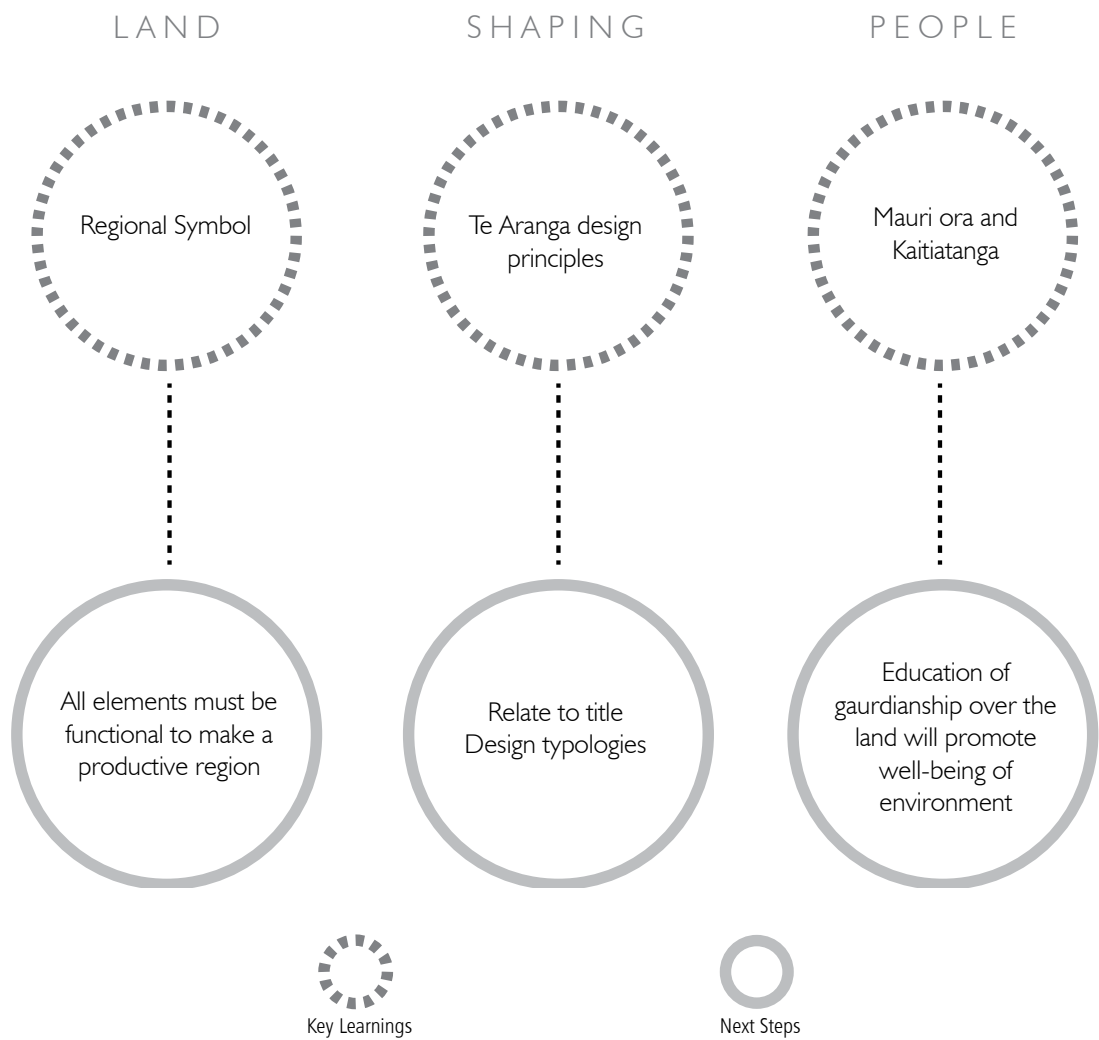


Figure 13. CONCLUSION DIAGRAM 2
Diagram showing the key learning points from the chapter and the next steps to take

2.6

REFLECTION

The ideas gained from this chapter are used throughout the rest of this study and are tested in the concept stage. The values and principles are key parts in critically investigating each design move from these stages. This helps to keep clarity in achieving a design outcome that represents the land first, with the help of the people and culture. By understanding the concepts of *mauri ora* and *kaikatanga*, Landscape Architects can learn from this approach and use this in the future. Because the well-being of the land relates to the well-being of the people, therefore Landscape Architects should work as guardians to protect our land and all the lives within it. For the region of the Wairarapa to work on educating others in these values and beliefs to showcase the landscape they have.

*" At the time of European settlements the
Wairarapa Moana area was a series of connected
wetlands " (Grant)*

Tony Sibery

WAIRARAPA CONTEXT

CHAPTER THREE

Within the case study area, the thesis is based in the Wairarapa region and is working in conjunction with the Greater Wellington Regional Councils team 'The Wairarapa Moana Management Team'. They have focused on the wetland land areas located around the edges of Lake Wairarapa as it is "the largest remaining wetland complex in the southern North Island". Although much of the catchment has been heavily modified, the area still holds significant ecological and culture values. After initial problems and hunches have been clarified, a detail site testing will be conducted within the district for the purpose of the thesis. This team will have introduced the importance of the region and have made themselves available for any resources the project might need.

3.0

WAIRARAPA MOANA WETLANDS PARK

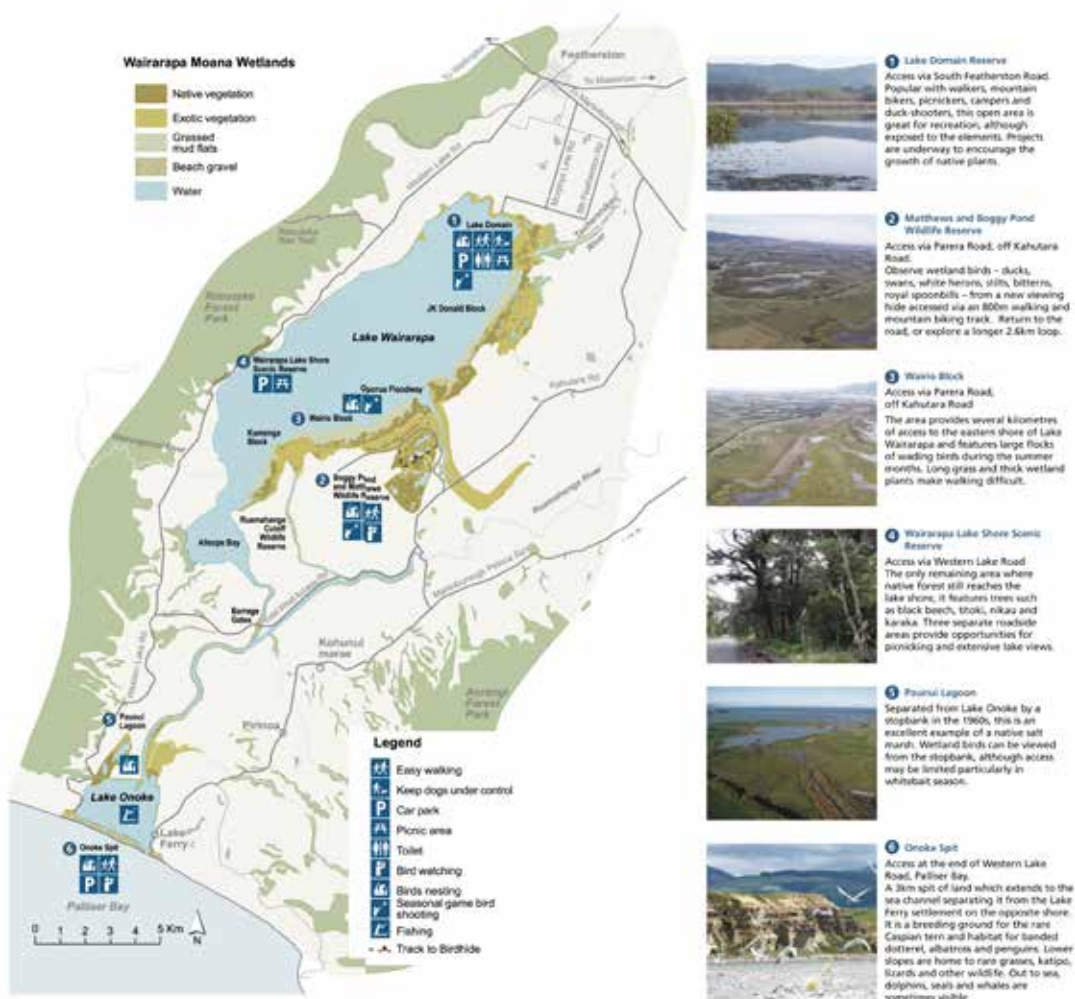


Figure 14. MANAGEMENT TEAM DEVELOPMENT PLANS
The GWRC development plans for Wairarapa Moana Wetlands Park

3.1

RESEARCH STUDY

The Wairarapa region is located an hour's drive out of New Zealand's capital city. Taking a windy journey over the Tararua and *Remutaka* Ranges it opens out to vast expanse of flat land. Within the territory lays five small towns, (Featherston, Greytown, Carterton, Masterton and Martinborough), a variety of agricultural land uses, Lake Wairarapa, historical remnants, endangered fauna and flora species, tourist attractions and culturally significant land stories. The climate of the area is similar to much of the country but is considered in a wider bracket range exceptions to the South Island (Outhwaite). Together this climate is unique with winds from the Cook Strait, strong enough it has shaped much of the land over the years. The region has gone through many changes since the arrival of the European settlers, with stories suggesting much of the land was bush with native totara, kahikatea trees and flax bushes as far as the eye could see. After European settlement in 1800's the land use shifted to pastoral focus (Masterton District Library and Wairarapa Archive). It was also home to soldiers in the military training camp, located in Featherston.

With the increase in population to the area and the growth of the agricultural practices, much of the land has revealed levels of degradation from this. The research study is to test if Landscape Architecture Design can find a solution to these.

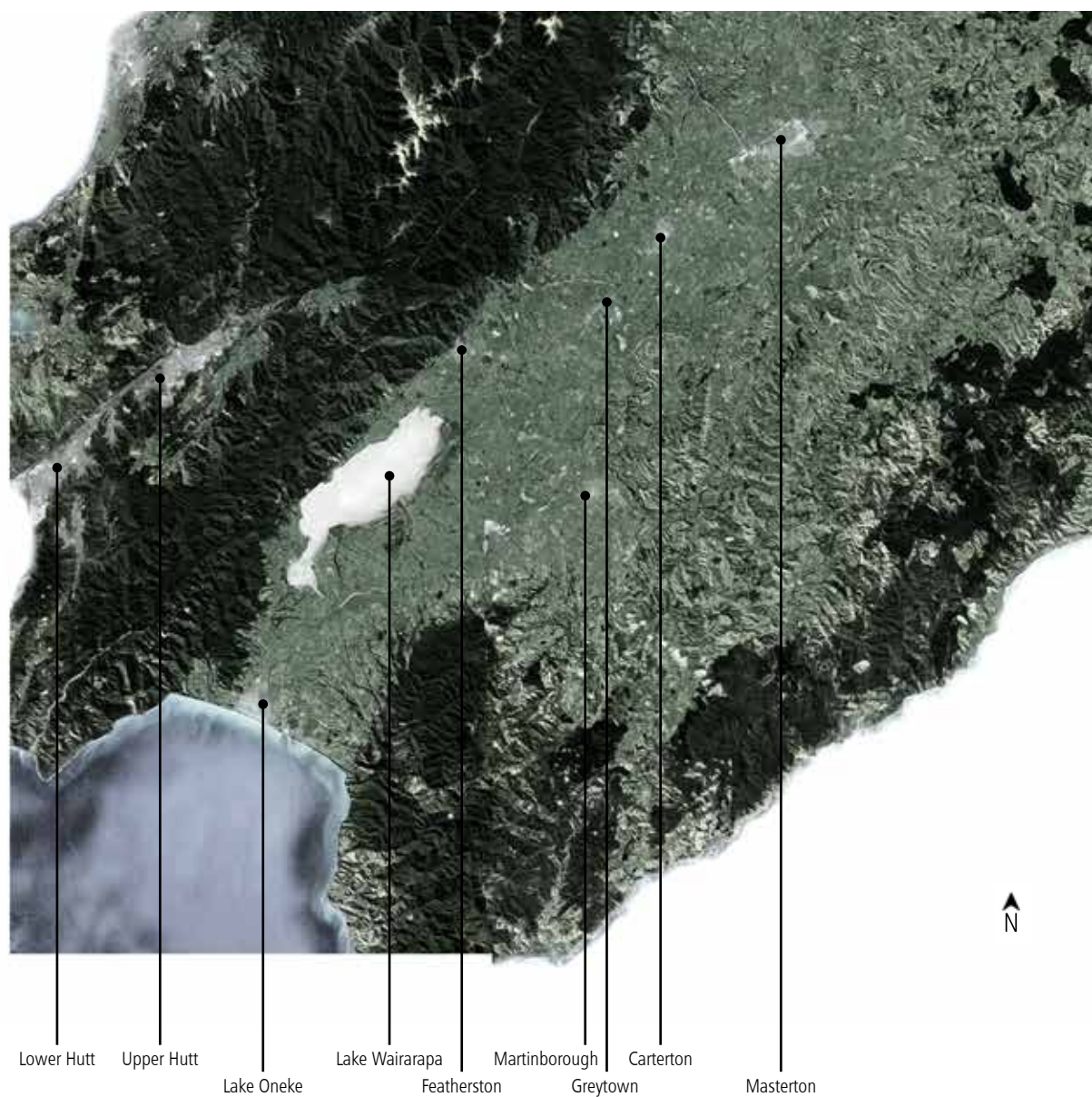


Figure 15. WAIRARAPA REGION
Image shows the research study district



Figure 16. CURRENT INFRASTRUCTURE
Map indicating land parcels and main roads of access

3.2

CURRENT TENDENCIES

The current tendencies that are used for land within the Wairarapa region is mainly agricultural, industrial, commercial and residential. With the highest in agricultural land use. Land use was previously seen as a one use space. Management plans were set and zoned off for specific uses such as industrial, residential or commercial. Now there is a growing trend for these spaces to become mix land uses, an example would be, many apartment blocks will use the ground floor as commercial space. This trend has occurred as the space we once had is rapidly decreasing through the need to accommodate for the population growth struggles.

Throughout the rest of New Zealand, another large area of land use that is noticeable in journeys across the country is the pine industry. New Zealand exports wood chips, whole logs, lumber and paper products through the growth of *pinus radiata*, Monterey Pine. This industry occupies a large area of land for the one use that it produces. As the pine trees are tall they over shadow much of the earth below, therefore little will grow underneath the tree canopy. Similar one use land situations can be seen for vineyards, corn farming, lettuce farming and tequila farming. These case studies all relate to one another through the use of productive landscape and the use of planting. The problem with this is there is not enough land to accommodate for one use land systems.

What if there was another way for a productive landscape to assist in including a multi-use land management plan, while benefiting the land and people surrounding it. What would this look like? What would be its uses? Can the Māori culture influence these spaces through the use of the Te Aranga principles?

3.3

SITE LOCATIONS

Upon visiting the Wairarapa region many narratives and tales were told about the land, people, the war, shootings, swimming in the lake, the vegetation covering the edges of the lake, crown court cases, and farming. These narratives only added to the original analysis made back then. The way in which narratives are told, many people start to paint a mental picture in their minds of what is being told to them. This quality was something that the researcher had tested before in a design project. Upon rehearing the narratives for this study, a list of key sites was mapped from these. Pigeon bush, old war training camp, the Lake domain reserve, Boggy pond and Matthews lagoon, Lake Oneke, and the spit. These chosen sites were purely based off the notion that a mental image was formed in the mind, therefore a connection to see if this picture matches the site. They also all held important qualities related to the study. Either they were cultural important, historical lost, or self-damaged by humans.

Out of this list three stood out for different reasons. The three sites make up a range of physical features for the thesis research to be tested on forest, wetland and coastal typologies. It is important for the study to test in detail one site and then apply the reasoning to the others, in order to prove that Landscape Architecture and the Māori design principles is the best solution for unconventional issues.

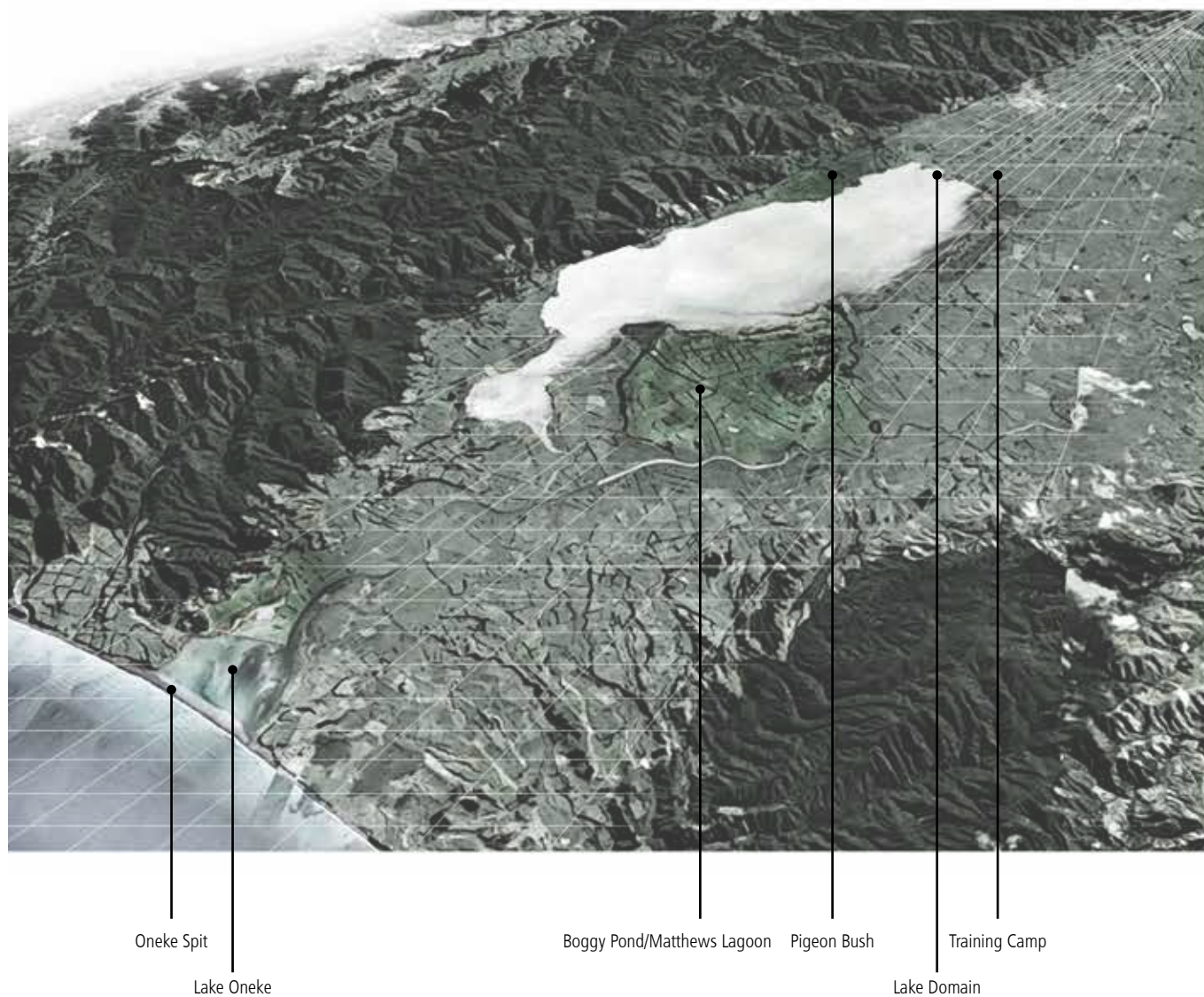


Figure 17. SITE LOCATIONS
Map referencing location of the sites

3.4

SITE IDENTITIES



Figure 18. PIGEON BUSH MAP VIEW
Image showing the bird eye aerial of the site area. Farmland and reserve land

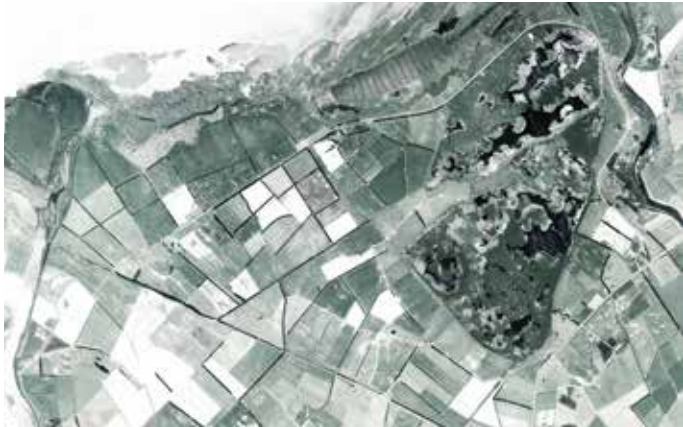


Figure 19. BOOGY POND/MATTHEWS LAGOON MAP VIEW
Image showing the bird eye aerial of the site area. Wetland system



Figure 20. ONEKE SPIT MAP VIEW
Image showing the bird eye aerial of the site area. Water mouth to sea

N

Spot One - Pigeon Bush

Located 6km south west of the town Featherston, Pigeon bush is currently privately (farm) and publically (reserve) owned land. Along the road there are still visible signs of where the old railway station platform used to be, with road deviation and chimneys in the field from the old building. Another reason why Pigeon bush is well-known is this is where the Māori people invited the Europeans of the area for a picnic. This picnic was years after long court battles for the ownerships of the lake and adjacent land between the two cultures. This event was for the gifting of the lake from the Māori people to end all arguments and has been in the crown's ownership ever since.

Spot Two - Boggy Pond/Matthews Lagoon

This public reserve is located on the eastern edges of Lake Wairarapa. It is one of the last remnants of the old wetland system that was lost after severe draining occurred from farmers wanting more land for grazing. The wetland is made up of two water bodies with a stop bank access way running through the middle of the two. Surrounding landscapes include privately owned agricultural land and over Parera Road north of the system is another DOC restoration project of a wetland system.

Spot Three - Oneke Spit

This lake is located at the southern edge of the Lake Wairarapa, and is commonly known to Europeans as Lake Ferry from the small settlement to the east of the water edges. The lake is famous for the 4km gravel spit formed between it and the ocean. It is a migratory route for white bait and tuna, and in the past was well disputed over between Māori and Europeans. As the areas above are prone to flooding, the Europeans wanted to close the spit, on the other hand this was an important natural process for the livelihood of the Māori people in the area.

3.5

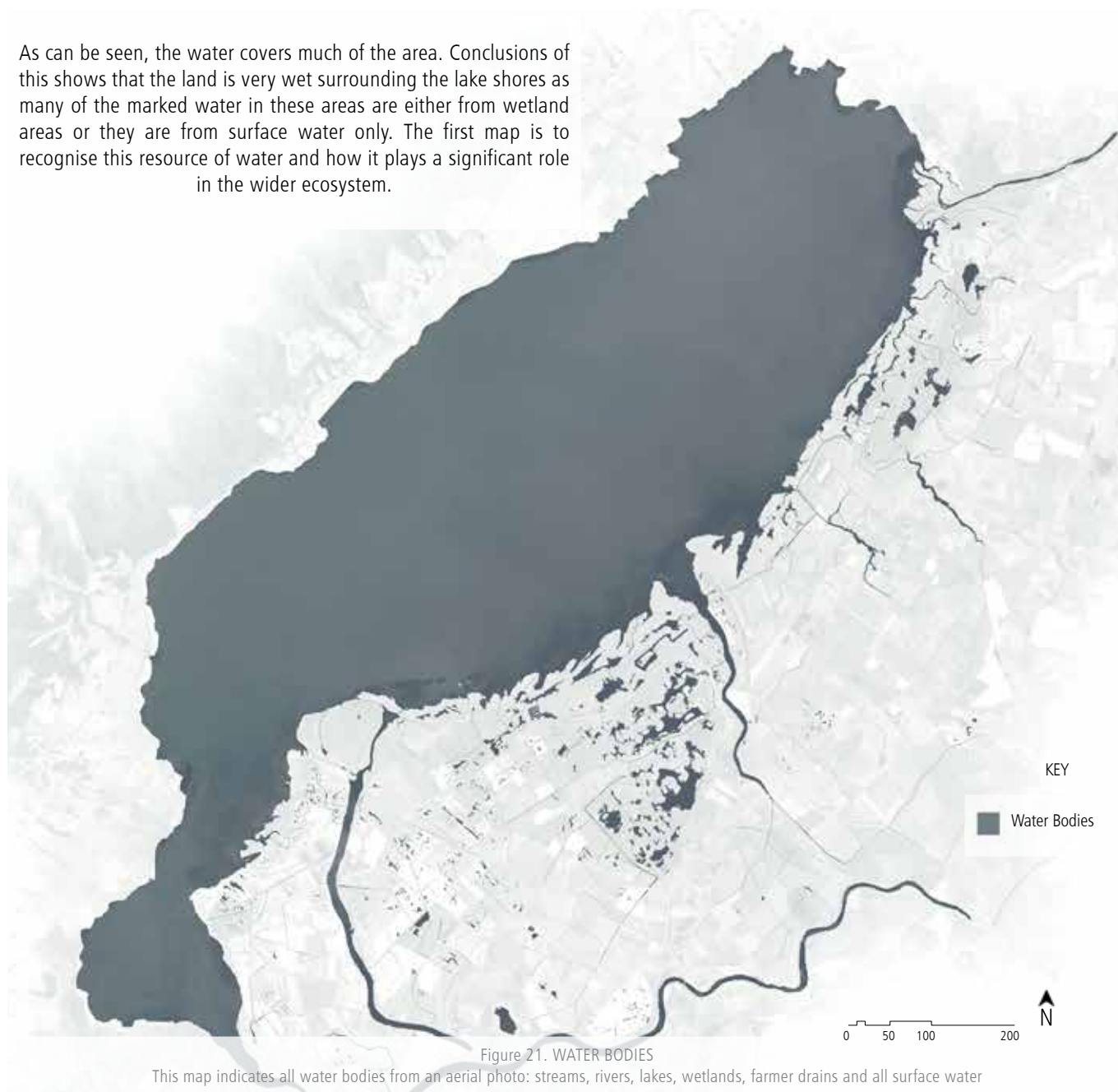
ANALYSIS

As part of the research approach, this project is undertaking macro and micro scale analysis to efficiently understand the problems in the Wairarapa. These types of scales are based from the research structure in following a linear path. To logically understand what main issues are happening at a regional scale, then to zoom into detail to find the specific problems and where these have originated. This helps to connect problems across the plain to understand ways in finding solutions that correlate to the wider context. The following set of GIS analysis maps are at a macro scale of the lake and its immediate surroundings to see the connection between these elements. This is also because of the main problems already discussed in the project of people shaping the land, fight for land space, and water quality. The micro scale will be used in more detailed work when understanding the sites chosen and then again in the development of the design process, throughout the testing phases. This will again aid in finding and testing appropriate design solutions for these problems and the region.

3.6

WATER BODIES

As can be seen, the water covers much of the area. Conclusions of this shows that the land is very wet surrounding the lake shores as many of the marked water in these areas are either from wetland areas or they are from surface water only. The first map is to recognise this resource of water and how it plays a significant role in the wider ecosystem.



PAST VS PRESENT WETLANDS

The large amount of water that covered the Wairarapa was somewhat a surprise, as all the stories told was about the loss of water through farmers draining water for more agricultural land. This suggested what used to be here. This map and infographic gives an idea to how much water was lost over time. Only 10% of remaining wetlands are left.



Figure 22.1 PERCENTAGE DIAGRAM
Percentage of wetlands remaining within New Zealand

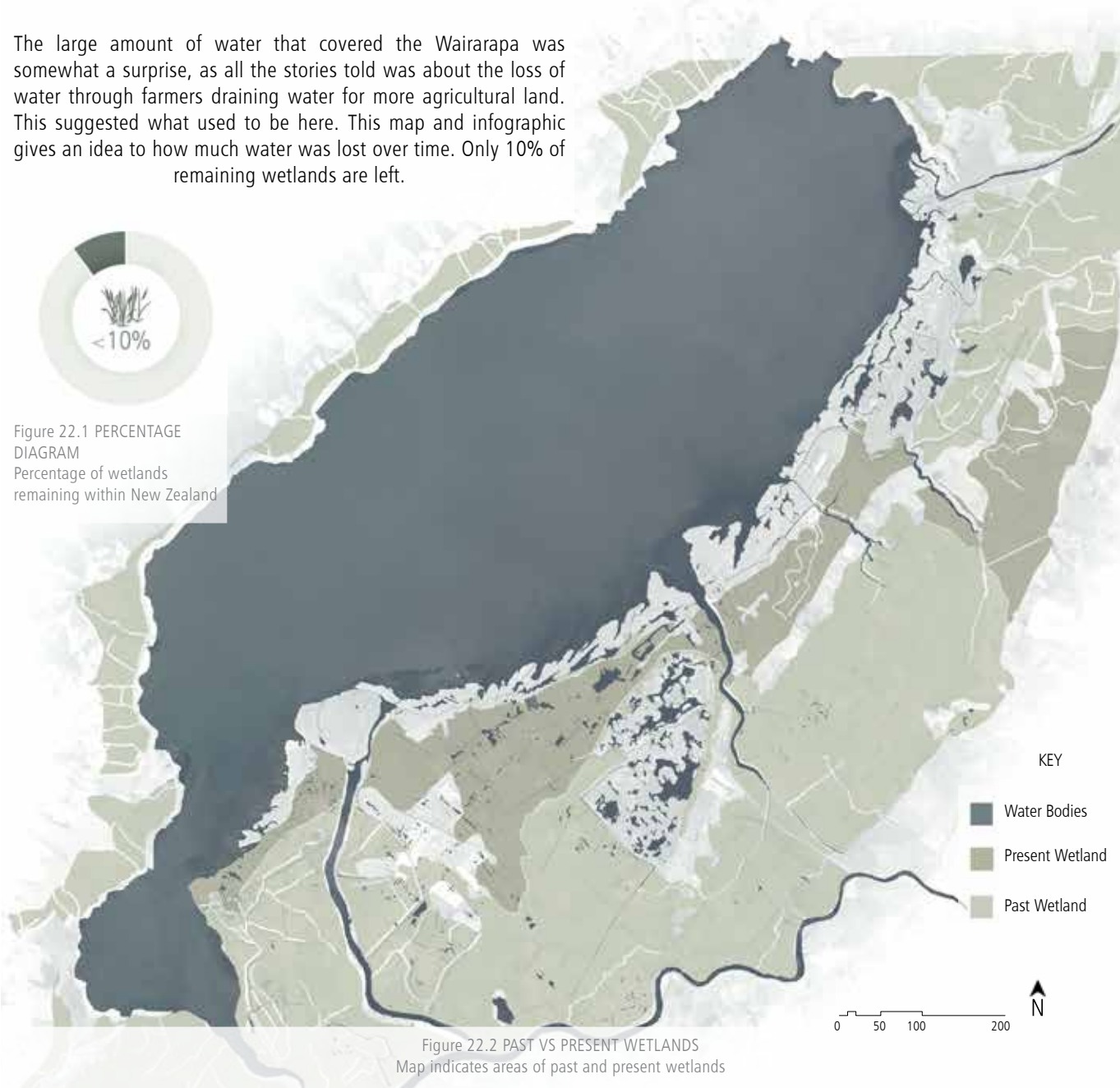


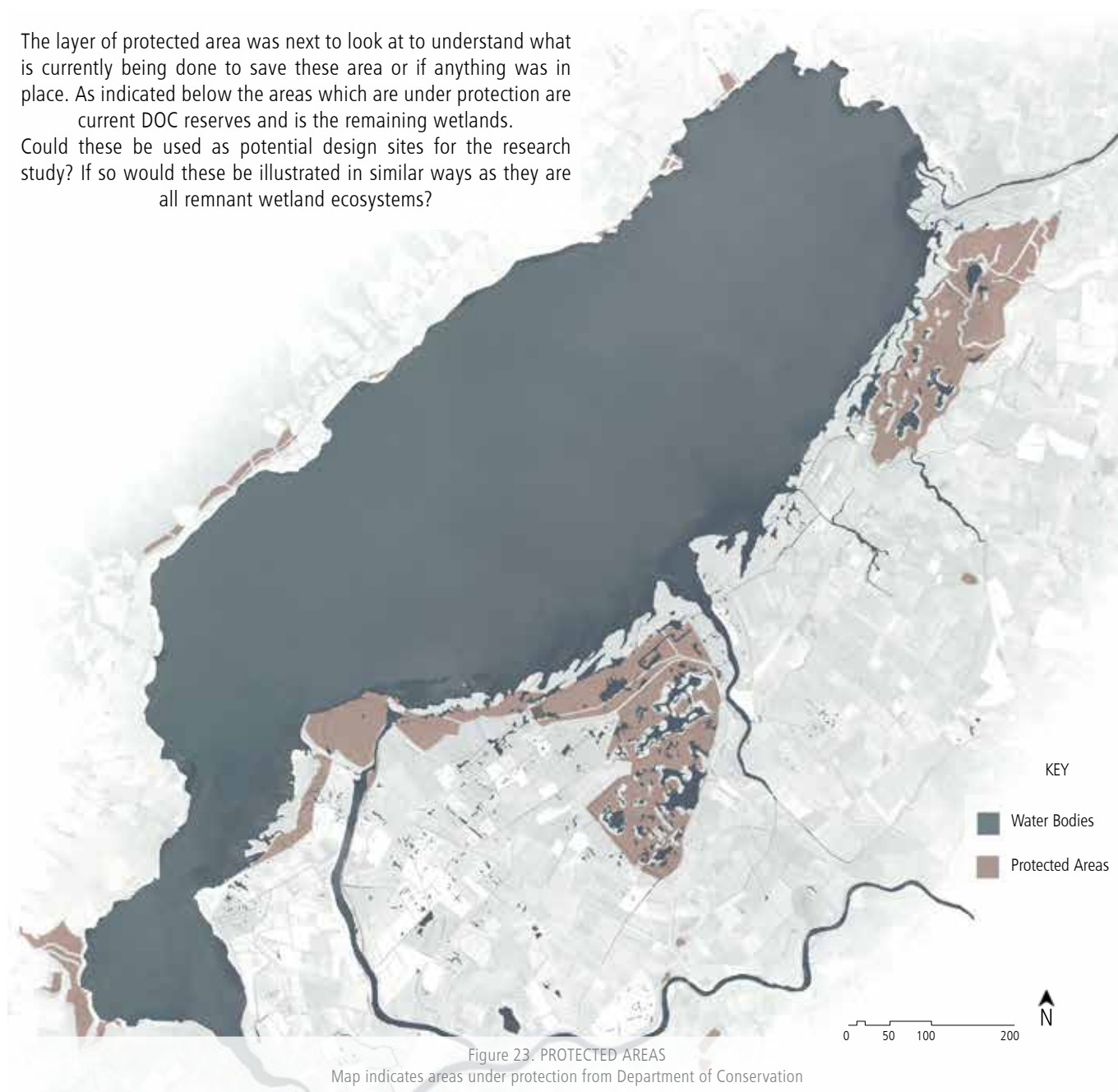
Figure 22.2 PAST VS PRESENT WETLANDS
Map indicates areas of past and present wetlands

3.8

PROTECTED AREAS

The layer of protected area was next to look at to understand what is currently being done to save these area or if anything was in place. As indicated below the areas which are under protection are current DOC reserves and is the remaining wetlands.

Could these be used as potential design sites for the research study? If so would these be illustrated in similar ways as they are all remnant wetland ecosystems?



3.9

VEGETATION

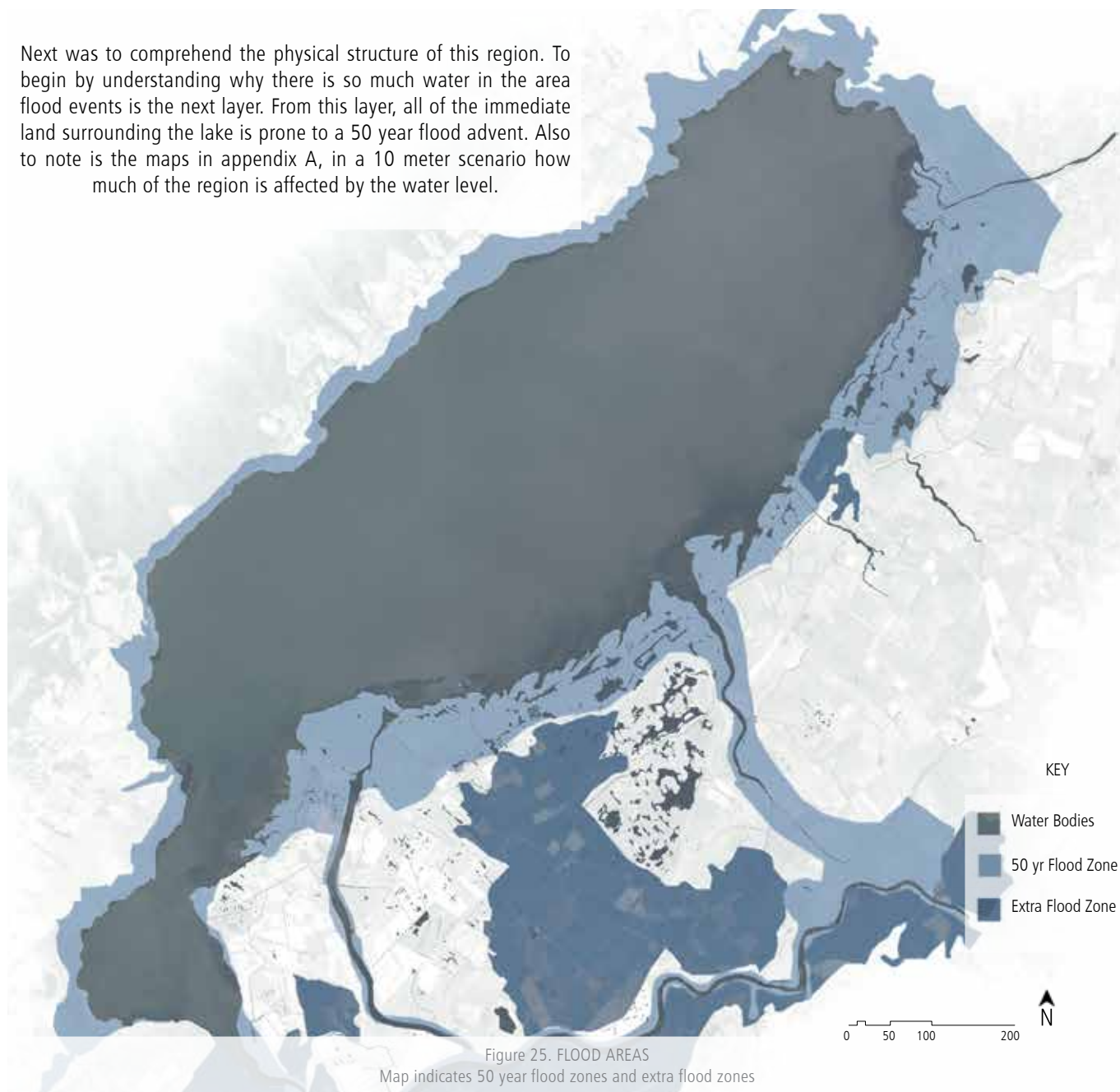
If there was design potential areas, the next step is to understand what there is to work with within these spaces. This layer shows a significant area of exotic fauna with little to no left of native vegetation anywhere, less so surrounding the lake. This layer matches to narratives spoken about with the loss of trees from grazing fields and from the significant loss of the wetlands.



3.10

FLOOD AREAS

Next was to comprehend the physical structure of this region. To begin by understanding why there is so much water in the area flood events is the next layer. From this layer, all of the immediate land surrounding the lake is prone to a 50 year flood advent. Also to note is the maps in appendix A, in a 10 meter scenario how much of the region is affected by the water level.



SOIL DRAINAGE

With the lack of native vegetation to control water run-off, and the fact that the area is prone to flooding the question was, where was all this water going? Soil drainage was then essential to look at, from this layer it shows that the land is imperfect for soil drainage, which explains all the surface water. This imperfect soil drainage makes farming practices unproductive and unhealthy with pugging in beef and dairy fields.



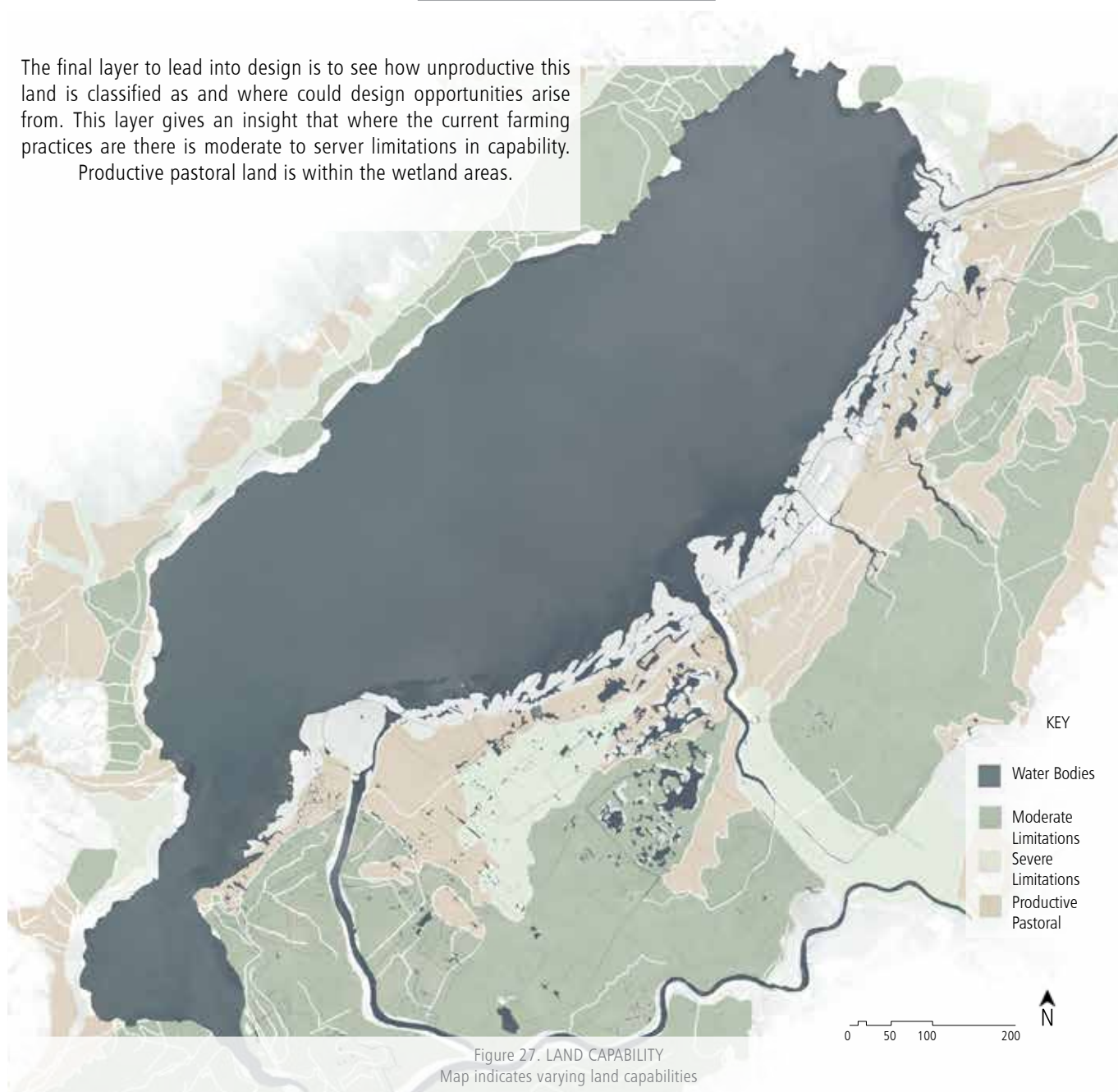
Figure 26. SOIL DRAINAGE
Map indicates soil drainage types

3.12

LAND CAPABILITY

The final layer to lead into design is to see how unproductive this land is classified as and where could design opportunities arise from. This layer gives an insight that where the current farming practices are there is moderate to severe limitations in capability.

Productive pastoral land is within the wetland areas.



3.13

ACCESS

From a previous study in Featherston, a little knowledge was known about the access across the region. On maps it is easy to loose judgement on how big the lake is, to travelling from one end to the other. From the town Featherston, its takes 34 minutes by car to reach Lake Oneke, via Kahutara road (43km). Roads included in the lower Wairarapa region consist of state highways, main roads, farm road, and paper roads (light to little traffic) most of these travel to one destination. Not many people travel through the lower region because of this access. The challenge for the design will be how to encourage people to use these routes to reach the design.

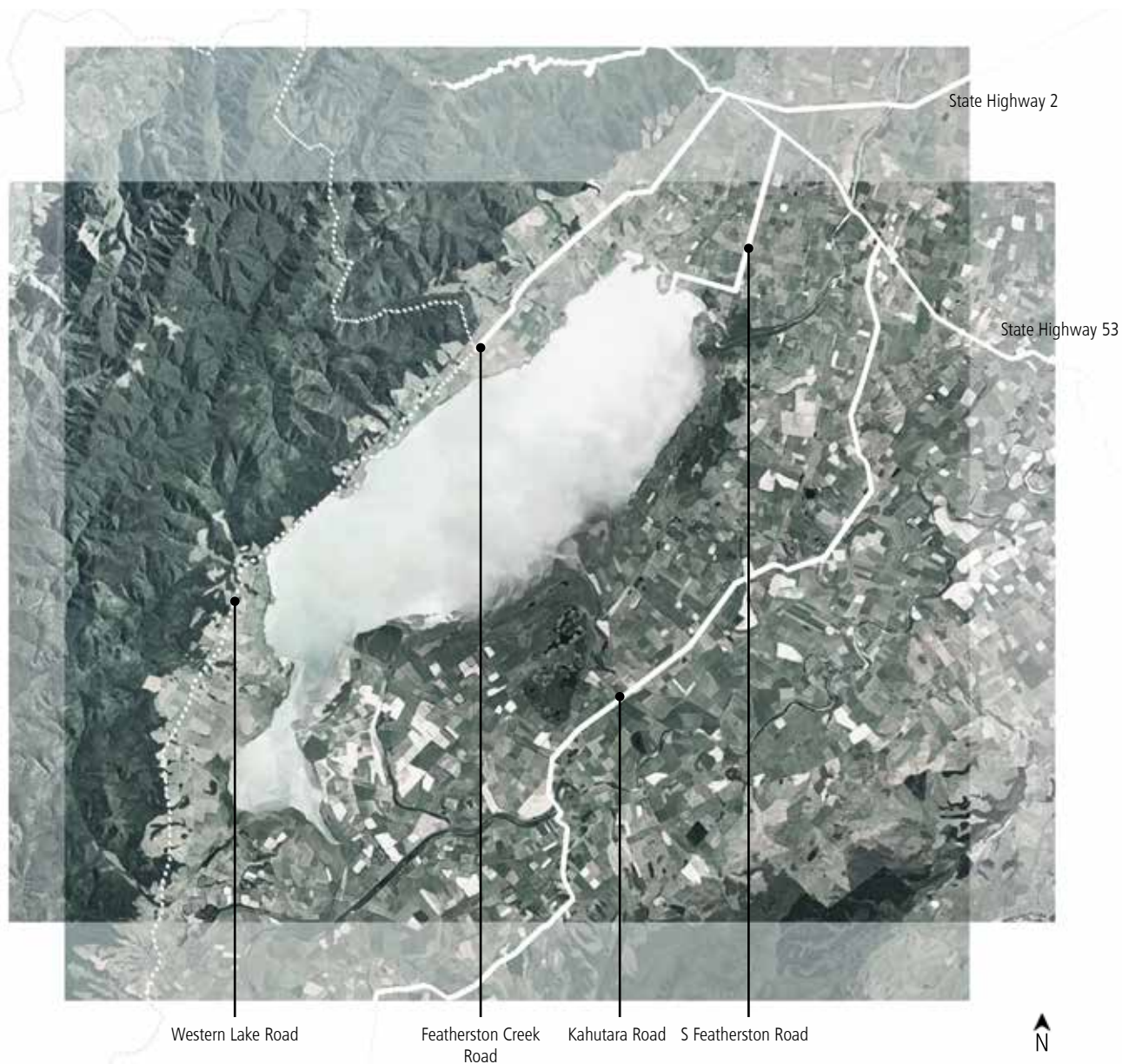


Figure 28. ACCESS
Map indicates main routes

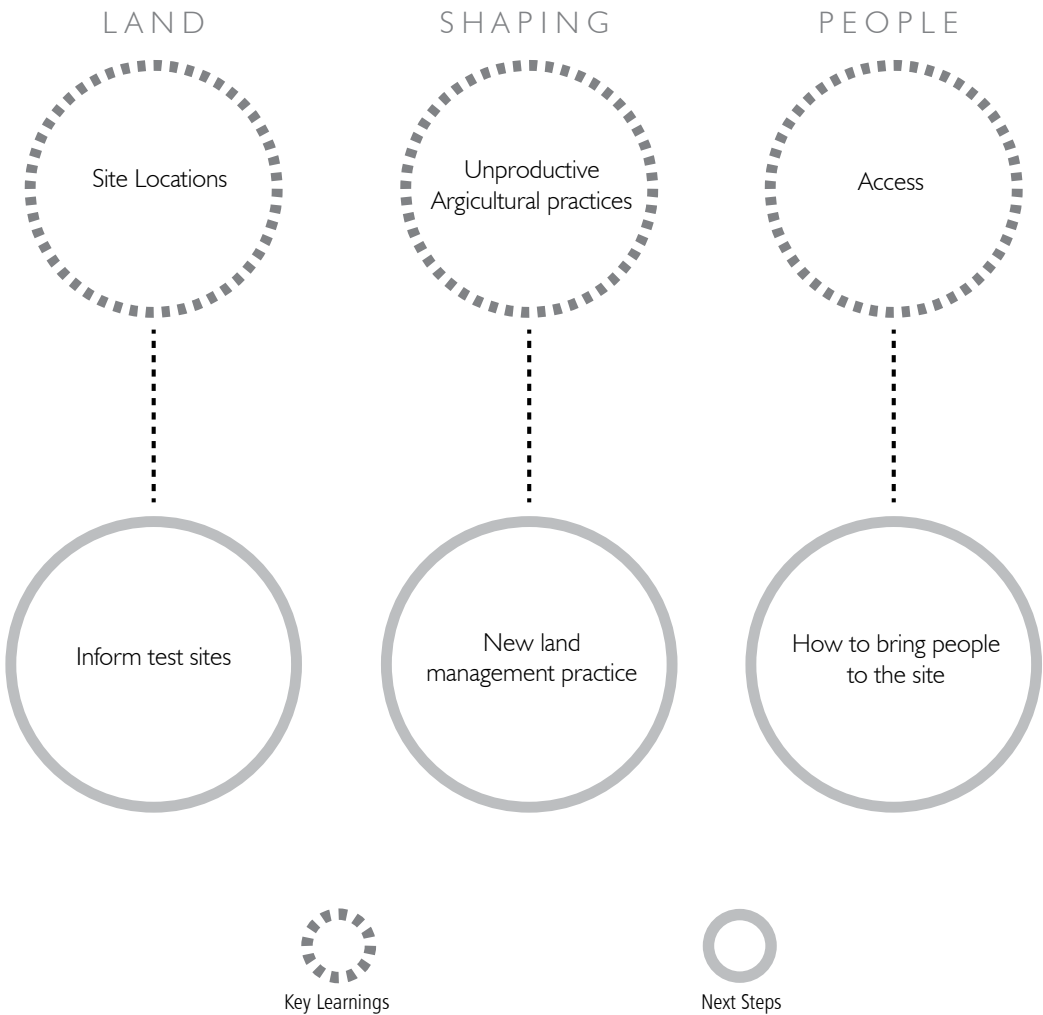


Figure 29. CONCLUSION DIAGRAM 3
Diagram showing the key learning points from the chapter and the next steps to take

3.14

REFLECTION

The Wairarapa region opens up plenty of site opportunities for beneficial design ideas. This is because the region is full of rich ecosystems and significant cultural and historical areas. However, there are some issues of water quality, and lack of diverse biodiversity surrounding these systems. Upon narrowing down three design sites, it has given the research a chance to tackle the three independently because of their distinctive characteristics but using a holistic design principle as a guiding net. This will assist to prove that these principles and design ideas are the way forward for the future in listening to the land and living sustainably through this process.

Next step is to examine in detail different design options that have happened in similar situations. Critically analysis the case studies involving agricultural practices and natural systems and apply these into the site, along with the study on design principles to guide what the design solutions will be.

THEORY

CHAPTER
FOUR

4.0

LITERATURE REVIEW

This research study is producing a new framework for kiwi farmers and land users to live with the land. It looks to do this through the use of the fundamental values held within the indigenous culture of New Zealand to advocate the idea of the 'land shaping' the 'people' as an alternative to the 'people shaping' the 'land'. This literature review aims to explore and discuss the following four topics: regeneration over restoration, sustainable management in farming, fibre production, and how to use landscape as an instrument.

REGENERATION OVER RESTORATION

'Restoration' is defined as "the act of returning something to a former owner place or condition" two important words in this definition are 'returning' and 'former'. This implying of returning and former into a landscape scenario gives the idea that the land will look and function in the same way it formerly was. Similar to if someone was to 'restore' a historic building back to its former glory. However a landscape is a living and evolving ecosystem which could not be returned 100% to its former glory. Not when so much around it has changed. Which is where the meaning of regeneration comes into play. 'Regeneration' is defined as "spiritual renewal or revival". In this phrase 'revival' is the important word to focus on as it explains what a landscape involves. The idea to regenerate something means it needs to purpose an outcome. So when a landscape is unproductive and has been for a while, it needs reviving back into working order. This is done by regenerating old ideas of the landscape when it was in a productive state and implementing these ideas into the current situation of the landscape. Generating a new layer to this narrative of the space and a spiritual renewal of old ideas in a new world.

The idea of regeneration over restoration is a personal notion that plays a large role in the modelling of the design decisions throughout this research study. Branching off the Maori cultural values that are held towards the land, specific design principles were drafted. These were formed as a practical direction to follow when designing with the landscape. This practical approach relates to how the researcher views the word regeneration over restoration and together ties in to the design principles chosen for this study. To understand the choice of why to have the concept of regeneration over restoration as the way forward for future designs, we must first practically understand the meanings of each word.

The word restoration is used throughout the landscape profession more than it probably should be. It gives the users and designers an idea of bringing something back. However, from the definitions discussed before, this is not the correct terminology that should be used. This term also hinders the designer's solutions to a design, as the focus is on doing what was already done. By regenerating a piece of land, it is to use the ideals of what it was when it was in working order as a tool and apply them to the site in such a way it provides new outcomes. As the landscape and requirements have changed since it was last in working order.

Therefore, so does the solutions to the problem.

FARMING: SUSTAINABLE MANAGEMENT

As time continues to move on, the population grows, the needs for this population is greater, climate change becomes more of a relative issue, land space decreases, and natural resources become harder to get a hold of, the time for change is ever encroaching, as is the ideas of a sustainable earth. Many of the topics mentioned before have been putting pressure on the farming industry not only in New Zealand, but all over the world. Two of the issues above all are nevertheless, the most significant in relation to this landscape research study area. These are the limited availability of our natural resources and the decreasing land loss the world is facing. But how is landscape architecture and sustainable farming related? Is it possible for a landscape architect to help improve sustainable farming practice?

Agriculture around New Zealand has become highly focused on its dairying production, as it has become one of the most successful imports for the country's economic benefit. Statics New Zealand shows in just one year a 3% increase of dairy farming from 2013-2014, which translates to 6.7 million cows (Zealand). For this increase however, more land is needed for the extra grazing space. Which is where the topics above play hand in hand. More land means more resources for the country, but when this land is in competition for the growing population as well as farming, it becomes a problem. This fight for land space causes farmers to intensely farm their animals on the land they currently have, drain water bodies for more land space, and farm on unproductive lands. The cow to land ratio then causes health difficulties for the land they are on. It can causes major waste run off which enters into surrounding streams, declines soil quality with the amount of compacting, puts pressure on the animals and affects the surrounding communities natural resources. "When farm size increases, production per hectare actually falls" (Guttmann-Bond). Many documents from local councils, farming organizations and iwis members have been drafted to prevent the above outcomes of farming intensively. In spite of this, we are still dealing with the same issues. But what if a design approach was taken to solve these problems?

Which is where Landscape Architects could help to combat the issues that farmers are facing. Landscape architects are taught to look at all the angles, values, possible outcomes and all while working within the space provided to find a solution to the problem set to them. One concept that has been trending throughout the recent years is multifunctionality within a singular space. This application has been proposed to be used in the farming industry, and has “origins from Rio Earth Summit 1992 and implies that agriculture provides more than production of food and fibre, such as the preservation of biodiversity and contributing to the socio-economic viability of many rural areas” (Haaland). In using the techniques of a landscape architects, the idea to use a design approach for multi-use within agriculture could be applied into the situation in the Wairarapa.

AGROFORESTRY: FIBRE PRODUCTION

New Zealand's total "land area of 26 million ha, 5 million ha is in native forest, most of which is protected as National Parks or Reserves, agriculture uses 18 million ha and exotic forestry 1.2 million ha" (Hawke). As mentioned previously, with the growing population more and more resources are needed to cater for the growing numbers. Along with these growing numbers is the fight for land space for people and the production of resources. The current fibre market is repurposed from pine tree, *pinus radiata*, farming, which has been working to meet the needs of humans for decades. But with the limited amount of space the earth is currently faced with, the pine industry takes up a lot of land coverage for only a single use resource and can only grow in limited areas. The problem that the earth is faced with now is, how can the fibre industry still produce the amount of fibres needed and provide a multi-land use production?

Agroforestry, is a concept that has been used within the pine industry but too little success in the idea of intentional farming. AFTA defines agroforestry as "an intensive land management system that optimizes the benefits from the biological interactions created when trees and/or shrubs are deliberately combined with crops and/or livestock" (What is Agroforestry). Although, the problem is after the pine trees reach a particular age, the ground cover is enclosed in shadow from the trees canopies. This leaves little to proposer underneath. "The decline in pasture production with increasing stock and/or age of trees is primary result of the direct competition effects for light, soil nutrients and water". This concept can then only be in action for the younger years of the pine tree before it is harvested.

The answer to what else could be used for fibre is found through history and in old Māori culture practices. In the past, New Zealand's indigenous culture lived for many years without the need of large machines to cut down pine. All of their fibre was harvested from lower level plants with tools found in the earth. The several plants ranged from different species and each used for various needs. The one that was frequently used however, was a plant called harakeke *Phormium tenax*. Not only was it harvested for its fibres but it was also used for its medical qualities for hundreds of years. "All parts of the plant have been valued and utilised: root extracts, leaf extracts, gel, nectar, korari, leaves and muka" (McGruddy) which meant there was essentially no waste to this plant. With the substitute of harakeke the next step is to see if the notion of intentional farming can occur among this plantation design. Can cows or sheep graze freely through these land blocks and co-exist with the plants?

LANDSCAPE AS A TOOL

The job of a Landscape Architect is to typically solve problems transpiring within the landscape be it residential, public, commercial or regional. This is achieved through analysis, research, public study and concept design and development. However, Landscape Architecture is not so commonly related to resolving problems with agricultural practices. There is a clear design in how agricultural land works and management plan for stock rotations and field cropping. In spite of this, these 'designs' are made from a one point perspective, the farmers, where their main goal is the health and productivity of their animals or crops. But what about that of the environment, biodiversity values and sustainability? What if a Landscape Architect re-designed this land to promote these ideals that all landscapes should hold?

Landscape Architects have knowledge of "art, civil engineering, ecology, geography, sociology, psychology, horticulture and business" (Booth) which makes them unbiased to one element within the landscape as they must design for a range of constraints. This research will use these theories and principles from the research to prove that in fact Landscape Architecture can be used as a tool to implement agricultural land solutions (see figure30), in the aid to promote healthy and sustainable land practices throughout New Zealand. As the impartial designers they can find a solution to benefit all issues of the site, expanding the opportunities for Landscape Architects and the profession.

In solving the issues of the site, landscape design can respond to other land based problems uncommonly addressed by Landscape Architects, with the end goal to promote the notion of the land as a living being, something that all humanity needs to start realising as it is degrading before our fingertips.

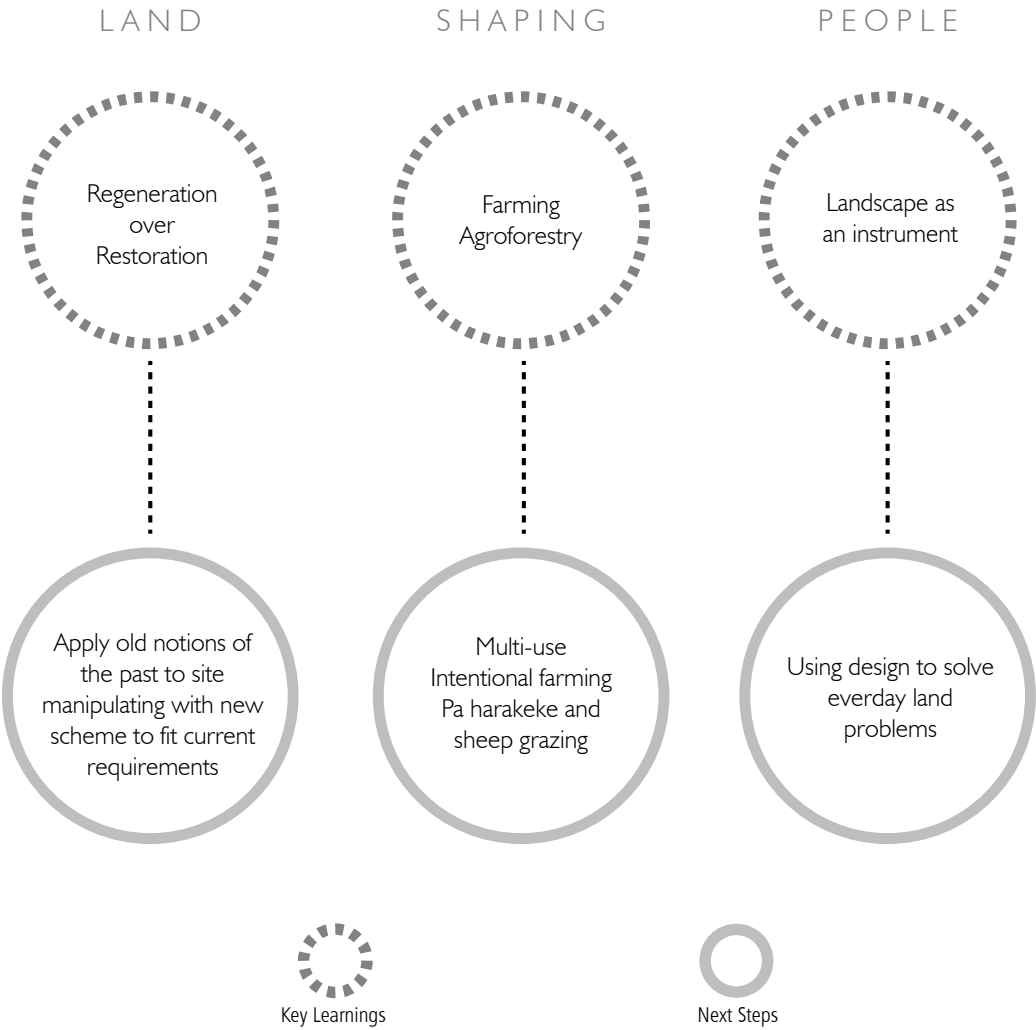


Figure 30. CONCLUSION DIAGRAM 4
Diagram showing the key learning points from the chapter and the next steps to take

SITE SPECIFICS

CHAPTER FIVE

From starting with different forms of analysis and focusing on three sites, it is now at the point where the study needs to be detailed and tested. Which is why it is important to feature one site as the testing subject for a focused design. Boggy pond and Matthews lagoon shows the most challenging elements of including public and private land. The following chapter clarifies the different elements involved in this agricultural practice and remnant wetland system. It explores the functions of the wetland and how the surrounding landscape affects this. Finally, examines the particular problems of this site, what it means for the people, the ecosystem, and the regional scale implications.

5.0

RESEARCH FOCUS AREA



Figure 31. RESEARCH FOCUS AREA
Aerial map indicates boundaries of site. From the Ruamahanga cut off to Kahutara river

5.1

CURRENT LAND USE



Figure 32. CURRENT LAND USE
Map generated with GIS information, showing all land use types

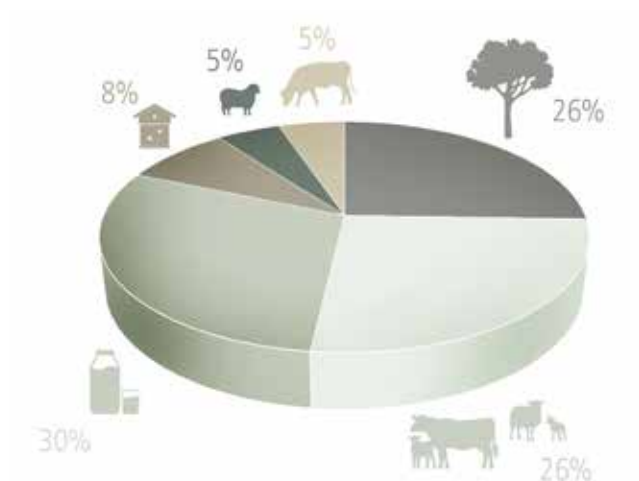


Figure 33. PERCENTAGES OF LAND USE
Pie chart to show the values of the land use across the study site

As previously stated there is public and private land blocks in this site (map on page 72 indicates these boundaries). The public land is the wetland area, which is under DOC reserves. It has a small access path running along the stop bank which separates the two water bodies, as seen in figure 34. The private areas are all agricultural land blocks. These have a mixture of sheep, beef, and dairy. Because of the large number of dairy farming, the run off from this is entering directly into the waterways as there is not appropriate vegetation buffers as seen in figure 35.



Figure 34. STOPBANK
Current image of the stop bank path through Boggy Pond



Figure 35. FARMERS DRAIN
Image showing the lack of a vegetation buffer around waterways

5.2

SITE SIGNIFICANCE

The table on page 75 is taken from a draft report on the extent and significance of Wairarapa Moana wetlands and Lake Pounui. It contains an overview of a number of wetland sites located in the Wairarapa Moana. Boffa Miskel assessed the sites for their indigenous biodiversity values and ranked them within this table (Reeves).

Singled out in this image is the assessment from Boggy Pond and Matthews Lagoon, showing a high ranking of its significance and biodiversity values. The initial research from the wetland site has justified the reasoning of singular this site to detail. As it holds great importance to the area but is currently threatened by surrounding land uses. In designing a solution for these problems it could help to bring awareness to the other significant wetland sites in the region. Help to strengthen the ecological biodiversity that was lost within this district.



Figure 36. WAIRIO WETLANDS
Image showing current restoration project of a wetland located north of Boggy Pond

Draft

Site No.	Site Name	Significance Criteria									Biodiversity Values	Significance Justification
		Representative	Threatened Environment Classification	Ecosystems or Habitats	Indigenous Flora and Fauna	Ecosystem diversity	Species diversity	Connectivity	Buffering	Seasonal or core habitat		
8	Makokahi backwater	C	A	D	B	D	C	D	H	H	Significant	diversity of plant and bird species and is likely to contain more fish species that occur within Lake Wairarapa. The JM Donald/Tamsa wetland complex is part of the extensive network of wetlands associated with Lake Wairarapa and provides a buffer to the Eastern Lake Wairarapa wetlands.
9	Oporua Spillway Backwater	D	A	D	C	C	C	D	B	C	Significant	The Makokahi backwater is a small lagoon with significant indigenous biodiversity values. It is typical and characteristic of the Wairarapa Plains Ecological District and occurs in an area with <10% of indigenous vegetation remaining. It contains one 'threatened' bird species and one 'at risk' fish species. It provides core habitat for one 'threatened' species.
10	Boggy Pond/Matthews Lagoon	B	A	A	A	A	A	A	B	A	Significant	The Oporua Spillway Backwater is a cluster of three small paludine wetlands. It is considered to have significant indigenous biodiversity values being a wetland in an area where <10% of indigenous vegetation remains.
11	Wairarapunga wetland	D	A	A	B	B	D	D	A	H	Significant	Boggy Pond/Matthews Lagoon is a very large wetland complex wetland with significant indigenous biodiversity values. It contains some of the best remaining examples of freshwater lagoons and ephemeral wetlands in the Wairarapa Plains Ecological District. It occurs in an area where <10% of indigenous vegetation remains. Ephemeral wetlands are a nationally rare ecosystem type. Boggy Pond/Matthews Lagoon contain six 'threatened' and seven 'at risk' bird and plant species providing core habitat for many of these species. A high natural diversity of habitat types are present including open water, emergent macrophytes, sedgeland, flaxland, mānuka shrubland, herbfields, and wetland forest dominated by crack willow and alder with pockets of kahikatea forest. A high natural diversity of plant and bird species occur here. Boggy Pond/Matthews Lagoon is part of the extensive network of wetlands associated with Lake Wairarapa.
12	Western Akopu Bay	C	A	A	B	B	B	D	A	H	Significant	Wairarapunga Wetland is a collection of wetlands near the mouth of the Wairarapunga River that occur along the margins of Lake Wairarapa. They contain significant indigenous biodiversity values and occur in an area with <10% of indigenous vegetation remaining. Lake margin wetlands are a nationally rare ecosystem type. The wetlands provide a buffer to Lake Wairarapa and are likely to provide core habitat for some protected species.
		C	A	A	B	B	B	D	A	H	Significant	Western Akopu Bay is a very large area of lake marginal wetland and 'paludine swamp' with significant indigenous biodiversity values. The wetlands are typical and characteristic of the Wairarapa Plains Ecological District and occur in an area with <10% of indigenous vegetation remaining. Lake margin wetlands are a nationally rare ecosystem type. It contains one 'threatened' and three 'at risk' plant species and is likely to provide habitat for two 'threatened' and three 'at risk' animal species, providing core habitat for many of these species. A natural diversity of habitat types are present including open water, emergent macrophytes, sedgeland, flaxland, shrubland, herbfields,

Figure 37. TABLE OF SIGNIFICANCE
Table taken from Wildlands significance report, stating the values held for Boggy Pond/Matthews Lagoon

5.3

BOGGY POND / MATTHEWS LAGOON

Located on the eastern edge of Lake Wairarapa, Boggy Pond and Matthews Lagoon is part of the 10% of the remaining wetlands in New Zealand, (page 46). They formed from the changes of river courses after flood events and the deposition of sand dunes. However, the wetland was physically highly affected by the draining of surrounding water bodies in 1980s. Matthews Lagoon is now pumped water from an agricultural output from the Te Hopai Pump station. Boggy Pond on the other hand, only receives rain water and ground surface water.

Both wetlands are subject to farm run-off from the extensive dairy farming and lack of vegetation buffers along the water ways to protect them (seen in figure 38). Because of this change in the makeup of the wetlands they are now very polluted and unhealthy with exotic flora growing, many native species that used to live here are not found within the ecosystem anymore, and decreasing biodiversity value.



Figure 38. STOPBANK DIVIDING PRIVATE AND PUBLIC LAND
Image of failing stop bank dividing public land (on the left side) and private land (on the right side)

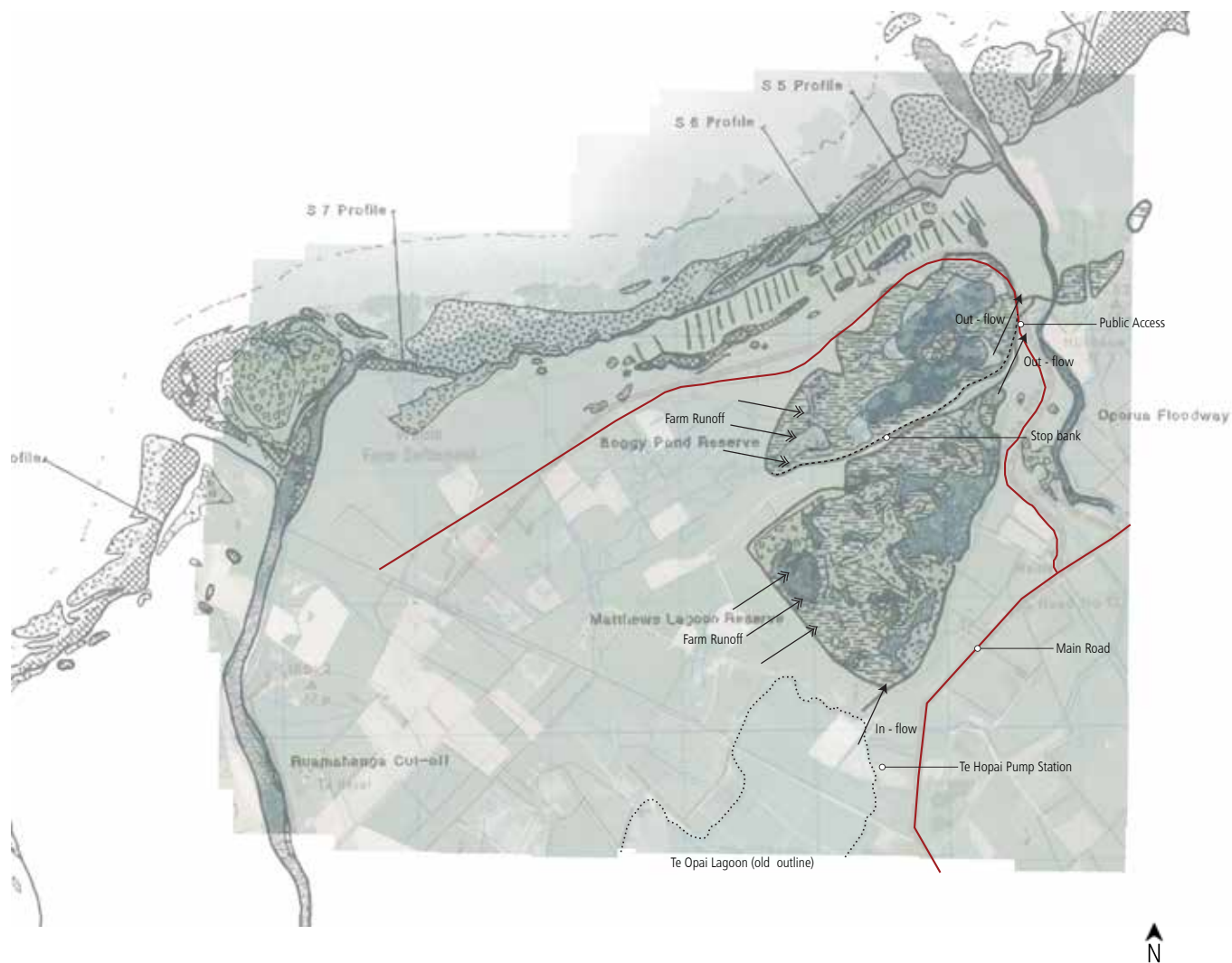


Figure 39. HYDROLOGY OF THE WETLAND
Diagram describing the water movements and types through Boggy pond/Matthews Lagoon

5.4

CURRENT RECREATION



Figure 40.
BIRD WATCHING



Figure 41.
KAYAKING



Figure 42.
WALKING



Figure 43.
BIKING



Figure 44.
SEASONAL HUNTING

The icons above show the different types of activities available in this site. These icons relate to the map routes in figure 46. Although the icons show what is on offer currently at this site, much of the landscapes health has prevented these from occurring at all. Bird watching and bird hunting are the most popular activities of this area. This is because these are the most accessible activities as there are a number of bird hunts located around the wetland. DOC manages a viewing hunt and then the rest are manmade ones by the hunters (see figure 46 for locations). Walking in the area is difficult as the only path is the stop bank running through the wetland, and this comes to an abrupt end to private land. The track has to be walked back on itself, which takes 50 minutes to walk in total. Kayaking and biking are the other two recreational activities available. Biking can be done only on the roads highlighted in figure 46 and there were no visible unloading areas for kayakers to use.

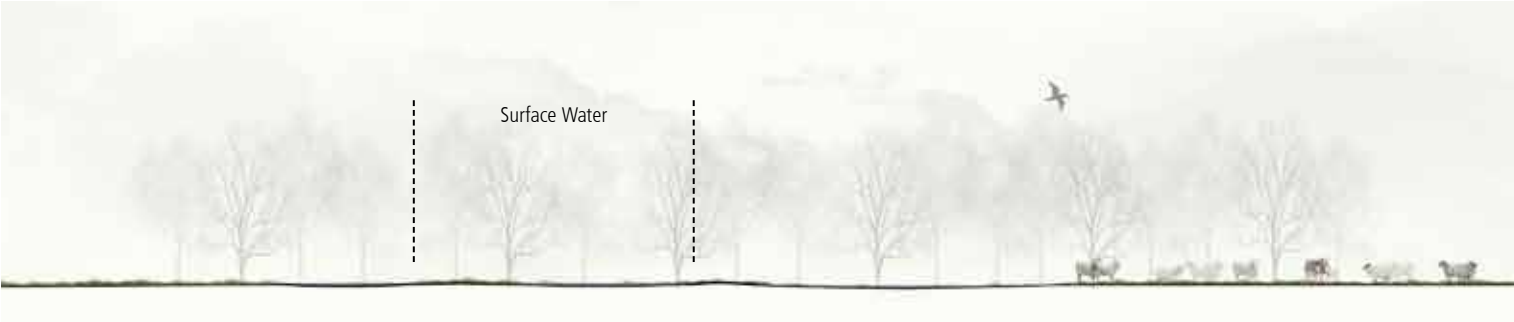


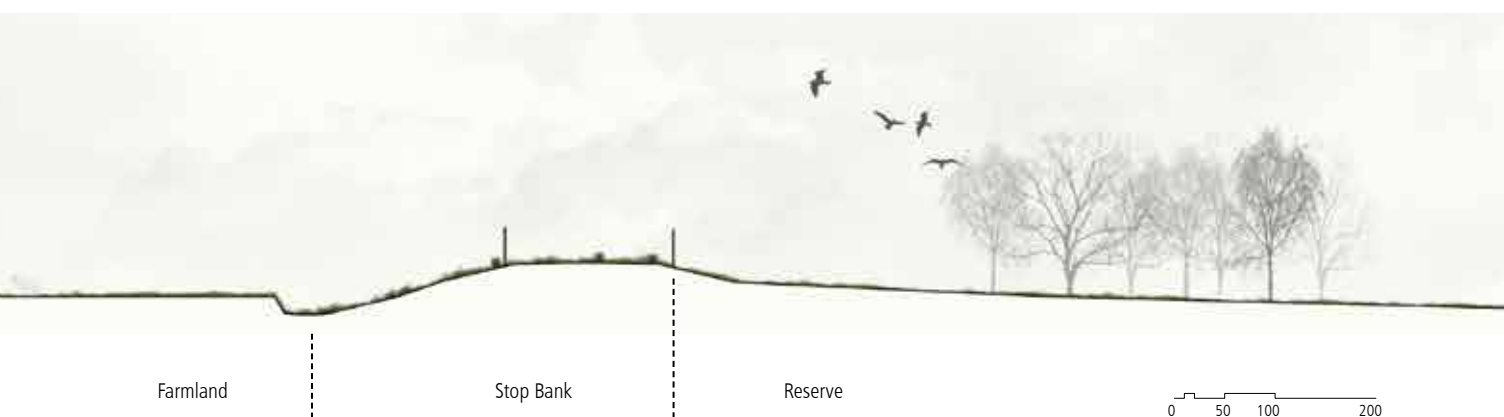
Figure 45. CURRENT LAND SECTION Aa (FIGURE 46)
Section showing the gradient through the site, the main difference being the stop bank rise

5.5

RECREATIONAL ROUTES



Figure 46. RECREATIONAL ROUTES
Map highlighting the routes and locations of the recreational activities in the site



5.6

THE PROBLEMS



Figure 47. AERIAL FLOOD PHOTOS
Photographs comparing Tuhitarata flood of 1947 and 2004

Common themes across New Zealand have previously been discussed, but these issues are relevant to this chosen study site. Within Boggy pond/Matthews Lagoon area intensive dairy farming is apparent in the matter of the surrounding water ways are unhealthy. It does not help the problem that these water ways are not well protected by vegetation either. This creates room for exotic species to start growing as seen in figure 49.

This farming is occurring in land blocks that are mostly unproductive because of the amount of surface water it holds. Because of the natural contours of the land and previous knowledge that there was a larger wetland system, the water still collects in pockets in the fields. This makes grazing harder for the animals and pollutes this water as it drains into the ground.

Both these problems mixed with the decrease in land space provides an opportunity for a design space.



Figure 48. SHETLER BELTS
Image showing minimal native shelter belts for agricultural blocks



Figure 49. WILLOW TREES
Image of the dying willow trees after being sprayed by the council



Figure 50. STOP BANK PATH
Image of the grassy and muddy stop bank pathway running through the wetland



Figure 51. SURFACE WATER
Image showing the collection of water in the gradient of the land



Figure 52. SURFACE WATER TWO
Image showing the collection of water in the gradient of the land

5.7

INITIAL HUNCHES

LAND



*nature
wetlands*

P1 - Degraded and unhealthy wetland which is now under protection

SHAPING



*farming
agroforestry principle*

P2 - Land is generally wet for the winter months, difficult to farm on

PEOPLE



*culture
education*

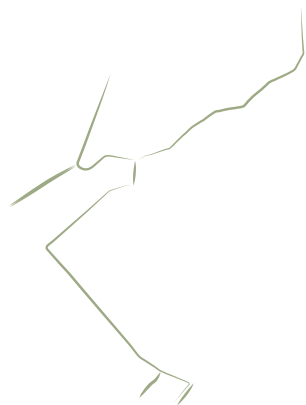
P3 - Public vs Private, how do they coexist ?

Above is a word diagram from the initial hunch planning made after studying the analysis of the region was completed. It is formed from the key words in the title of this thesis to outline three central typologies to design from the problems arisen in this study area. This then helped to develop preliminary design solutions for each typology. Working in this manner helped to keep the study focused in staying aligned with the research purpose.

Figure 53. INITIAL HUNCH PLANNING
Diagram formed from the key words in the title of this thesis, outlines three central typologies to design

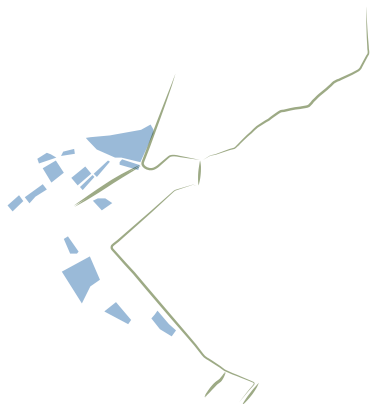
5.8

HUNCH SOLUTIONS



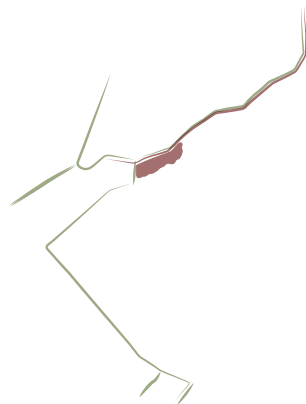
Riparian planting around water body areas that are adjacent to agricultural areas. Stage one of the water treatment process.

Figure 54. PLANTING
Diagram of riparian planting ideas



Wetter areas are unproductive, reclaim these as wetland areas for a natural water treatment process. Stage two of water treatment process.

Figure 55. WETLAND AREAS
Diagram for potential wetland areas



Showcase the water treatment process. Showing the community and public that agricultural processes can occur along side with healthy streams and water bodies, if the right steps are taken.

Figure 56. RECREATION
Diagram of possible new recreation areas



Figure 57. HUNCH DIAGRAM
Diagram of problems and hunch design outcomes for Boggy Pond/Matthews Lagoon

5.9

REFLECTION

By choosing to focus on Boggy pond/Matthews Lagoon, the study can appropriately examine and detail the problems of the site. It can then work into testing the values and theory into a design outcome. From the analysis gathered in this chapter and the understanding of the specifics of the site, three main problems have been singled out:

- 1.Degraded and unhealthy wetland which is now under protection
- 2.Land is generally wet for the winter months, difficult to farm on
- 3.Public vs Private, how do they coexist?

From these three problems initial hunch solutions have transpired into potential design outcomes. These can then start the design strategy off into a design direction to apply the typologies into the te aranga principles. These will influence tests to the chosen sites.

FINAL DESIGN

CHAPTER
SIX

From the earlier chapters the core idea and the problem of the region has been set out to introduce the design principles, Māori land values, and problems. This chapter gathers all these ideas together to show an overlook at the final design outcome along with the steps taken from the initial hunches. In pulling together all of the layers, it will show the solutions taken in aiding to answering the projects question and illustrate how the region could benefit from the Māori design principles used in the design.

This chapter will briefly show an overall look at the design features, to then in the following three chapters look in detail at the key layers LAND, SHAPING, and PEOPLE to reveal the links they all have in working alongside one another.

6.0

CHAPTER DIAGRAM : FINAL DESIGN

FINAL DESIGN

chapter six

Design overview:

Developed design

Layer connection

Typologies

Design principles

What the design means for the region as a whole

LAND

chapter seven

Reclamation of the lagoons

Two stage water cleaning system

Riparian planting

Natural wetland

Flood protection



MAURI TU

TAIAO

SHAPING

chapter eight

New sustainable land management scheme

Pā harakeke

Seasonal grazing plan



AHI KĀ

PEOPLE

chapter nine

Cultural reconnection and education

Promote new land management scheme

Provide a place for culture to flourish

See the Māori face within the landscape



TOHU

Figure 58. CHAPTER DIAGRAM

Diagram indicating the structure of the following chapters, explaining the final design elements

DESIGN PRINCIPLES

1. TOHU

the wider cultural landscape

Acknowledges a Māori world view of the wider significance of tohu/landmarks and their ability to inform the design of specific development sites

Celebrates local and wider unique cultural heritage and community characteristics that reinforce sense of place and identity

4. TAIAO

the natural environment

Local flora and fauna which are familiar and significant to *mana whenua* are key natural landscape elements within urban and/or modified areas

Natural environments are protected, regenerated or enhanced to levels where sustainable *mana whenua* harvesting is possible

3. AHI KĀ

the living presence

Mana whenua live, work and play within their own rohe

Living iwi/hapu presences and associated *kaitiaki* roles are resumed within urban areas

2. MAURI TU

environmental health

The wider development area and all elements developments within the site are considered on the basis of protecting, maintaining or enhancing mauri

The quality of *wai*, *whenua*, *ngahere* and air are actively monitored

LAND

MAURI TU

TAIAO

Mauri tu was a chosen principle in influencing the regeneration of the wetland lagoons. These were based of improving the water quality of the surrounding waterways, while also providing habitat environments for endangered species of the area. Re-introducing them back in protecting what was once lost. This cleaner water quality would directly affect in improving the water quality of Lake Wairarapa to generate more importance in the natural treatment process for the rest of the region.

Taiao was a chosen principle in influencing the importance of using native flora back into the landscape. This was done through the designed vegetated buffer zones along the waterways as the second water treatment stage. These would also act in protecting the pā harakeke, the sheep, and creating biodiversity corridors to connect into the reserves in the ranges either side of the district.

SHAPING

AHI KĀ

Ahi kā was a chosen principle in influencing the change in fibre production from pine to harakeke fibre. By producing a new land management scheme to accommodate a pa harākeke it resolves many of the issues in the study area. Fibre production can be economic income, along with the many other qualities of the plant, it protects the land in flood events, allows for sheep grazing in between for a multiuse system, bring biodiversity and brings a cultural aspect as a design solution to a farming problem.

PEOPLE

TOHU

Tohu was a chosen as a design principle to use in the influence of education in the management plan. This principle has helped to illustrate a learning areas: a lookout for the pā harakeke, and a weaving area for cultural education. These both with the idea to help promote *mauri ora* and *kaitiakitanga* towards the environment and its inhabitants.

6.2

DESIGN IDEA

From working with the land and understanding what it is trying to tell the people of the land, a reclamation of the old lagoons once located in this area is proposed. These lagoons have been crafted into a wetland system as a part of a natural process to treat the water system as stage two. These wetlands contain islands within their shapes to aid in regenerating native water fauna back into the area. This regeneration also allows for native flora to attract native land species.

The land use of the area has been changed to a pā harakeke. This begins the stage one of the water run off treatment from the adjacent agricultural plots alongside the harakeke fields. It also allows for flood protection and an economic value for the fibre harvesting of the plants, among other uses explained in the following chapters. To show case this new multi-use land management system recreational areas have also been included to educate the community and public on how precise the land we use is, as there is a dominos effect to what we do as humans. Public harvesting areas for fibre collection and weaving is incorporated to involve the Māori culture back into the land, and provide a space for generations to pass on knowledge of the culture within the land they are speaking of.

All layers connect to promote a new sustainable way of land uses and farming from the land around New Zealand.

6.3

DESIGN PLAN



Figure 59. DESIGN MASTER PLAN

Map of final outcome, sustainable land management scheme with a pā harakeke and public areas of interest

EXPLODED LAYERS



Figure 60. EXPLODED LAYERS
Diagram exploding out the layer typologies of the final design outcome, how individual design move works

	1. Education	People play an important part in this design. Firstly, people are the reason for this design. The way in which humans have treated the landscape they live on results in land that is unhealthy. To change this, people need to understand they are guardians of the land.
	2. Reclaimed Lagoons	In a two stage water management system, with the second stage of a wetland system to help clean the water in the Wairarapa region. Using planting and different depths of wetland lagoons, this will act as a natural way in cleaning the existing waterways.
	3. Pā Harakeke	For a more sustainable material to pine, a pā harakeke has been proposed to harvest its fibres. This plant also provides for flood protection to the area, leaf matter can be used for other needs, and it can be multi farmed with sheep grazing.
	4. Riparian Planting	As stage one to the new water management system, native riparian planting will be used in all waterways edges and farmland boundaries. This will naturally treat all run off and ground water before it enters into Lake Wairarapa.
	Design Layers	All of the design layers relate to the typology of land, shaping and people. These typologies link to a Māori design principles that has influenced the design steps taken. Each one of these is explained in detail in their relative chapters.

6.5

NEW RECREATION



Figure 61.
HARAKEKE HARVESTING



Figure 62.
FAMILY ZONES



Figure 63.
LOOKOUTS

Along with the old recreation, new activities have been included in the design scheme. At stage one, a welcoming/entrance area is located. This is to clearly mark the entrance way into the reserve. It is additionally to highlight the current and significant ecosystem of the wetland that is now clear and full of abundant natives. Stage two, is an area for weaving and education. This space is located within the wetland complex, about 25-30 minutes' walk along the stop bank pathway. This area has space allocated for harvesting and weaving of the native plants growing in the area, and is a space for all parties to learn about the Maori culture and the landscape they live in. Stage three, is a lookout area located along the top of the lagoon island. This stage is similarly an educational stage but more on the ideas of the environment and the role people play within this system. To prompt the Maori cultural values held about the land and thāt we as humans are the guardians to this living resource. With these new activities comes a wider route system which can be seen in the map adjacent, figure 64.

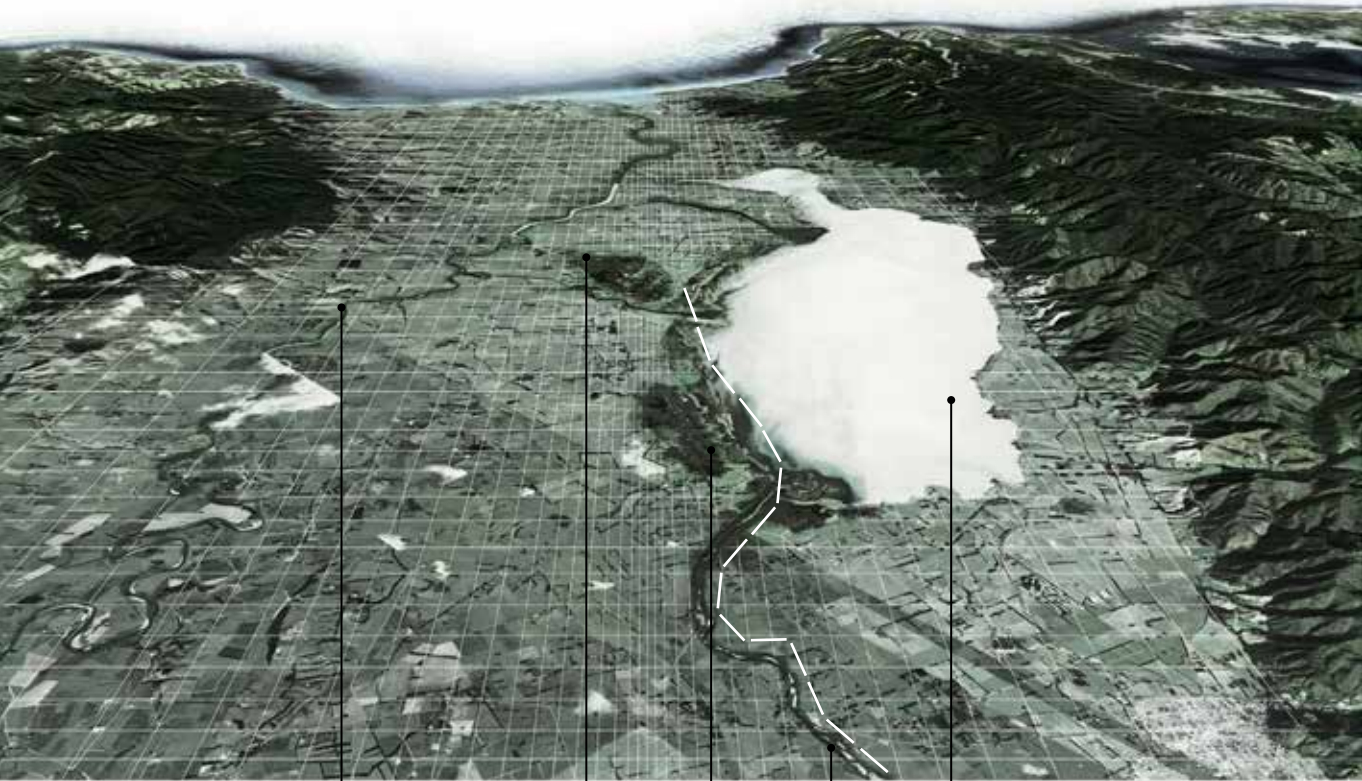
6.6

NEW RECREATIONAL ROUTES



Figure 64. NEW RECREATIONAL ROUTES

Map indicating the added recreation routes for the design scheme, including old routes for reference



Ruamahanga River Boggly Pond/Matthews Lagoon Tauherenikau River Lake Wairarapa
Jk Donald Reserve

Figure 65. REGIONAL LINK MAP
Highlighting the link through the Wairarapa Moana, regional link

6.7

REGIONAL BENEFITS

Looking back into the Wairarapa Moana area as a whole, Boggy pond/Matthews Lagoon is situated at the lower end of the Moana systems. This then provides a regional cleansing from initial water ways from further out of the region by passing through this new wetland before entering the lake. With this in mind, the education of this ecosystem could influence the outer lake wetland systems into designing better management practices so that their surrounding waterways can too be treated before entering into the lake body. The Wairarapa Moana parks could form a development trail from one to another which this system could be an integrated part of in the future development of the region.

In the cleaning of the regions water ways and promotion of sustainable land management schemes more people would visit the Wairarapa region, encouraging tourists and day time travellers. This helps boosting local economy and makes the district a place to stop and explore much like its current sister towns.



Figure 66. DOC BIRD HUT
Image of the DOC owned bird hut located along stop bank path

6.8

OVERVIEW OF DESIGN MOVES

This thesis has worked into understanding and analysing the site Boggy pond/Matthews lagoon. In focusing on the Māori culture and the narratives on the region, past notions could be applied into generating design typologies. With these typologies, the Te aranga design principles were linked. In doing so generated the final design outcome of this chapter design moves include:

1. Regeneration of old wetland system
 - Clean water ways: Stage two
 - Provide habitats
 - Flood mitigation
2. Generate a new sustainable land management scheme
 - Pā harakeke
 - Intentional sheep grazing
3. Riparian planting along water course
 - Multi-tier native vegetation: Stage one
 - Increase biodiversity value
4. Cultural public spaces
 - 3 spot focal points
 - Education
 - Cultural reconnection

STAGE ONE: LAND

CHAPTER
SEVEN

This chapter explains one of the layers used in detailing the final design solution. By breaking up the design into typologies it can show them layer by layer and specify the functions of each individually to then show the connection of how they with one another. Beginning from initial hunches, through concept design, case study research and to design development the process shows how this layer takes part in the regeneration of old lagoons in the area. It then looks in reclaiming these to form wetland islands to cleanse the water entering the lake to improve the quality, to prevent flooding events, cater for new fauna species and promote the Māori values towards the land.

7.0

CHAPTER DIAGRAM : LAND

FINAL DESIGN

chapter six

Design overview:

Developed design

Layer connection

Typologies

Design principles

What the design means for the region as a whole

LAND

chapter seven

Reclamation of the lagoons

Two stage water cleaning system

Riparian planting

Natural wetland

Flood protection



MAURI TU
TAIAO

SHAPING

chapter eight

New sustainable land management
scheme

Pā harakeke

Seasonal grazing plan



AHI KĀ

PEOPLE

chapter nine

Cultural reconnection and education

Promote new land management
scheme

Provide a place for culture to flourish

See the Māori face within the
landscape



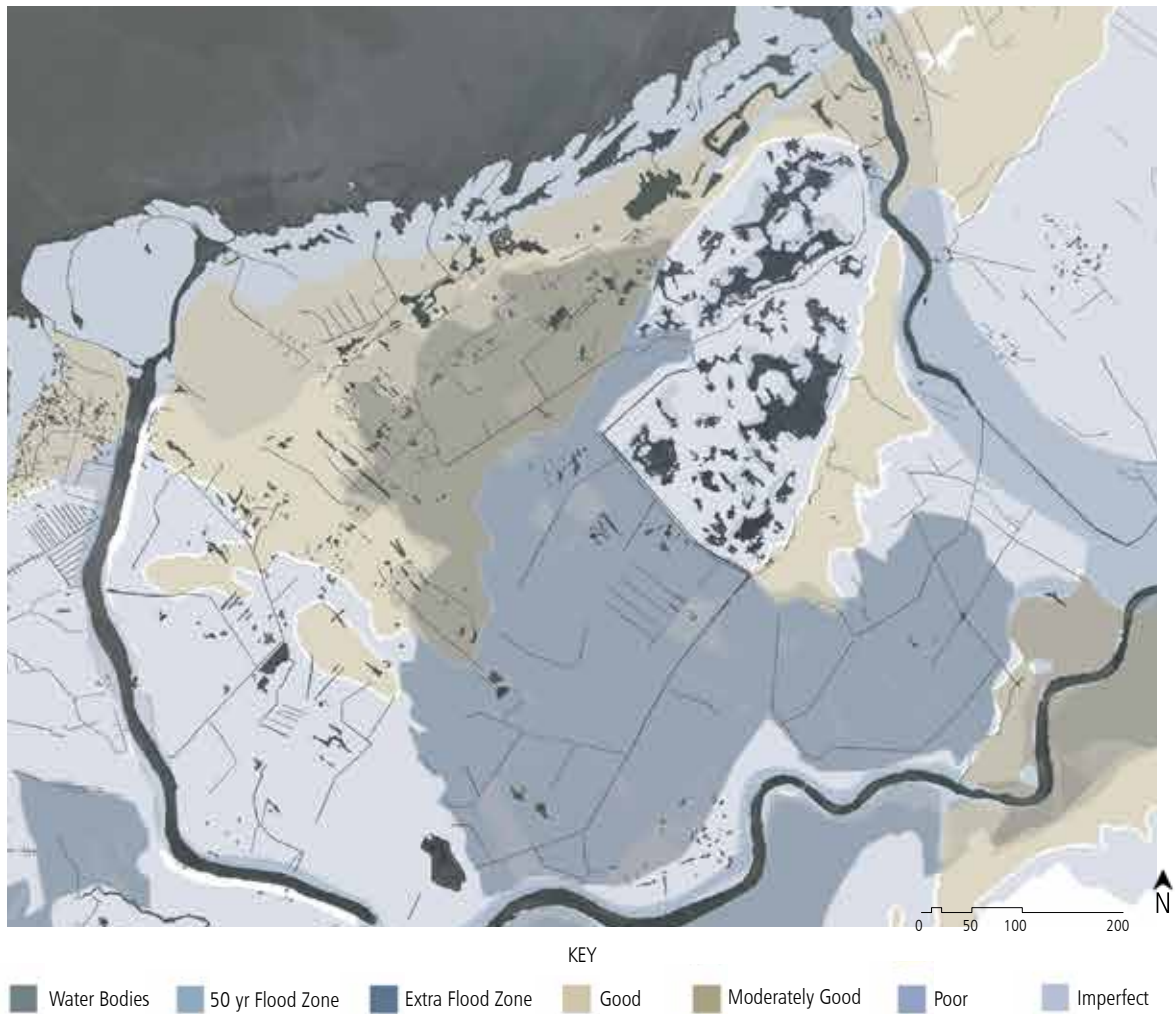
TOHU

Figure 67. CHAPTER DIAGRAM

Diagram indicating the structure of the following chapters, explaining the final design elements. Highlighting LAND

7.1

COMBINED LAYERS ONE

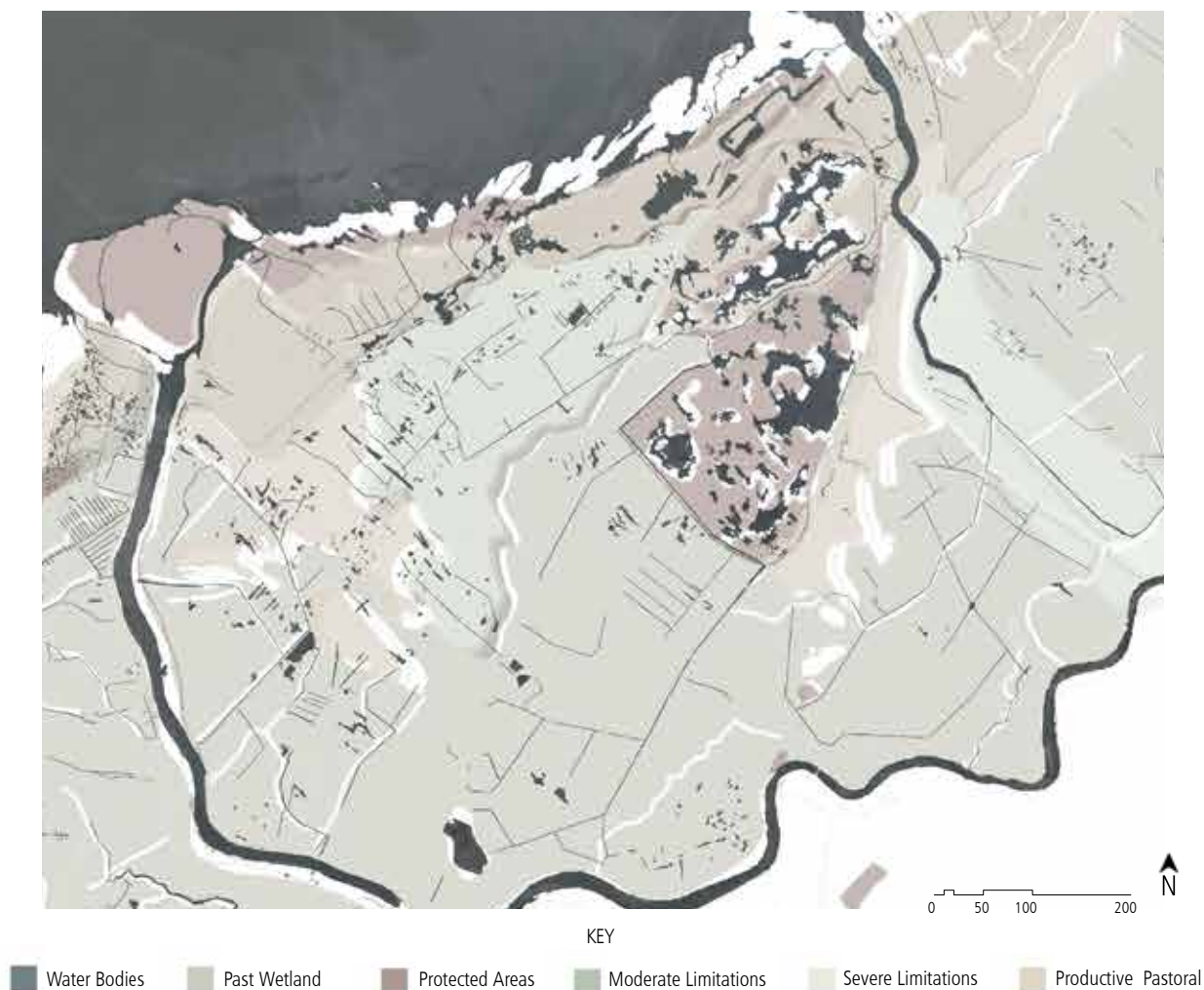


In overlaying the layers of the analysis, patterns begin to form and tell the story in more detail by showing the connection of how one affects another. In combined layer map one the overlay layers are water, flooding and soil drainage. Conclusions drawn from this map gives notions that where the private agricultural land sits the land is under threat from flooding events, however has good – moderate soil drainage.

Figure 68. COMBINED LAYER ONE
Overlay map of water, flooding and soil drainage anaylsis layers

7.2

COMBINED LAYERS TWO



In combined layer map two the overlay layers include water, protected land, past wetlands and land capability. Conclusions drawn from this overlay provides knowledge that the past wetland areas are mostly under protection as reserve and the land with the most serve limitations for capability are the surrounding land blocks, which is the agricultural land. These providing the most challenging design areas to test.

Figure 69. COMBINED LAYER TWO
Overlay map of water, protected land, past wetlands and land capability analysis layers

7.3

PAST MAPS

1959



Figure 70. 1959 PAST MAP

1989



Figure 71. 1939 PAST MAP

2009



Figure 72. 2009 PAST MAP

These images are from 1959 – 2009 and show the Boggy pond/Matthews Lagoon area. By looking at the images in sequence, a major physical change can be noticed in the land use and water bodies. This picture timeline, physically shows the scars of the degradation of water bodies in the Wairarapa Moana expanse and is a result of draining water bodies to make way for more agricultural land space. Other factors in this change would be from natural occurrences such as earthquakes and sea level rise. These images back up the combined layer maps in that where the old water bodies were, this old layer is still present in today's landscape that the lay of the land collects pockets of water as seen in images figure 51 and 52, page 81.

The challenge for the design is to now, how can *mauri tu* be used as a design principle to solve the issues of the land being wetter in winter months, prone to flooding in heavier rainfalls, unproductive, and being a significant ecosystem lost through European intervention. This project looks into how the people shaped the land. To turning it around so that the land shapes the people. Shaping it back to how it should have always stayed while working with supporting the incomes that are in this region.

7.4

CASE STUDY



Figure 73. NICKS HEAD STATION
Image showing final design



Figure 74. SPECIES PLANNING
Image indicating species habitats



Figure 75. NICKS HEAD WETLANDS
Image showing final design of wetlands

Nicks Head Station

Located in the Gisborne coastline near Muriwai, Nicks Head station is described as “exemplary project that successfully explores the integration of aesthetics and function” (Barrett). It is a master plan design involving culture, agriculture, sustainability and the regeneration of old wetlands. Constructed and designed by Nelson Byrd Woltz Landscape Architects, the three time award winning project has been talked about and published as the new way to design. The site was first seen in 1350 when Māori settlers sailed in and it compromised as a wetland system. However this was drained by farmers for extra grazing.

The design includes wetland islands that have each been designed for a specific fauna species habitat requirements (seen in figure 74). The heights and sizes of the water bodies relate each to their own species in the idea to re-introduce the species to the site. This case studies provides a string starting point for the study test to use the qualities from this project and apply them to Boggy pond/Matthews Lagoon wetland system.

In creating an environment space for reintroducing native species back into the area was a design element that matches with the Māori design principle of *taiao*, the natural environment. By providing this space this design has giving significance to the native species that once flourished in this area. Giving *mana whenua* back into the landscape that has the connection to the culture. In using this element this thesis design study could apply this notion and produce natural environments to protect and enhance sustainable *mana whenua* of Boggy pond/Matthews lagoon.

CONCEPT WETLAND

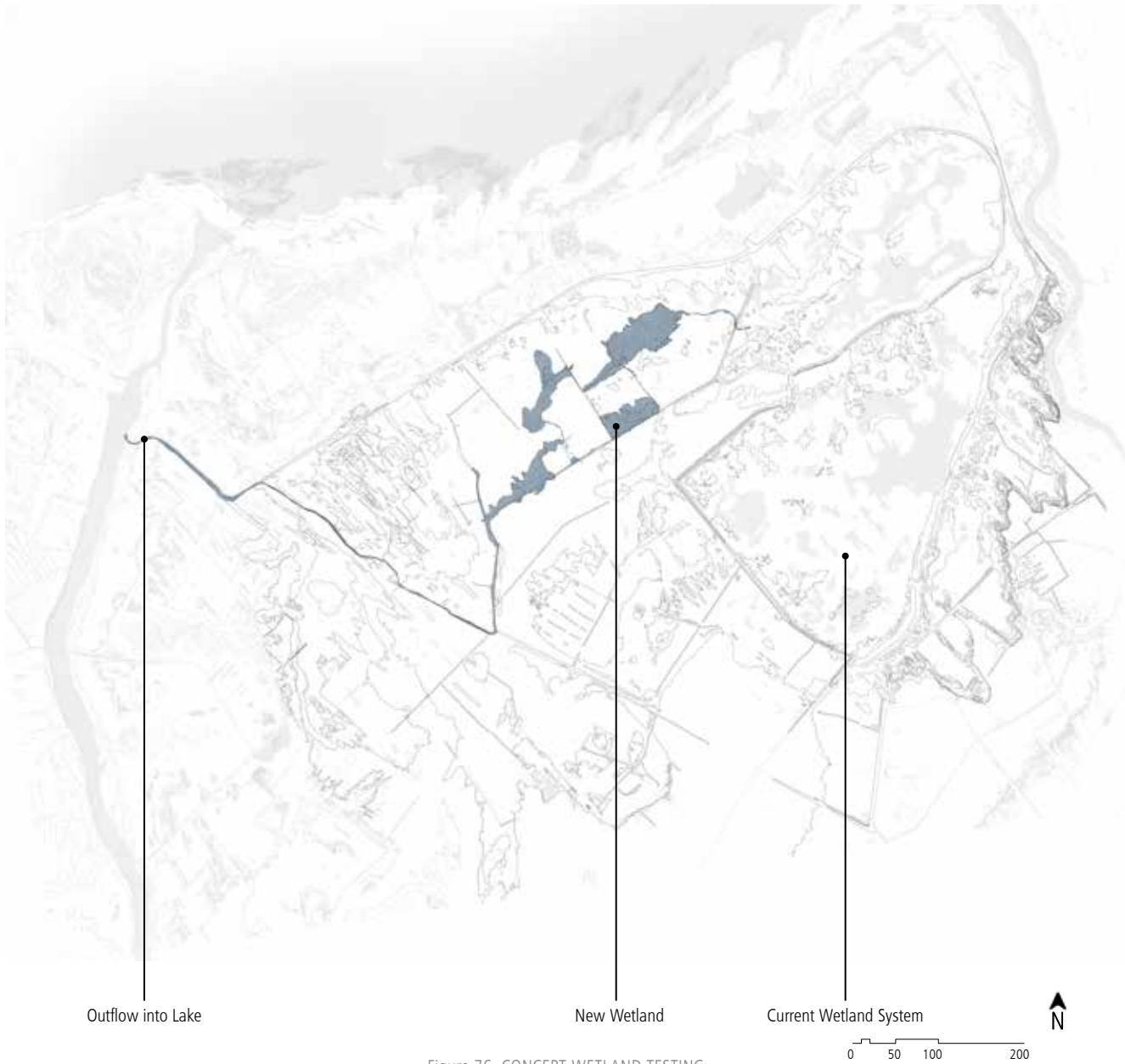


Figure 76. CONCEPT WETLAND TESTING
Map of design testing wetland shape and area from the case study information and past maps

To heal the land and the surrounding water bodies around it a new land management system is to be designed. Part of this system is to outline areas for a natural wetlands to occur, in treating the different types of run off located in the site as stage two, stage one is riparian buffer planting zones. From the natural contours and the layout of the old lagoons in the past map 1989, this concept maps out the outline where these wetlands could be tested. Connecting to the outflow from Boggy Pond, flowing through the current agricultural private land, to then exit out into the Wairarapa Lake.

By applying the case study literally to how the land sits, it limits the options that could happen within this testing. This concept outcome is too small of wetland bodies to include islands for native species and it is too small of a wetland to treat the run off currently needed for the catchment area.

Next steps suggest that more research is needed into the species habitats that are to occupy the lagoon areas and the catchment size of the site to treat the water run-off. This will accurately give values to the wetland body size and the lagoon island areas.



Figure 77. WETLAND SHAPE

Image highlighting the wetland areas that have been applied directly into the concept test

7.6

SPECIES



Longfin Eels

Brown Mud Fish
Gaint Kokopu

Figure 78. FISH ICONS
Icons to symbolise the fish species



Grey Duck
Tui
Kereru

White Heron
Australian Bittern
Banded Dotterel

Figure 79. BIRD ICONS
Icons to symbolise the bird species

After supplementary look into the particulars of each species and their habitat requirements (see appendix B), and wetland construction guides, a developed wetland shape has been generated (see figure 79). Within this wetland body there are plenty of small alcoves for the native fish species mentioned previously to make home to. The wetland body itself is a subsurface flow wetland which contains a series of designed basins of varying water depths, areas to moderate the flow of the water for the pollution treatment and agricultural run-off and vegetation planting plan.

7.7

DEVELOPED WETLAND

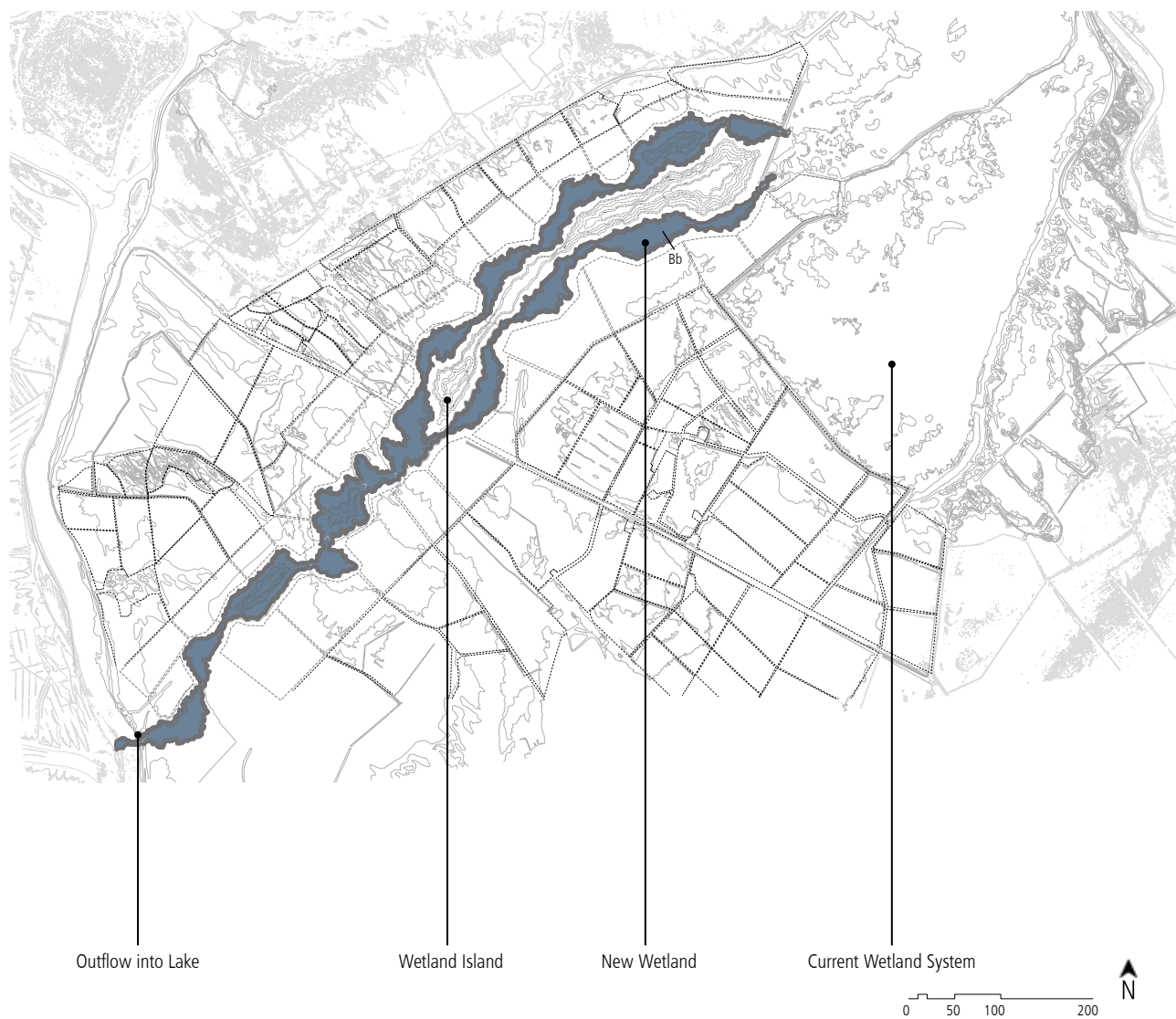
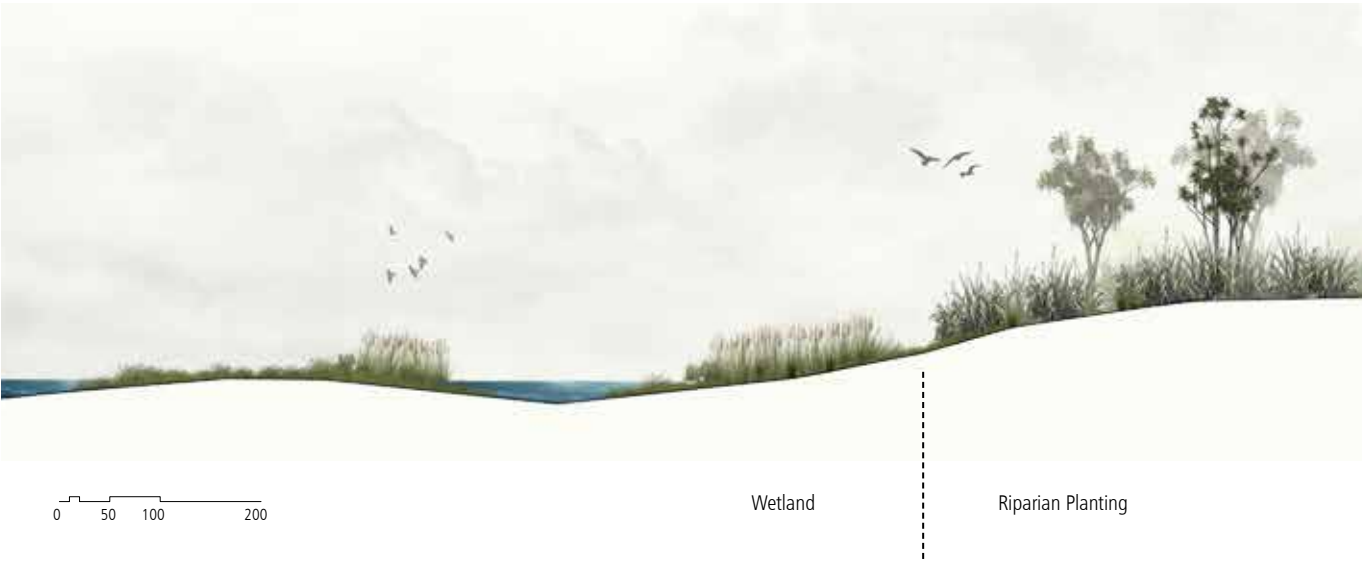


Figure 80. DEVELOPED WETLAND
Design map of the developed wetland and island system for Boggy pond/Matthews Lagoon site plan

WETLAND DESIGN



Wetland systems are a natural water cleaning instrument that provides habitat spaces, biodiversity values, cultural links, and recreational activities within its scheme. By including this type of designed element into the design it work as a supplementary stage to the riparian planting and in doing so provides the region with a clean and uncontaminated resource entering into Lake Wairarapa.

In coming to this conclusions as a design outcome of choice, wetlands was influenced by the Te Aranaga principle of mauri tu and its attributes. Using the attributes as a guiding tool, analysis of the land being wet, prone to flooding, and in the past once a wetland lagoon it was only left to the aims of the study of regenerating natural systems to lead the design outcome into a constructed wetland system.

Figure 81. WETLAND SECTION Bb (FIGURE 80)
Section showing the wetland lagoons, wetland islands and the riparian planting zone



Figure 82. NEW WETLAND
Image describing what the wetland looks like within the Wairarapa region

WETLAND HYDROLOGY

The wetland systems is created through a cut and fill process, which means contour adjustments were calculated and drawn out into the new form. This form links onto the current wetland system of Boggy Pond.

The two stage water treatment cleanses the run off from either side of the system before the outflow connects onto the Ruamahanga cut off river, before exiting into Lake Wairarapa.

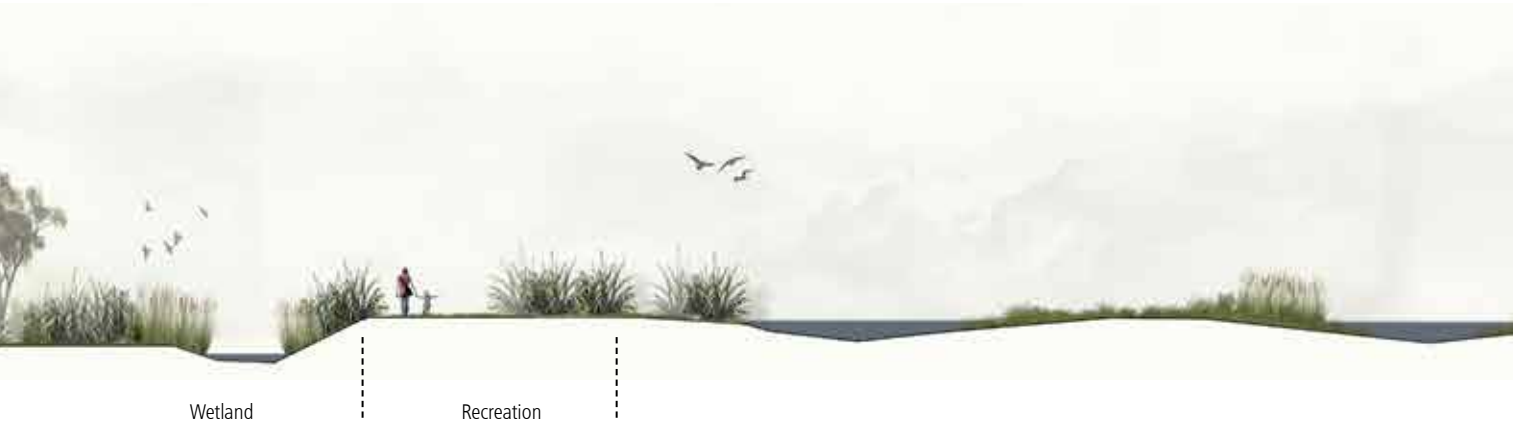


Figure 83. FULL LAND SECTION Cc (FIGURE 84)
Section across the design showing recreation, wetland, vegetation buffer and harakeke production with sheep grazing

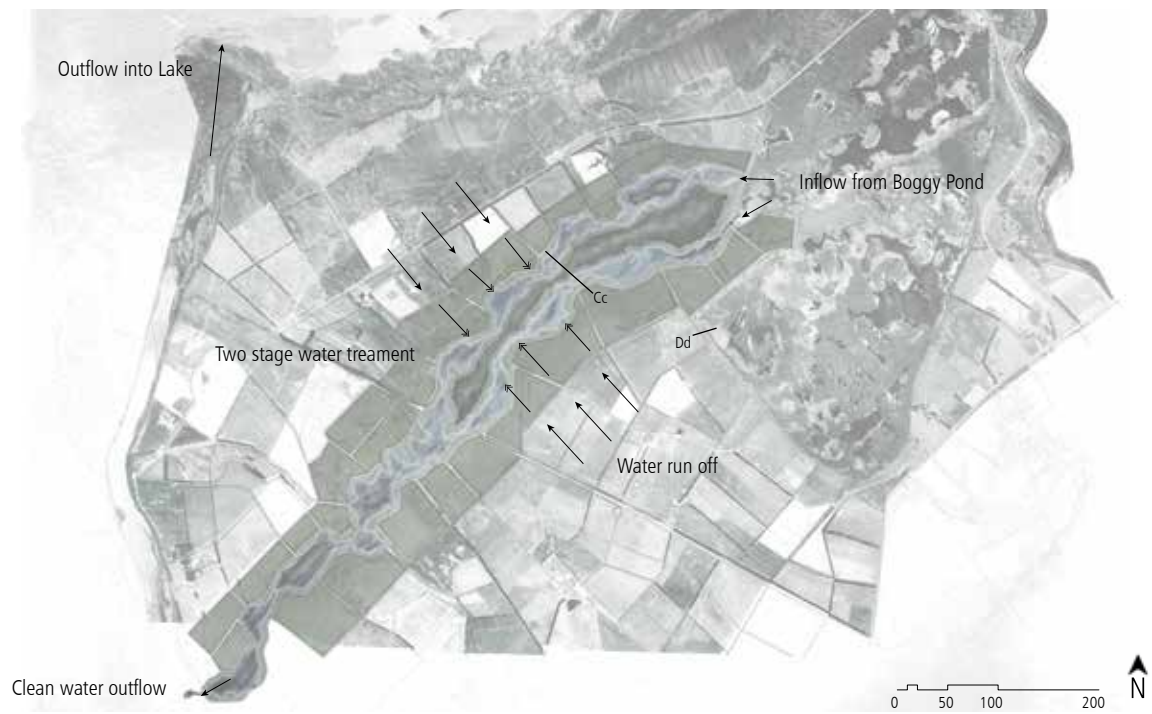


Figure 84. HYDROLOGY OF NEW SYSTEM
Image showing the hydrology of the water movement through the designed site



RIPARIAN PLANTING

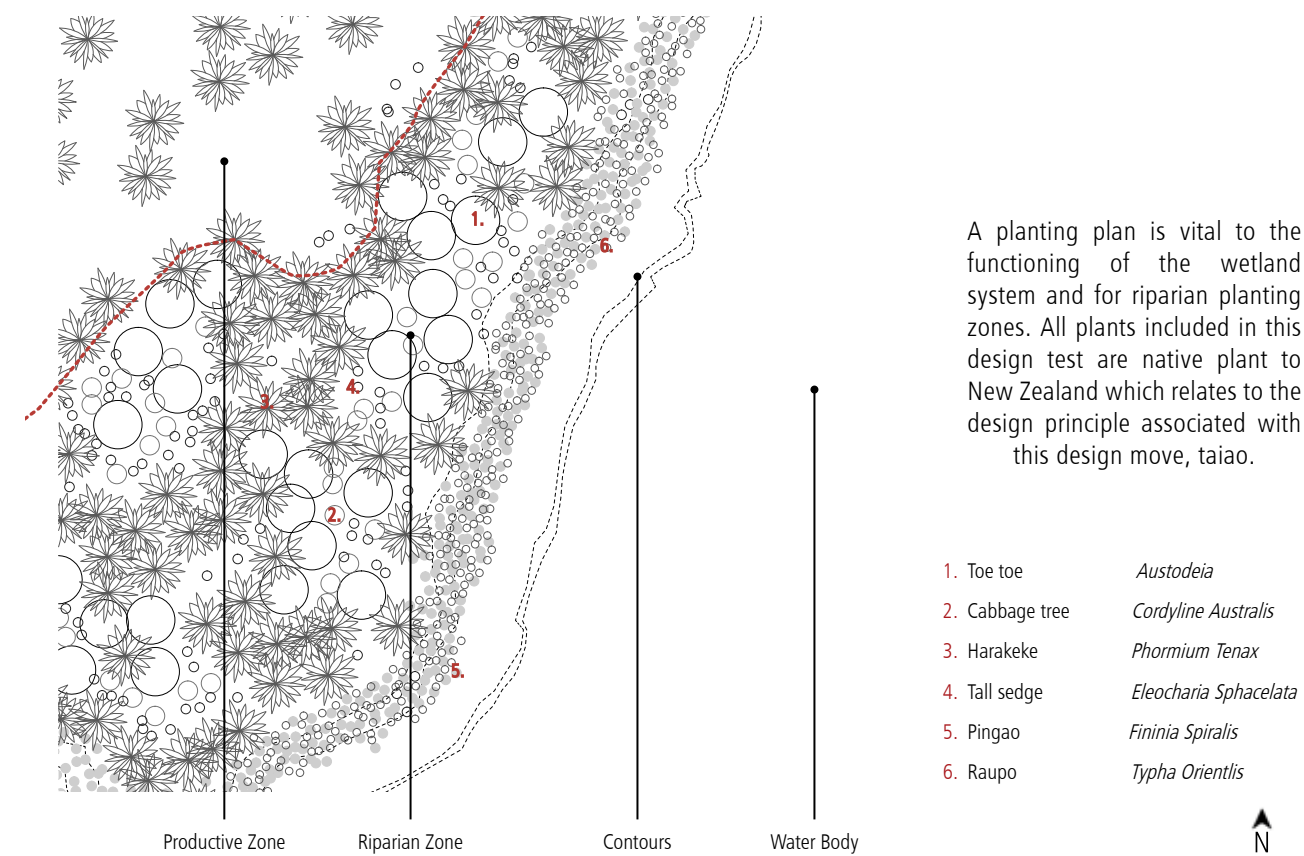


Figure 85. PLANTING PLAN

Image showing a portion of the riparian planting within the vegetation zones, stage one of water treatment



Figure 86. RIPARIAN PLANTING SECTION Dd (FIGURE 84)

Section showing the agricultural relationship with riparian planting and wetland lagoon



Riparian buffer zones are for the purpose of treating water run-off from its surroundings, when the plant dies the pollutants it's taken out from the land is put back in. To combat this issue all of the plants used are native plants in which can be harvested and used within Māori cultural practices. With these plants being harvested, the pollutants can exit the land and self-seeding will occur to replace those being harvested.

Figure 87. RIPARIAN PLANTING
Image describing what the vegetated buffer zone looks like with the farming land blocks

STAGE TWO: SHAPING

CHAPTER
EIGHT

This chapter works in detailing the shaping part of the design. Now this is not the physical shaping that the land has undergone but the shaping of how we as humans treat the land. This is detailing the new sustainable land management plan in the location of pā harakeke that has been proposed for this site test. Through working off the research and analysis, this chapter again works through initial design testing, research, and details final development stage. Using multi use farming from the concept of agroforestry, this land management scheme involves seasonal planting and stock rotation plans for the most productive use of land space within the Wairarapa Moana wetlands.

8.0

CHAPTER DIAGRAM : SHAPING

FINAL DESIGN

chapter six

Design overview:
Initial design
Development design
Layer connection
Typologies
Design principles
What the design means for the region as a whole

LAND

chapter seven

Reclamation of the lagoons

Two stage water cleaning system
Ripirain planting
Natural wetland

Flood protection

↑
MAURI TU
TAIAO

SHAPING

chapter eight

New sustainable land management
scheme

Pā harakeke

Seasonal grazing plan

↑
AHI KĀ

PEOPLE

chapter nine

Cultural reconnection and education

Promote new land management
scheme

Provide a place for culture to flourish

See the Maōri face within the
landscpae

↑
TOHU

Figure 88. CHAPTER DIAGRAM
Diagram indicating the structure of the following chapters, explaining the final design elements. Highlighting SHAPING

H A R A K E K E U S E S

Harakeke Plant

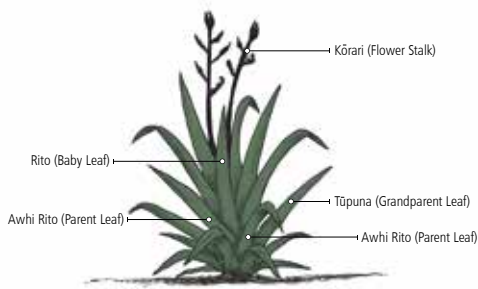


Figure 89. HARAKEKE PLANT
Diagram indicating the plant structure and the different elements that make up the plant

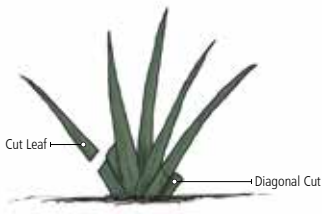


Figure 90. HARVESTING HARAKEKE
Diagram showing what leaves to harvest off the plant, cutting in an angle to promote growth



Figure 91. HARVESTED LEAVES
Diagram showing the harvested harakeke leaves ready for use

Plant Uses

Green Matter

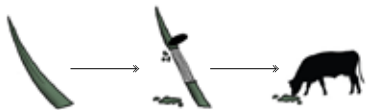


Figure 92. GREEN MATTER
Diagram showing the stripping of the green matter can be used for cow feed

Fibre

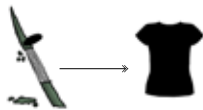


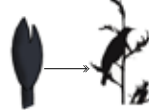
Figure 93. FIBRE
Diagram showing the green matter stripped to reveal the fibre

Oil



Figure 94. OIL AND FLOWER
Diagram showing uses of oil into skin care and the flower attracting native bird life

Flower



After extraction of the fibre has occurred, the green matter stripped off the fibres can be reused into cow feeding to the surrounding farms, as a natural option. This can be sold on as an added economic values from the fibre production. Perfect for the summer months when hay is unavailable.

After the leaves of the plants have been harvested the green matter is carefully stripped from the leaf and what is left can be spun into fibre for the use in textiles. The textile make up of harakeke fibre has been tested against that of its current competitor, wool. Results show that harakeke was more durable and warmer.

The leaf produces oil after cutting, this can be collected and can be utilised into a number of skincare products and health uses.

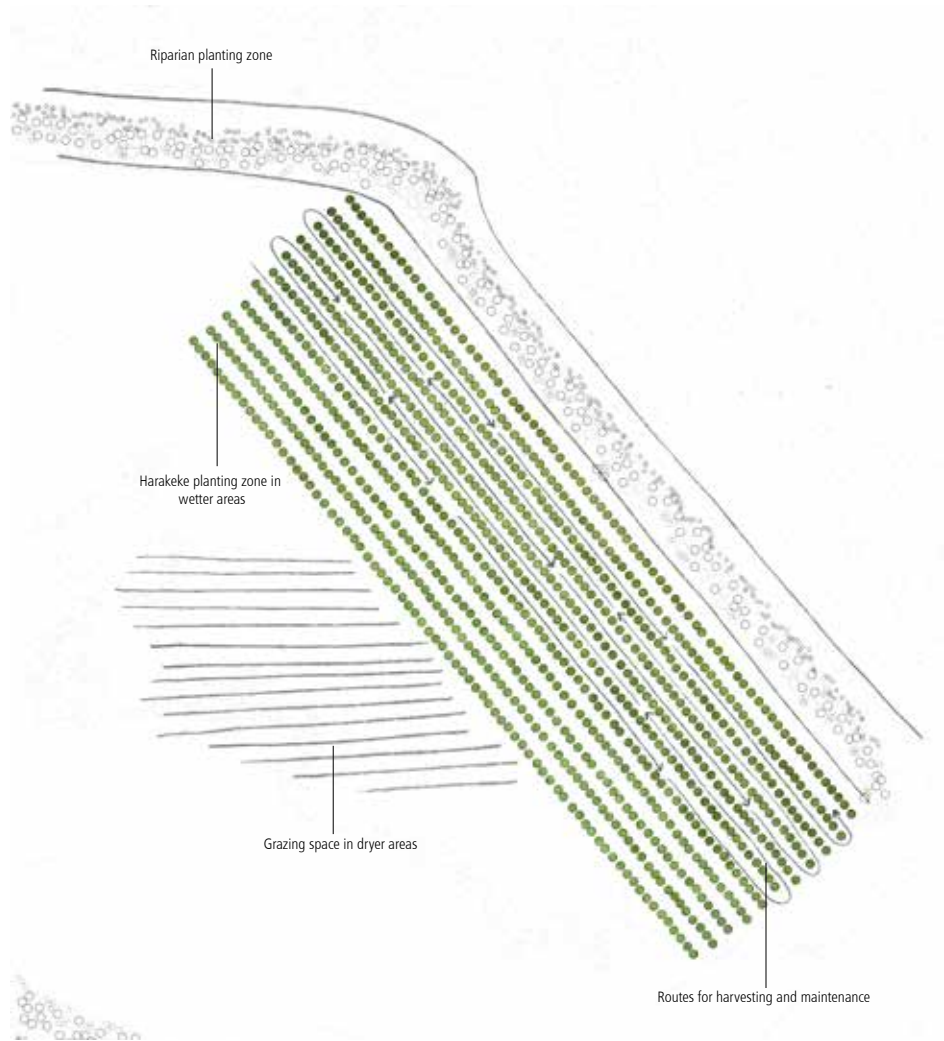
The flower of the plant is one of the most common native birds in New Zealand, the tui favourite food source. This promotes local biodiversity

Phormium tenax was once a thriving resource used for a range of different practices with the Māori culture before European settlement into New Zealand. With the European settler came new materials and practices that the indigenous culture was bright eyed to. One of these was the use of pine for fibre production. Pine forestry, as pre-discussed is fighting for the land space that people are fighting for. With the numbers of the population increasing so does the demand for wood and space. The industry can only provide a one use land system, as the trees hit maturity their canopies shade all of the groundcover leaving it uninhabitable beneath it. Which is where the understandings of the past aid this concept for harakeke fibre production.

Fibre production could be a viable and sustainable resource for future practices. Harakeke has multiple uses after the leaf of the plant has been harvested. As the diagram adjacent shows there is little left of the plant for waste.

By using this as a substitute to pine it allows for multi-use farming to occur as sheep grazing can be stock rotated within the harakeke plots. Harakeke plants correspondingly enjoy wet areas, in the event of a flood the leaves lay down and then rise back up once the water has drained away. Making them a perfect substitute to pine for this region.

H A R A K E K E T E S T I N G O N E



With the design concept set, the arrangement of the plants was the next step taken. This hunch test was based off orchards, vineyards, and vegetable plantations. Growing in parallel lines in single forms to one another. This idea aids with harvesting as farmers can pick row by row and then move on to the next field. However for the aesthetics it is very manmade which is in contradiction to the natural formation of the plant when growing freely.

Figure 95. HARAKEKE TESTING ONE
Map showing the testing of harakeke planting for design concept

8.3

H A R A K E K E T E S T I N G T W O



To be culturally meaningful this hunch testing is in a more organic formation. This allows for better public experience when visiting alongside the space. It gives a feeling of being in a reserve type environment like in the past as opposed to a manmade formations.

Figure 96. H A R A K E K E T E S T I N G T W O
Map showing the testing of harakeke planting for design concept

CONCEPT PĀ HARAKEKE

Designing testing of where the Pā harakeke land blocks would situate within the current agricultural blocks. As farming is a vital source to this design, re managing the land blocks into practical and productive land uses was the better option for this test site.

The design consists of wetland, with wetland islands, riparian multi-tier buffer zones, pā harakeke blocks and then into agricultural farming blocks. The testing concept in figure 00 shows the pā harakeke land blocks nestled around the initial wetland water bodies.

Because the wetland shapes developed this concept design was to change also. This concept however would not have been suitable as the land blocks are not in manageable parcels, which would make for stock rotation to be complicated and unnecessary.

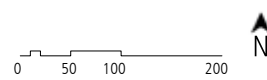


Figure 97. PA HARAKEKE TESTING
Map indicating the concept testing of the location of the pā harakeke

DEVELOPED PĀ HARAKEKE

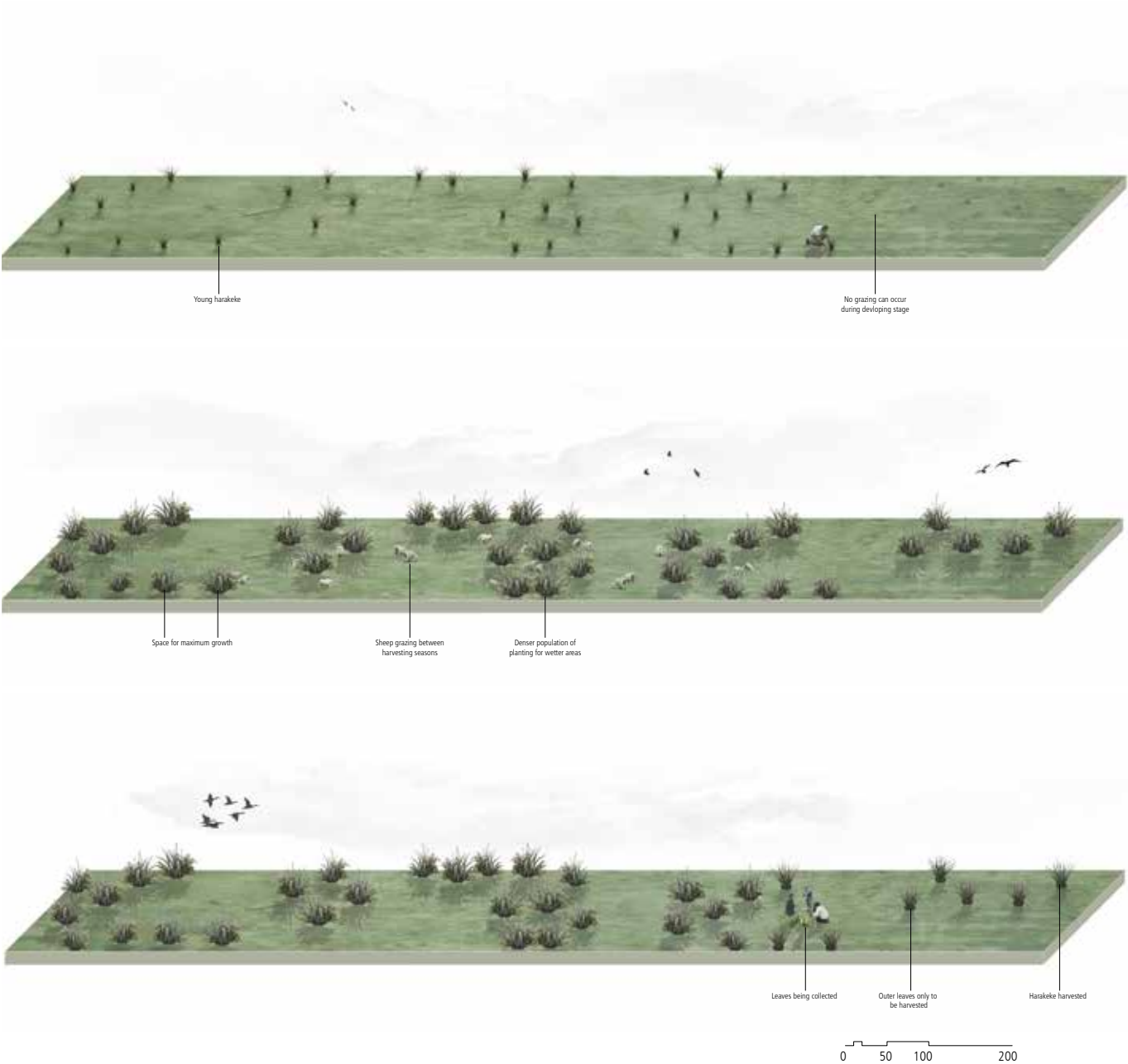


Figure 98. DEVELOPED PĀ HARAKEKE
Design map of developed land management plan

After developed design on the wetland lagoons was finalised, the pā harakeke could work in fitting in around this shape. Figure 98 shows this final development stage for the harakeke blocks now located on the edges of the wetland system. The harakeke planting will act as stage three of run off treatment but is not necessary and the main focus to locating the production parcels next to the wetland lagoons is in flood events the plant will act as a sponge in soaking up some water before reaching to the agricultural blocks. This ensures, in such an event that both practices can continue on, as the harakeke plant will survive and rise up after. This design provides the region with specialised job opportunities and cultural significance to old practices.

The existing infrastructure and land parcel blocks have been minimally changed in the design process to make the integration of this solution more accepting. Surrounding the pā harakeke parcels are re managed agricultural land parcels. These parcels have been typed as dairy, dairy support, beef and mixed. With the pā harakeke typed as fibre production and sheep this is because “cattle are very fond of it, and chew the leaf till the fibre is left hanging from the plant” (McGruddy).

SEASONAL PROGRAMMING



After seeding the plant, harakeke is “slow growing for the first two years, but will begin rapidly bulking up from the third year” (McGruddy). After three years the plant will hit maturity and flowers will begin to grow. For the two years of growing no sheep can be grazing within these land blocks (see figure 102 for stock rotation).

Figure 99. GROWING
Transect showing the growing of the harakeke plant (opposite)

When the plant reaches two years, sheep can begin to graze within these land parcels. The plants will provide shelter from the sun and the wind giving the sheep a happier and healthy lifestyle to grow in than a typical grazing field.

Figure 100. GRAZING
Transect integrating sheep grazing between plant formations (opposite)

The harakeke “leaf takes up to 18-22 months to grow” (McGruddy). Which means harvesting and maintenance should occur in rotational timeframes to follow these. Leaves must be harvested before they decay begins. Maintenance is to take place to ensure all leaves remain healthy with the removal of decaying leaves. Outer leaves are harvested only for cultural reasons, with careful consideration to cut away from the plant, allowing water to collect in the base for regrowth. As the whole plant is not taken there is no need for replanting and growth rates are faster than replanting.

Figure 101. HARVESTING
Transect showing the harvesting process in collecting the outer leaves of the plant (opposite)

STOCK ROTATION PROGRAMME



Figure 102. STOCK ROTATION PROGRAMME
Map demonstrating grouped field parcels for stock rotation and harvesting

As this design involves a multi-use land scheme each element must be monitored. A scenario as follows describes one way in which the zoning could be implicated into the rotation programme. Zone one indicates parcel blocks where seeding can occur, these will be in growth for two years before sheep grazing can occur. Zone two and three are then available for sheep grazing in rotation to commence. After the two year growing period sheep can be grazed in zone one, while seeding can take place in zone two. Sheep grazing is then only in zone one and three. After 20 months zone one is ready for harvest, sheep grazing can happen in zone three. Following harvesting, 4 months after harvesting, sheep can graze in zone two and three. In using a stock rotation programme it allows for the harakeke plant to grow fully for maximum fibre collection, and adequate grazing can take place within surrounding fields.

P Ā H A R A K E K E D E S I G N



Phormium Tenax was chosen as it is a lowland or swamp flax which can fit with existing farm systems. However this design pushes this idea to expand into a pa harakeke for fibre production in a sustainable land management scheme. Harakeke is “robust, fast growing, wind tolerant, flood tolerant, drought tolerant, light tolerant and frost tolerant” (McGruddy).

The living presence is the translation from ahi kā in the Māori design principles. By introducing harakeke as an alternative to pine it associates the Māori culture into the design as they can harvest in the same place as where their ancestors would have harvested in the past. It promotes a new sustainable use of land for multi-use practices to occur and encouraging public activities in the nearby reserve.

Figure 103. HARAKEKE SECTION Ee (FIGURE 102)
Section showing plant harvesting in one field with sheep grazing adjacent



Figure 104. PA HARAKEKE
Image describing the multiuse farming principle of harakeke production and sheep grazing in between

STAGE THREE: PEOPLE

CHAPTER
NINE

Education is a key player in this design. This mean that people are too. They way in which we have slowly been treating the landscape we live on has affected it in such ways that the land is unproductive, our water ways are becoming incredibly un healthy and it directly affects us as we grow our resources from this unhealthy land. The growing space of land has also become an issues in more recent years with the growth in population needing more housing and resources for these new numbers and climate change with the melting ice caps decreases the land still. This design works in a new sustainable farming management practice, with recreational activities surrounding it. By including recreational interests to the area it will bring people to see this new way of farming. A three focal spot approach has been taken to the design to welcome all in, provide a cultural space for harvesting, weaving, and storytelling, to then telling its own story in how the land uses work with one another the provide a natural and sustainable way of living with the land.

9.0

CHAPTER DIAGRAM : PEOPLE

FINAL DESIGN

chapter six

Design overview:
Initial design
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Typologies
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LAND

chapter seven

Reclamation of the lagoons

Two stage water cleaning system
Ripirain planting
Natural wetland

Flood protection

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MAURI TU
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scheme

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Seasonal grazing plan

↑
AHI KĀ

PEOPLE

chapter nine

Cultural reconnection and education

Promote new land management
scheme

Provide a place for culture to flourish

See the Maōri face within the
landscpae

↑
TOHU

Figure 105. CHAPTER DIAGRAM
Diagram indicating the structure of the following chapters, explaining the final design element. Highlighting PEOPLE

PUBLIC DESIGN SPACES

Initial sites visits made it very clear that unless a clear direction on going to this place it is easily missed. The site has the opportunity for lots to offer however needing direction in how to do so. Figure 106 highlights the focal areas for the added public design spaces to the current recreational uses.

Spot one offers a welcoming/entrance area upon arrival. This space is designed in featuring this wetland system to the public so is easily accessible.

Spot two is located by walking 25 – 30 minutes along the stop bank pathway to an open flat area. This area has been designed for native plant species to grow and be harvested available to the public. With open space looking out over Matthews Lagoon.

Spot three promotes the new land management scheme that has been created with a lookout area above the wetland island. This allows for the public to view out over the regenerated wetland, island and see the pā harakeke.



Figure 106. THREE FOCAL SPOTS
Map highlighting the areas of focus for design moves for public interaction

WELCOMING/ENTRANCE



Figure 107. WELCOMING/ENTRANCE AREA
Image describing the welcoming/entrance area into Boggy pond/Matthews lagoon

9.3

WEAVING AND CULTURAL SPACE



Figure 108. WEAVING AND CULTURAL SPACE
Image describing a group of school children being taught about harakeke, looking out to Matthews lagoon

ISLAND LOOKOUT



Figure 109. ISLAND LOOKOUT

Image describing the view from the island lookout, wetland system in foreground with pā harakeke in background

9.5

I M P O R T A N C E O F P E O P L E

In every public design, people are vital element to consider when iterating concept ideas and are the first thought to what the design could be. However, in this design test the land came first. From understanding what the land needed to be designed to heal it, this influenced what value people then had to the outcome. In generating a sustainable land management scheme with a regenerated wetland system, it depicted the types of recreation to be created for the public. This also prompted to where the main focal points of these public spaces would occur.

Culture was important to reintroduce into the site and was based off the principle of *tohu*. In using this principle the design could acknowledge the past people and the events that happened. By inviting people to share the public spaces with the environment there is the opportunity to educate them into the systems working in the design, while show casing why the land is important to cherish.

DISCUSSION

CHAPTER
TEN

10.0

The main theme to the research and the title of the thesis 'the land shaping the people' has been a vital topic to discuss. It has become very apparent that the current generation have little connection to the land they live on and that our past ancestors are the ones who began the idea of humanity shaping the land. With this now becoming a direct problem with the added external force that the land space we do have left is decreasing. Over the past couple of years the new challenge for humanity is how to show everyone this problem and how to get them to do something about it.

Currently, the topic of the population increase and climate control concerns has been heavily publicised into people's everyday lives. We recycle, promote walking, biking or taking public transportation to work, run vehicles on vegetable oil or electricity, generate heat and light from solar or wind power and the list can go on. Humanity is trying to change but to only small effects.

The investigation of this thesis was how to use Landscape Architecture design as a tool to solve current land issues at the tested site area to promote sustainable land use through cultural understandings of the land. This is an important issue to design for as the population increase, the resources needed increase and result of this the land available decreases. Where the government agencies have has minimal pushing this idea, could Landscape Architecture be the new tool to land problems.

In understanding if Landscape Architecture could be the way forward to promote sustainable living, conclusions must be drawn from the design of this research.

Was the research study able to answer the design question set, 'through the understanding of peoples values and beliefs of the land they live on, how can the form of the land prompt design opportunities in assisting the regeneration of the natural systems?' To answer this question it must be broken down into its relevant parts and in doing so answer it backwards.

What was the natural system?

A wetland ecosystem

Was this regenerated?

Yes. From the notion of regeneration explained in chapter four, the wetland was regenerated using the past traits and elements of the previous system found before the Europeans drained the water body. These were then applied to the site and modified to meet the current challenges of today's needs and the landscape it had evolved into with applications taken from case study research.

Was a design opportunity found from the form of the land?

Yes. The idea of regenerating a wetland system came from the initial research of the land being so wet. This led to the discovery through contour information and past maps that there once was a functioning wetland ecosystem in the site. Hence why all the water still wanted to gather in this space. Which opened up the opportunity to maintain and enhance mauri of the region by reclaiming the old lagoons into the wetland system.

Was the design outcome influenced from the understanding of people's values and beliefs?

As there is a mixture of cultures present in the area, a focus on the Māori and Pākehā culture was taken into account to uncomplicated the study. The Pākehā values were mainly based through agricultural land use, which was highly based from dairy farming. Therefore, the economic income value for the livelihoods of the current residents had to be considered into the design outcome. On the other hand, Māori people wanted to see the Māori face looking back at them in the landscape. Meaning the culture side of the land was most important to them.

Māori people cherish the land they live on, which is why the Te Aranga design principles were drafted for future design opportunities. In using these principles, a cultural land management design plan was tested for the site of Boggy pond/Matthews Lagoon. It includes a private income through harakeke fibre production and plant matter distribution. In this land management plan a programmed mixed farming aspect has been included for sheep grazing in between the harakeke plants. Promoting sustainable land management use for future designs.

With these principles the wetland system was created to clean the water run-off from the surrounding farming land blocks. This system also allows for new habitat spaces for past species to be re-introduced back into the area, boosting the biodiversity values of the area back to similar of what it was in the past. By drafting site typologies in initial hunch ideas it gave connection to the notions of what the Te aranga principle involved. These then lead to design solutions through these connections and influences.

Overall, the final outcome achieved a design solution by following in a logical order the aims and objectives and question set. It has produced a sustainable land management plan that allows for mixed use farming of harakeke and sheep grazing, while providing significant biodiversity back into the landscape. Re-introducing endangered species environments through the use of natural systems which work in cleaning the waterways of the catchment. With the main consideration of cultural understanding to what the land and the people needed for the region.

By using the thesis structure outlines in chapter one it allowed for appropriate testing to be made and drawn out conclusions to be critically analysed. These informed for the initial research and principles set, giving the design room to develop into the final outcome. Limitations of this meant that if the testing did not work, more testing would have to be undertaken, which takes time the research had limited of. Because of this, applying the found solutions into the other two sites has not occurred, Unanswered the question if these design principles and notions succeed in these cases. Would they have a different set of four principles? This would be the follow on from this research in testing these theories out in as much detail as the chosen site for this study project.

In coming into a conclusion of the design, the study has taken a cultural path in understanding the current tendencies of New Zealand and of the Wairarapa region. This may not have not been the case if a typical design site analysis using only GIS maps, contour information, and land use diagrams. In doing so the final outcome of the design has become strongly focused on the cultural side in generating design solutions. Because of this, the final outcome has produced a sustainable land management scheme that fits to the public and the private needs of the area so they can co-exists alongside one another.

The Māori design values has opened up the Landscape Architecture profession into a greater perception of what it means to design with the land and not just for it or for the people of it. From the new insight learnt about literally designing from the land up has giving the study research a strong depth into the rich ancestry events that occurred in the site. By listening to the land first and not the people, Landscape Architecture has proven as a useful tool in solving agricultural land issues and regenerating a lost wetland with providing a crucial link to the indigenous culture of *Aotearoa*, New Zealand.



Figure 110. PREDESIGN SKETCH IDEA
Sketch section image describing initial ideas for the site

GLOSSARY

GLOSSARY

MĀORI WORDS <http://maoridictionary.co.nz/>

Aotearoa - Māori word for New Zealand

Atua - ancestor with continuing influence, god, demon, supernatural being, deity, ghost, object of superstitious regard, strange being - although often translated as 'god' and now also used for the Christian God, this is a misconception of the real meaning. Many Māori trace their ancestry from atua in their whakapapa and they are regarded as ancestors with influence over particular domains. These atua also were a way of rationalising and perceiving the world. Normally invisible, atua may have visible representations.

Iwi - extended kinship group, tribe, nation, people, nationality, race - often refers to a large group of people descended from a common ancestor and associated with a distinct territory

Kaitiaki - trustee, minder, guard, custodian, guardian, caregiver, keeper, steward

Kaitiakitanga - guardianship, stewardship, trusteeship, trustee

Māori - A member of the aboriginal people of New Zealand

Mana whenua - territorial rights, power from the land, authority over land or territory, jurisdiction over land or territory - power associated with possession and occupation of tribal land. The tribe's history and legends are based in the lands they have occupied over generations and the land provides the sustenance for the people and to provide hospitality for guests

Marae - courtyard - the open area in front of the wharehau, where formal greetings and discussions take place. Often also used to include the complex of buildings around the marae

Mauri ora - Life, human well-being, spiritual well-being, physical well-being, and mental well-being

Moana - sea, ocean, large lake

Ngāti Kahungunu Ki Wairarapa - Iwi tribe of the Wairarapa region

Pā harakeke - Harakeke production

Pākehā - A white New Zealander as opposed to a Māori

Papatūānuku - In Māori tradition, Papatūānuku is the land. She is a mother earth figure who gives birth to all things, including people. Trees, birds and people are born from the land, which then nourishes them

Ranginui - atua of the sky and husband of Papa-tū-ā-nuku, from which union originate all living things

Rangitane O Wairarapa - Iwi tribe of the Wairarapa region

Tane - one of the offspring of Rangi-nui and Papa-tū-ā-nuku who was the first to see the sun shining under Rangi's armpit (according to some versions of the narrative)

Tangata whenua - local people, hosts, indigenous people - people born of the whenua, i.e. of the placenta and of the land where the people's ancestors have lived and where their placenta are buried

Taonga - treasure, anything prized - applied to anything considered to be of value including socially or culturally valuable objects, resources, phenomenon, ideas and techniques

Tapu - be sacred, prohibited, restricted, set apart, forbidden, under atua protection

Wahi tapu - sacred place, sacred site - a place subject to long-term ritual restrictions on access or use, e.g. a burial ground, a battle site or a place where tapu objects were placed

Whakapapa - genealogy, genealogical table, lineage, descent - reciting whakapapa was, and is, an important skill and reflected the importance of genealogies in Māori society in terms of leadership, land and fishing rights, kinship and status. It is central to all Māori institutions

Wharenuī - meeting house, large house - main building of a marae where guests are accommodated. Traditionally the wharenuī belonged to a hapū or whānau but some modern meeting houses, especially in large urban areas, have been built for non-tribal groups, including schools and tertiary institutions. Many are decorated with carvings, rafter paintings and tukutuku panels.



FIGURE LIST

FIGURE LIST

All figures uncouncted for are authors own

Figure 2. RESEARCH CONTEXT

Images to locate the area of the study research, in relation to Aotearoa, New Zealand

Source: Google Earth 2015

Figure 5. WAIRARAPA MOANA

Image outlying the water bodies included in the Wairarapa Moana, Southern region of the Wairarapa

Source: Google earth 2015

Figure 9. MAORI GARDENS

An artist impression of the gardens and village site, Palliser Bay

Source: Dr. Foss Leach and Kohunui Marae, Wairarapa Moana the Lake and its People book, page 47, Ian F. Grant, November 2012

Figure 10. TE ARANGA PRINCIPLES

Table explaining the Māori design principles. Name, meaning, attributes and applications

Source:

Figure 11. MAORI MEETING HOUSE DIAGRAM

Diagram showing the different elements which make up the meeting house

Source: Basil Keane. 'Marae protocol – te kawa o te marae - Mythology and history of marae protocol', Te Ara - the Encyclopedia of New Zealand, updated 21-Aug-13

URL: <http://www.TeAra.govt.nz/en/diagram/41366/wharehenui-and-the-gods>

Figure 14. MANAGEMENT TEAM DEVELOPMENT PLANS

PDF given to the researcher, the GWRC development plans for Wairarapa Moana Wetlands Park

Source: Greater Wellington Regional Council, Wairarapa Moana Wetlands Park Brochure, June 2010

URL: <http://www.gw.govt.nz/assets/Parks-and-Recreation/Wairarapa-Moana/wairarapa-moana-wetlands-park-brochure.pdf>

Figure 15. WAIRARAPA REGION

Image above shows the research study district

Source: Google Earth 2015

Figure 18. PIGEON BUSH MAP VIEW

Image showing the bird eye aerial of the site area. Farmland and reserve land

Source: Google Earth 2015

Figure 19. BOOGY POND/MATTHEWS LAGOON MAP VIEW

Image showing the bird eye aerial of the site area. Wetland system

Source: Google Earth 2015

Figure 20. ONEKE SPIT MAP VIEW

Image showing the bird eye aerial of the site area. Water mouth to sea

Source: Google Earth 2015

Figure 31. RESEARCH FOCUS AREA

Aerial map indicates boundaries of site. From the Ruamahanga cut off to Kahutara river

Source: Google Earth 2015

Figure 37. TABLE OF SIGNIFICANCE

Table taken from Wildlands significance report, stating the values held for Boggy Pond/Matthews Lagoon

Source: Paula Reeves, Matt Todd, Shona Myers, Roger Bawden, EXTENT AND SIGNIFICANCE OF WAIRARAPA MOANA WETLANDS AND LAKE POUNUI, March 2013, Greater Wellington Regional Council

Figure 47. AERIAL FLOOD PHOTOS

Photographs comparing Tuhitarata flood of 1947 and 2004

Source: Greater Wellington Regional Council, Wairarapa Moana the Lake and its People book, page 157, Ian F. Grant, November 2012

Figure 70. 1959 PAST MAP

Source: Interactive map

<http://www.mapspast.org.nz/>

Figure 70. 1959 PAST MAP

Source: Interactive map

<http://www.mapspast.org.nz/>

Figure 71. 1939 PAST MAP

Source: Interactive map

<http://www.mapspast.org.nz/>

Figure 72. 2009 PAST MAP

Source: Interactive map

<http://www.mapspast.org.nz/>

Figure 73. NICKS HEAD STATION

Image showing final design

Source: Michael Barrett, Nick's Head Station receives highest landscape architecture award, 9 April 2013

<http://architecturenow.co.nz/articles/new-zealands-best-landscape-architecture/>

Figure 74. SPECIES PLANNING

Image indicating species habitats

Source: Nelson Byrd Woltz Landscape Architects, 2012, Orongo Station Conservation Masterplan

<http://www.nbwla.com/projects/farm/orongo-station-conservation-masterplan>

Figure 75. NICKS HEAD WETLANDS

Image showing final design of wetlands

Source: Michael Barrett, Nick's Head Station receives highest landscape architecture award, 9 April 2013

<http://architecturenow.co.nz/articles/new-zealands-best-landscape-architecture/>





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APPENDICES

APPENDIX A - SEA LEVEL RISE

The following maps are intended to provide an insight into the future of the New Zealand coastline as a result of sea-level rise. The visual nature of maps, and the familiarity we have with our current coastline, combine to give a very human glimpse of how generations of New Zealanders may be impacted by climate change.

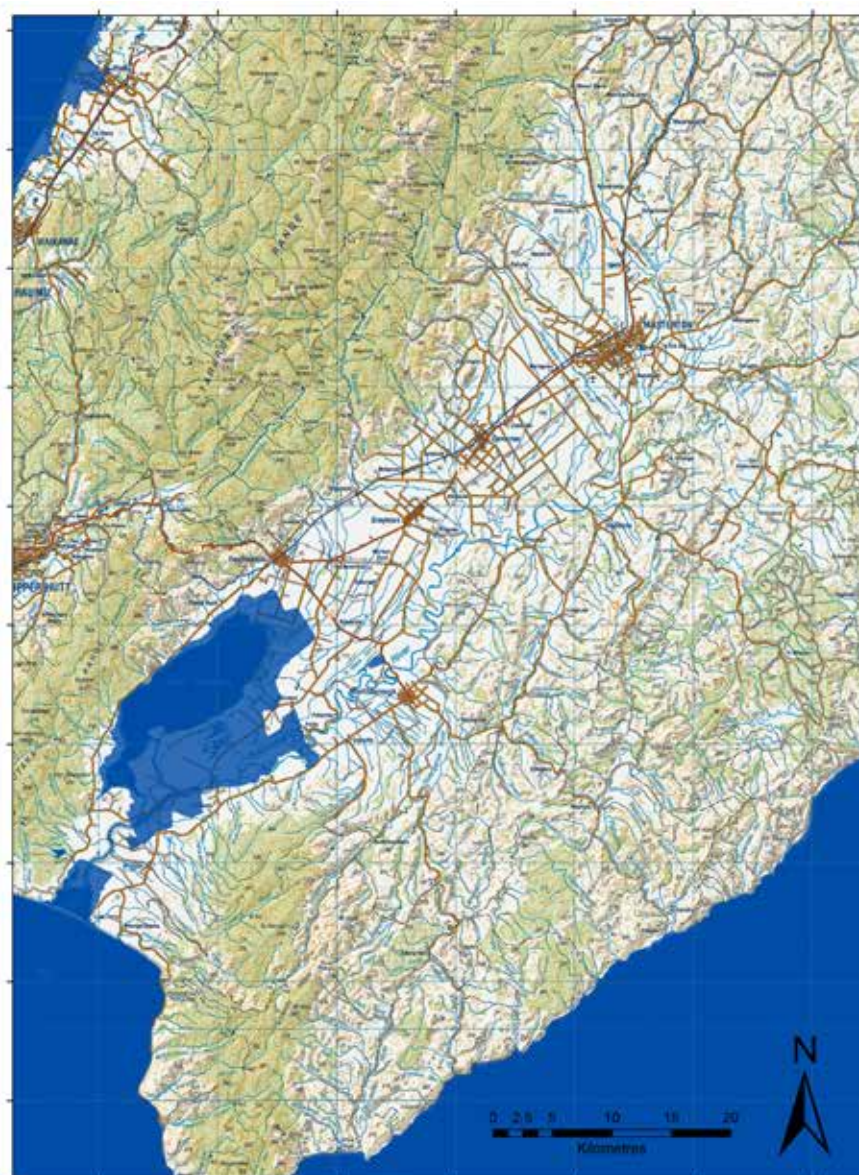
These maps present three scenarios; 10, 25, and 80 metre sea-level rise.

The 10 metre scenario is intended to show a sea-level rise which might result from rapid collapse of any one, or a combination of parts of the Greenland, West Antarctic and East Antarctic ice sheets. Evidence suggests that these ice-sheets are becoming increasingly unstable, and while their current and potential contributions to sea-level rise remain to be determined, they are certainly capable of delivering a 10 metre rise. Ice sheet collapse is extremely difficult to predict, the 10 metre rise could happen within the 21st century, or further into the future. A 10m sea-level rise would displace 14% of New Zealand's population (600,000 people)*.

The 25 metre scenario is intended to reflect a significant but far from complete melting of the Earth's freshwater ice. It is likely the Greenland ice sheet would be largely melted, but Antarctica would retain over half of its present ice. This scenario would likely follow the 10 metre rise as the ice sheets continued to collapse and melt. The timeframe for this scenario is extremely difficult to predict. While a 25 metre sea-level rise could occur within the 21st century, it is more likely that it would be in future centuries. A 25m sea-level rise would displace 43% of New Zealand's population (1.8 million people)*.

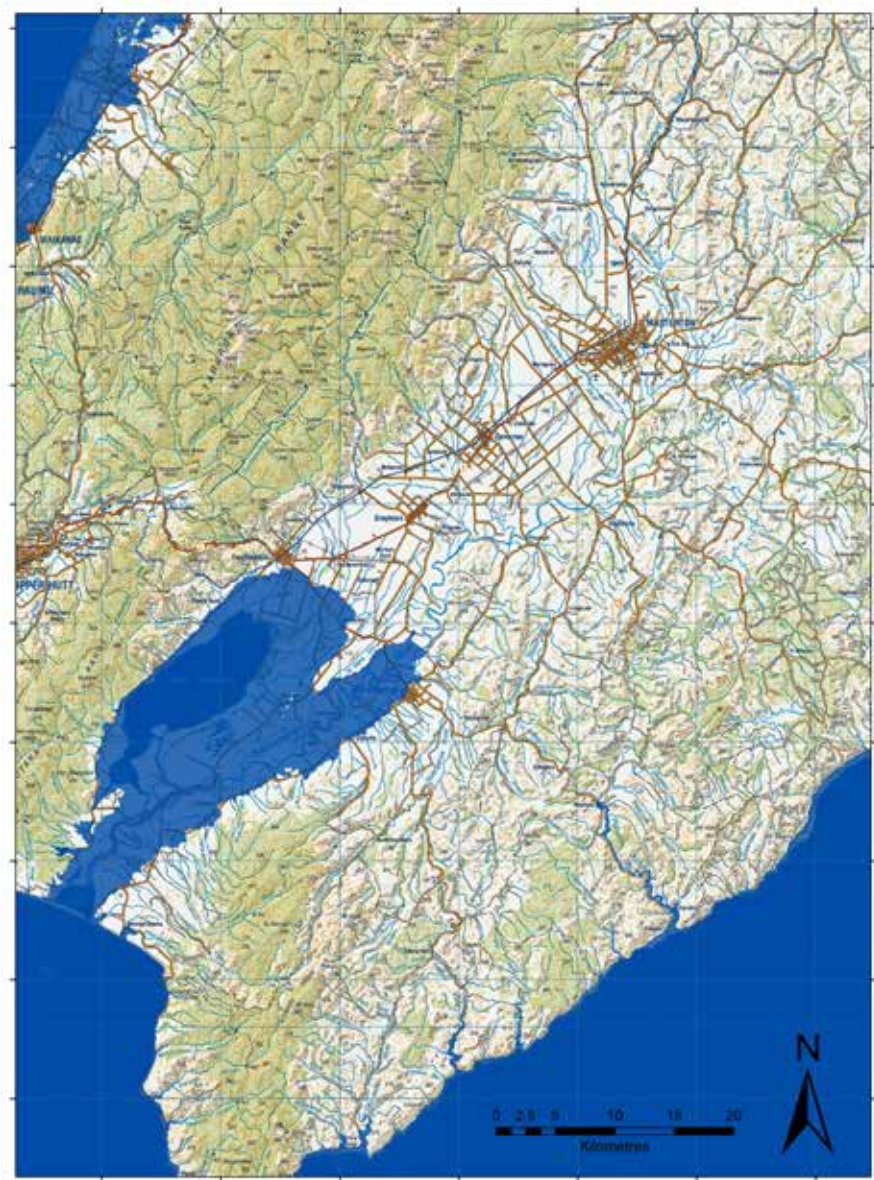
The 80 metre scenario represents complete melting of the Earth's ice sheets and major glaciers. This would most likely require a significant warming of the climate (at least 5 degrees). While this scenario would probably be played out over several centuries, it is certainly possible if global climate warming continues. An 80m sea-level rise would displace 80% of New Zealand's population (3.4 million people)*.

*Based on 2013 census data.



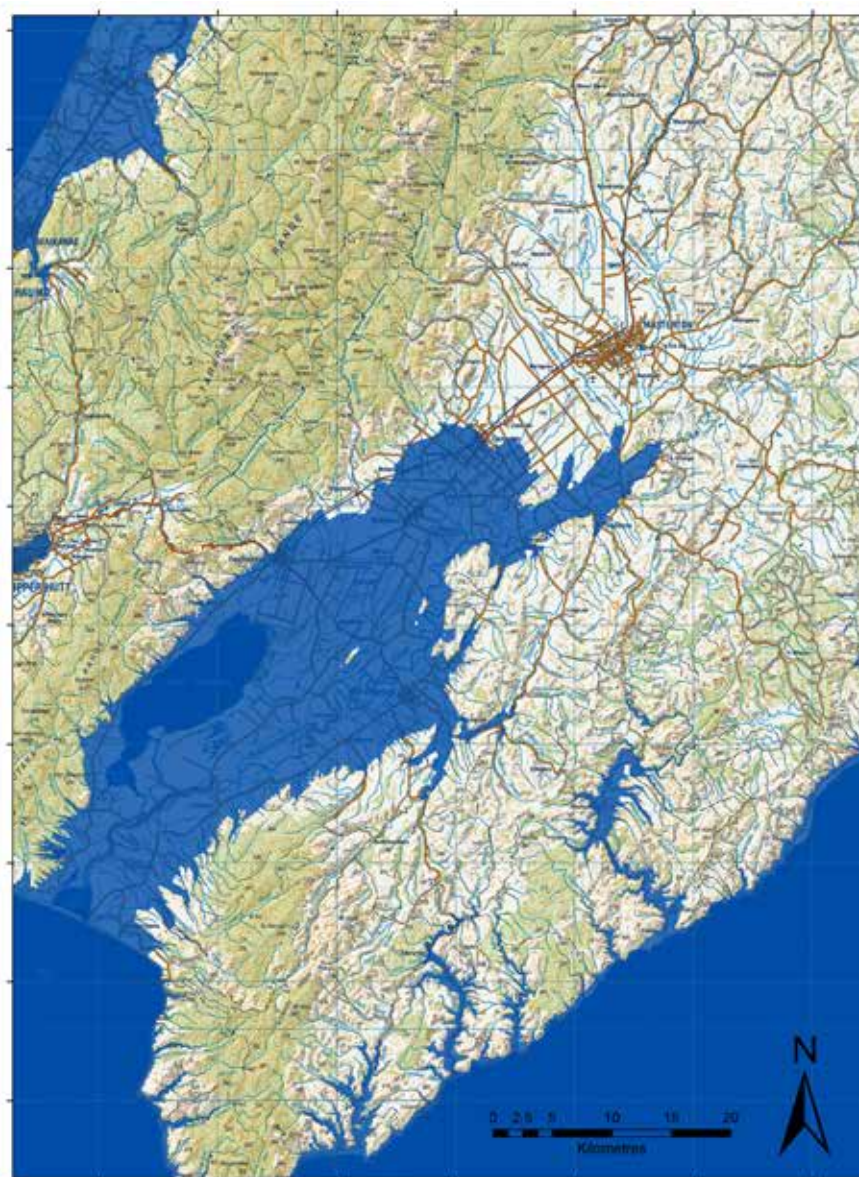
NZ Wairarapa - Rising Sea Level
- 10m sea level rise; potential result of rapid ice sheet collapse

Drawn by Jonathan Musther - 2015
Credit to Land Information New Zealand for NZ Digital
Elevation Model, Topo250 maps and Topo50 map data



NZ Wairarapa - Rising Sea Level
- 25m sea level rise; result of partial ice sheet collapse and melting

Drawn by Jonathan Musther - 2015
Credit to Land Information New Zealand for NZ Digital
Elevation Model, 30m/250 maps and Topo50 map data



NZ Wairarapa - Rising Sea Level
- 80m sea level rise as a result of glacial and polar ice melt

Drawn by Jonathan Musther - 2015
Credit to Land Information New Zealand for NZ Digital
Elevation Model, Topo250 maps and Topo50 map data

APPENDIX B - HABITATS

- Long fin eels (*Anguilla Dieffenbachii*)
 - Endemic to New Zealand and is classed as declining by DOC
 - Can live in variety of habitats but prefers clean, cold water environments
 - Is catadromous, adults swim all the way to an area near Tonga for an annual mass spawning. When the larvae hatch they drift back to New Zealand on ocean currents
 - Longfin eels only breed once, at the end of their lives and can grow very old
 - Largest on record 20kg, 2 meter long
 - Elvers (young eels) swim up river and can climb waterfalls and even dams by leaving the water and wriggling over damp areas. It is not unheard of for an eel to climb a waterfall of up to 20 meters
 - Eels eat 'live' food such as insect larvae, worms and water snails. When bigger they feed on fish. Benn known to eat crayfish and small ducklings
 - Threats: humans fishing them, habitat loss, hydrology changes, pollution from run off, sewage and effluent
 - Found further up stream
- Giant Kokopu (*Galaxias Argenteus*)
 - Endemic to new Zealand and classed as declining by DOC
 - Grow up to half a meter in length, weighs over 2kilos
 - Is amphidromous and juveniles are found in 'whitebait' during upstream migration
 - Tend to inhabit slow flowing streams, lakes and wetlands
 - Usually associated with some form of instream cover like overhanging vegetation, undercut banks, logs or debris clusters
 - Eat koura to terrestrial insects such as spiders and cicadas
- Brown Mudfish (*Neochanna Apoda*)
 - Endemic to New Zealand and classed as declining by DOC
 - Grow up to 175mm, but are more often around 100mm
 - Non-migratory and completes its entire life cycle in freshwater
 - True wetland specialist and are rarely found elsewhere
 - Loss of habitat through drainage
 - Have a ability to survive out of water during a drought
 - Mature during the summer estivation period and spawn as soon as their habitat is re-inundated in the autumn
 - Swampy lowland habitats such as wetlands, swamp forests and slow flowing streams and drains

APPENDIX C - ETHICS APPROVAL



Phone 0-4-463 5480
Email susan.corbett@vuw.ac.nz

MEMORANDUM

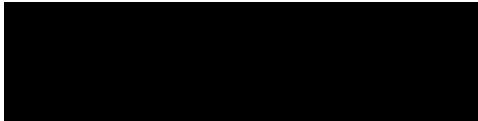
TO	Megan Smart
COPY TO	Bruno Marques
FROM	AProf Susan Corbett, Convener, Human Ethics Committee
DATE	11 June 2015
PAGES	1
SUBJECT	Ethics Approval: 21972 The Land Shaping the People

Thank you for your application for ethical approval, which has now been considered by the Standing Committee of the Human Ethics Committee.

Your application has been approved from the above date and this approval continues until 12 February 2016. If your data collection is not completed by this date you should apply to the Human Ethics Committee for an extension to this approval.

Best wishes with the research.

Kind regards



Susan Corbett
Convener, Victoria University Human Ethics Committee