Preface

A concern for the future of New Zealand wildlife and the earth’s environment was my motivation for this explanatory document. Born with tui, kereru and sheep as my backyard neighbours, my childhood had an intrinsic connection with wildlife. A deeper interest in these wonderful creatures and their habitat was sparked when my mum took me to Motutapu on one of their planting days. I was only eight years old. I became vegetarian, David Attenborough became my idol, and what was an initial curiosity about animals became a concern for their survival.

When deciding on the topic for my thesis it became apparent that I could weave my two passions, architecture and the environment, and try and produce something truly meaningful.

Production of this document has broadened my knowledge of New Zealand’s wildlife environment, and our effect on it. Although I am left more cynical than cheerful about our behavior, it has spurred a personal urgency to conserve New Zealand’s most precious flora and fauna.
Sound of Silence

An Architectural Research Project exploring the urgent need to protect New Zealand endangered wildlife.

Master Thesis Explanatory Document
with supervision from:
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A Research Project submitted in partial fulfilment of the requirements for the degree of Master of Architecture.

Unitec Institute of Technology New Zealand, 2016
Hannah Smith 1362596

Many people assisted in the development of this research project for which I am sincerely grateful. Firstly thank you to my supervisor Min Hall for the endless knowledge, guidance and support you have given me these past fifteen months. This document wouldn’t be where it is today if it weren’t for your valuable opinion. Thank you Mary Flaws, trustee of Motutapu Restoration Trust, for taking interest in this project and providing helpful information on Motuapu Island. Thank you Alan Drayton, from BioBuild for sharing your knowledge of all things earth related, your generosity is boundless.

To my mum and dad, for supporting me over these last five years. You two have always been there to help, no matter what state I was in.

Thank you to my friends from Unitec for the countless discussions and your interest in my project. Jeffrey Patterson- I am sorry we didn’t complete this milestone together, but I am thankful you were a part of it, not easy.

Lastly to the animals this is all for, I hope it does you justice.
If the iconic kiwi species became extinct would the nation mourn its loss?
The effects of climate change, increasing populations, and expanding urban landscapes has contributed to the degeneration of our diverse and fragile ecologies with which New Zealand’s identity is built on. With much of the remaining endangered fauna confined to offshore islands, the role that ecological conservation serves is becoming increasingly vital for the survival of these endemic species. Failure to do so and the title ‘kiwi’ New Zealanders call themselves could be named after an extinct species killed by humanity.

This research project, ‘Sound of Silence’, addresses a limitation in current thinking about the environment within the human race. Using architecture as a mechanism to expand public ecological literacy, by providing an educated sensory experience that informs an emotional connection with wildlife, and therefore a desire to protect. The research undergone will explore the possibility of integrating a structure into the Motutapu Island landscape, which through both its architecture and programme, will play an active role in the restoration of the islands ecologies.
Definitions of unfamiliar words in this project:

**Anthropocene**: Relating to the current geological time, viewed as the period during which humanity began to have a significant impact on climate and the environment.

**Anthropocentric**: Regarding humankind as the central or most significant species on the planet.

**Biocentrism**: The view or belief that the rights and needs of humans are not more important than those of other living things.

**Biomimicry**: The design and production of materials, structures and systems that are modelled/mimicked on biological entities and processes.

**Biophilia**: Human beings have a genetically determined affinity with the natural world.

**Egocentric**: Concerned with the individual, without regard for society.

**Habitat**: The natural environment of an organism.

**Ornithologist**: A scientist who studies ornithology - branch of science devoted to birds.

**Species**: A group of living organisms consisting of similar individuals capable of interbreeding.

**Speciation**: The assumption of human superiority leading to the exploitation of animals.

**Synanthrope**: A wild organism, such as a pigeon, that lives in close association with people and benefits from their surroundings and activities.

**Endemic**: A plant or animal species that are unique to a specific geographic region or location, and no where else in the world.

**Native**: A species presence in a given region, is the result of natural process only, with no human intervention. It can be in more than one region.

**Introduced**: A species living outside its native distributional range, which has arrived there by human activity, either deliberate or accidental.
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Figure 1: NZ Dotterel by artist Bevan Smith.
1.0 Introduction

"Nature holds the key to our aesthetic, intellectual, cognitive and even spiritual satisfaction."
– Edward O. Wilson

Figure 2: Yellow crested penguin
1.1. Research Question.

How can an architectural proposition enhance and promote ecological conservation, while facilitating an educated interaction between wildlife and humans?

1.2. Project Outline.

This project addresses a limitation in current thinking about the environment within the human race. Existing flora and fauna play a fundamental role in society in terms of biodiversity, without which humans as a race would no longer survive. As the effects of climate change and the rapid increase in global population continue to rise, initiatives aimed at the restoration and conservation of native ecologies are becoming increasingly important.

This project is an exploration, analysis and evaluation of architecture in the development of new approaches to ecological conservation and the extent to which it can facilitate public engagement.

Infrastructural developments servicing the increasing demands of human populations often result in the destruction of fragile ecosystems necessary for diversity of life. A fundamental aspect of this problem is lack of public ecological literacy; with 72 percent of the population living in urban environments, many people are not afforded the opportunity to experience their local, unique and endangered wildlife.

This lack of ‘ecological literacy’ was illustrated by the recent pukeko controlled cull on Motutapu Island, which ended with the death of four of our remaining 306 takahe. Volunteers from Deer Stalkers Association shot the critically endangered takahe while carrying out a cull of six hundred pukeko. This accidental shooting, the result of mistaken identity, is evidence that guidelines and proper education of New Zealand’s endemic fauna are not in place.

In order to ensure a future for New Zealand’s natural environment, people must amend the relationship they have to it by improving ecological literacy. This project looks at how architecture can assimilate ecological conservation and direct publicly educated interaction in the built form. Explicitly, this research project seeks to explore mechanisms to integrate a structure into the Motutapu Island landscape, which both through its architecture and programme, will play an active role in the restoration and of the island’s ecologies.


1.3. Aims and Objectives

The focus of this project is to produce a sustainable responsive design solution that raises awareness on New Zealand wildlife. This can be achieved by engaging the public on how New Zealand’s landscape has changed as a result of human interventions and what needs to be done in order to redress the balance. The design must be sensitive to the ecologies and conditions of the site. The challenge is to not destroy the very ecology we are trying to protect. If the architectural intention fails to engage people appropriately, the wildlife it is trying to enhance will too be forgotten and therefore be at threat.

The following goals to achieve this are:

• Raise awareness on ecological conservation through interactive learning by using architectural techniques as a means to entice senses.
• Assimilate ecological conservation into architectural built-form.
• Provide educational programmes on the importance of biodiversity to encourage stronger relationships between humans and wildlife.
• Integrate the design into the sites landscape.
• Investigate the use of sustainable design, such as self-sufficiency in conjunction with local materials, for minimal impact on the immediate context and the environment.

Preserving New Zealand’s unique wildlife is a key driver. The design should incorporate all of these aims, with the intention to be used as a model for further steps towards a thriving biodiversity.

This project presents an opportunity to discover an acceptable way of designing for the protection of our wildlife, by provisioning the public the opportunity to experience our wildlife in an intimate manner. In a generation where human population is rapidly changing the earth’s environment, New Zealand faces the threat of losing its unique wildlife if our disregard towards other species continues.

Locating the site in the Auckland region, a city with the most condensed population in the country, maximises the number of people exposed to the natural world, particularly the uninformed.

The reasons for protecting New Zealand’s endangered flora and fauna from otherwise certain extinction must be specified. What makes their life worth living; what makes their lives less valuable than ours? Is there a part of us where environmental connection is essential in our lives, or do we only agree to have wealth and pleasure? These philosophical dilemmas will be researched over the period of the project.
1.4. Methodology.

The project evaluates the research problem through the refinement of alternative solutions throughout the design process.

This research project was undertaken through the following two frameworks: research ‘for design’, and research ‘by design’.

The research for design phase included a critical analysis of literature and precedents based on New Zealand’s natural environment. Whilst this is an area of longstanding personal interest, an increased level of understanding was fundamental to the success of the project. Quantitative methodologies were used to establish areas of relevant conservation information. These include factors for declining biodiversity, the current state of New Zealand’s natural environment, the effect Maori and European settlement had on flora and fauna, the value of biodiversity, and general ecological research. Most of this material was sourced from Department of Conservation reports and corresponding published studies, including local and international websites, as well as information from local rangers. Discussions held with fellow students, supervisors, conservation workers, tourism campaigners and architects was frequent across the programme.

The innate affiliation humans have with nature, defined as biophilia, became the foundation for which public would obtain an emotion connection with nature. Using architecture as a mechanism to engage with the senses and inform public on the realities of New Zealand’s wildlife.

Four precedents, three situated in New Zealand and one in Berlin were analysed in accordance with Francis Ching’s study on circulation and the techniques used to engage the senses. This enabled the opportunity to take note from both positive and negative aspects in relation to this research project.

A section of international and local artists were also investigated and located in corresponding zones throughout the museum, strengthening the sensory experience to enhancing ecological awareness.

A successful architectural response is reliant on a thorough understanding of the site. Following the selection of the suitable site for this study, a site analysis was conducted on the initial visits. Due to the island’s vast and significant history, an understanding of its participation throughout early Maori and European settlement up until the present was not only fascinating but highly influential when it came to the design process.

This led to research ‘by design’. The approach was to design with the state of knowledge at hand, whilst drawing upon immediate contextual feedback, such as location, heritage of the site and ecological qualities, which would amalgamate with the design intent. A cyclic process of research and design was constant in the project.

The project was critiqued throughout the period by supervisors and accompanying guests, providing regular opportunities for reflection, often leading further exploration, reassessment or evaluation of different alternatives. Conclusively, this led to a responsive architectural design in contribution to an increased understanding of New Zealand’s unique wildlife.
2.0 Background

Figure 7: Tui perching on flax flowers

"The greatest threat to our planet is the belief that someone else will save it."
- Robert Swan
THE CREATION OF AOTEARIOA

"Legend has it that New Zealand was fished from the sea. Maui was a demi-god, who lived in Hawaiiki. He possessed magic powers that not all of his family knew about. One day when he was very young, he hid in the bottom of his brothers’ boat in order to go out fishing with them. Once out at sea, Maui was discovered by his brothers, but they were not able to take him back to shore as Maui made use of his magic powers, making the shoreline seem much further away than it was in reality.

So the brothers continued rowing, and once they were far out into the ocean Maui dropped his magic fishhook over the side of the waka. After a while he felt a strong tug on the line. This seemed to be too strong a tug to be any ordinary fish, so Maui called to his brothers for assistance.

After much struggling, up suddenly surfaced Te Ika a Maui (the fish of Maui), known today as the North Island of New Zealand. Maui told his brothers that the Gods might be angry about this, and he asked his brothers to wait while he went to make peace with the Gods.

However, once Maui had gone his brothers began to argue among themselves about the possession of this new land. They took out their weapons and started pounding away at the catch. The blows on the land created the many mountains and valleys of the North Island today. The South Island is known as Te Waka a Maui (the waka of Maui). Stewart Island, which lies at the very bottom of New Zealand, is known as Te Punga a Maui (Maui’s anchor), as it was the anchor holding Maui’s waka as he pulled in the giant fish."
The lighthouse keeper’s cat, The story of New Zealand’s natural history in miniature. The archipelago of islands which make up New Zealand was once filled with fantastic birds. Unfortunately the current rate of extinction is between one hundred and one thousand times faster than the average background rate, which was around ten to twenty-five species per year worldwide. [90]

Extinct Birds of New Zealand (Wellington, N.Z: Te Papa Press, 2006), 1. Extinct. Besides Tennyson, Alan J. D and Paul Martinson. New Zealand Threat Classification System Category’, in the appendix for criteria on threat rankings. 7 Refer to ‘New Zealand Threat Classification System Category’ in the appendix for criteria on threat rankings. 6 Morris, Rod, and Hal Smith. Wild South: Saving New Zealand’s Endangered World. Auckland: T175262 Association with Century Hutchinson, 1988. pg7. [127x171]The lighthouse keeper’s cat, The story of New Zealand’s natural history in miniature. The archipelago of islands which make up New Zealand was once filled with fantastic birds. Unfortunately the current rate of extinction is between one hundred and one thousand times faster than the average background rate, which was around ten to twenty-five species per year worldwide. [90]


The story, “the lighthouse keeper’s cat” is the story of New Zealand’s natural history in miniature. The archipelago of islands which make up New Zealand was once filled with fantastic birds. Unfortunately the current rate of extinction is between one hundred and one thousand times faster than the average background rate, which was around ten to twenty-five species per year worldwide. [90]


The last word in ignorance is the man who says of an animal or plant “What good is it? - Aldo Leopold, Round River, 1953

“On a small New Zealand Island there once lived a species of tiny wren. For many years no one knew of the existence of the small, secretive birds until a lighthouse was built on the island in 1894 and a lighthouse keeper went to live there. He took his pet cat to keep him company. While the lighthouse keeper worked in the lighthouse the cat explored the new island. Within days the cat discovered the wrens. When the lighthouse keeper himself saw the first of the birds it was already dead. His cat had brought it back to the lighthouse. Several nights later the lighthouse keeper saw three of the birds running like mice among the rocks in search for food, as he took his evening walk. They puzzled him and so he sent the body of the dead wren to a scientist in Wellington. Later the tiny bird was sent to London. It appeared to be one of the most ancient birds living in New Zealand, and was perhaps the smallest bird of all the world. Back on the island, the lighthouse keeper continued to find more dead wrens. Each killed by the cat. When ornithologists at last arrived on the island to learn more about the wren and how it lived, it was too late. No more were ever found. Only the cat knew how many wrens once lived on the island. [60]

Extinction.

Resources to Support the World’s Population. “ http://www.abc.net.au/radionational/programs/ockhamsrazor/ Figure 8: Extinction of Huia, by Samantha Lane

Extinction is the most acute, irreversible effect of our unsustainable human population. Unfortunately, our apprehension of a sustainable ecological footprint, our notion of what a world worth living in is, presumes that humans will allow for enough room and resources for all species to live contently. That in fact we have reached a stage where the amount of resources required to sustain our own population exceeds what is available. [90]

Our ignorance, or rather feigned ignorance about the environment we live in has put into play ecological pressure on the world’s flora and fauna, pressure that only leads to further extinctions. Discussions of human-caused extinction sometimes defaults to the position that the process is natural, and thereby acceptable. However, it is estimated that the current rate of extinction is between one hundred and one thousand times faster than the average background rate, which was around ten to twenty-five species per year worldwide. [90]

Ecologist Jared Diamond considers that because New Zealand began with the most interesting flora and fauna of any island, the extinctions have been the worst tragedy to befall the world’s biotas. [10] The speed at which New Zealand’s bird extinctions have taken place is remarkable. In less than one hundred years since first human contact, see Figure 9 for a chronological graph of the mass extinctions. [10] Ninety-two percent of New Zealand’s bird species in the New Zealand ecological region have become extinct in less than eight hundred years since first humans arrived. The last word in ignorance is the man who says of an animal or plant “What good is it? - Aldo Leopold, Round River, 1953

Unfortunately the most distinctive and ancient birds have suffered the greatest impact; 41 percent of endemic birds are gone forever! [12] Surviving species now occupy only small fragments of their former ranges, many only an ecological heartbeat from joining the ranks of the lost. Limplopping, slow breeding rate, small-dishy успех, lang and inability to fly are all characteristics that contribute to many endemic birds’ disappearances. However there are some characteristics are also their biggest downfall and have lead to their extinction or fatal decline. It is too late for the lost birds mentioned, but it is not for the living; if humanity apply lessons learned to help stop further extinctions. The excess that our indulge flora and fauna has become a problem, that we could not remedy the ecological consequences of our actions, such as predator introductions, no longer suffice. Acceptance that we are responsible for tremendous ecological damage is needed, and should lead to a desire to protect what is left and rebuild, where possible, that which has been lost. [124]
Extinction of Endemic Bird Species

1. North Island Stout-legged wren, South Island Stout-legged wren (1200s)
2. Snipe rail, (around 1300s)
3. Little Bush wren, North Island giant moa, South Island giant moa, Eastern moso, Upland moso, Stout-legged moso, Crowed moso, Heavy-footed moso, Island moso, North and South Island goose, anhinga, Waiatah pigeon, Haast’s eagle (1400s) - in total
4. New Zealand stiff-tailed duck, New Zealand musk duck, North Island cost, Chatham Island kites, Chatham Island merganser (1500)
5. Eridne duck (late 1400s-mid 1600s)
6. Chatham Island cost, Chatham Island rails (1750-1791)
7. North Island raven, South Island raven, Scarlett’s duck (1600s)
8. Scarlett’s shearwater (1566-1858)
9. Hodgens’ waterhen and Chatham Islands duck (1700s)
10. Forbes’ (Eyles) harrier (1777)
11. Hawkins’ rail (early 1800)
12. Dieffenbach’s rail (1840)
13. Forbes’ snipe, New Zealand owlet-nightjar (1800s)
14. New Zealand kaka, Chatham Island merganser (1400s)
15. Chatham Islands kaka, Long Island brown (1802), Chatham Island rail (1903), North Island tuatara/Moko (1840s), New Zealand little bittern (1860s), Eurylins (1895)
16. New Zealand merganser (1862), North Island prepuce (1802), South Island prepuce (1800), Chatham Islands bellbird (1800)
17. South Island laughing owl, North Island laughing owl (1814)
18. Huia (1887, declared extinct in the mid 1820s)
19. South Island snipe (1894), Limbot’s potol (1876)
20. Shipwrecked bird, North Island bush wren, South Island bush wren (1872),
21. South Island kokako (1997, possibly recent sightings)

Predator Arrivals to New Zealand

1. Polynesians, Pacific rats and dogs arrive on NZ mainland (late 1200s)
2. Polynesians, Pacific rats and dogs arrive on Chatham Islands (1300)
3. Swampy harrier arrives in NZ (late 1200s-1769)
4. Europeans sight NZ (1642)*
5. Europeans arrive to mainland (1769)
6. Norway rats arrive to mainland (1770-1773), Pigs arrive to mainland (1773)
7. Europeans arrive on Chatham Islands (1781)
8. Pigs settle on Chatham Islands (1829), with cats arriving later (1815)
9. Norway rats and dogs present on Chatham Islands (1835), cats on the mainland (1835)
10. Pumice settlement on mainland (1808)
11. Ship rats arrive on the North Island (1836-1861)
12. Ferrets arrive on mainland (1879)
13. Stoats and weasels arrive on mainland (1885), Ship rats – South Island (1846s)
14. Ship rats arrive on Chatham Islands (1890)

*British explorer James Cook arrived in Poverty Bay In October 1769.
Figure 10: Diagram of the status of New Zealand birds. Information obtained from DOC’s ‘Criteria for New Zealand’s Threat Ranking’.

Figure 11: Sketch of male and female huia by Walter Buller.
There have been five mass extinctions since life began on earth. The worst, the Permian extinction, occurred about 245 million years ago when some 90 percent of earth’s species perished. While nature has recovered from these mass extinctions, it took millions of years to do so.12 It has long been accepted that the adverse effects of our way of life have impacted upon every inch of our planet’s surface. Certainly no place in this country is left unaffected by human intervention to some degree. The impact of overpopulation and shrinking of natural resources has contributed to the degradation and destruction of our diverse, unique and all too fragile ecologies. As such we are living in an age that is shaped by our own physical impact on the natural world in which we live – the Anthropocene Age; an age all about one species, homo sapiens, with the rest of life rendered subsidiary. E.O. Wilson prefers to call the Eremocene Age, “the age of loneliness”.13

Human population growth and overexploitation of resources are at the root of our most pressing environmental issues. Unlike other mass extinctions where natural events were at fault, the blame for the coming sixth great extinction will lie directly with humans. Accepting this reality is critical, the future success of conservation depends on all our energy and inventiveness to save further species from an irreversible fate.

Cities and urban populations are expanding at a rapid rate, with ecologically sensitive areas increasingly at risk of becoming fragmented to a level where they cease to function. The human population totaled one billion in 1800 and climbed to two billion in 1930; four billion forty-five years later, and today it is over seven billion.14 We are adding 227,000 more everyday; at this rate it is only a matter of time before earth’s capacity reaches its limit. There is no way we can continue to draw upon the resources of the planet to such a degree without drastically reducing the state of most other species.

David Attenborough states, “people are not going to care about animal conservation unless they think that animals are worthwhile.” This project is about addressing this problem; to give people a reason, a cause to protect.
Do animals merit our concern? The argument for extending the principle of equality to animals, but deny them a full moral status, is an ongoing discussion. Philosophical thinking on a moral standing towards animals can be classified into three categories: Direct theories, indirect but equal theories, and moral equality theories.  

Direct theories deny animals moral status or equal consideration with humans due to a lack of consciousness, reason, or autonomy.[16] Indirect theory may still require not harming animals, but only because to do so causes harm to humans' morality. Philosophers such as Immanuel Kant and Rene Descartes have formulated such indirect arguments. One of the earliest and most explanatory expressions of this view comes from Greek philosopher Aristotle (384-322 BC). He held the view that the natural world is a hierarchy in which those with less reason exist in the interest of those with more rationale. They are capable of conscious experience. Therefore plants, he said, exist for the sake of animals, and animals for the sake of man.[17]

Moreover, there are several well-established categories of theories towards animals can be classified into. These categories: Direct theories, indirect but equal theories, and moral equality theories.

Indirect theories deny animals moral status or equal consideration with humans due to a lack of consciousness, reason, or autonomy.[16] Indirect theory may still require not harming animals, but only because to do so causes harm to humans' morality. Philosophers such as Immanuel Kant and Rene Descartes have formulated such indirect arguments. One of the earliest and most explanatory expressions of this view comes from Greek philosopher Aristotle (384-322 BC). He held the view that the natural world is a hierarchy in which those with less reason exist in the interest of those with more rationale. They are capable of conscious experience. Therefore plants, he said, exist for the sake of animals, and animals for the sake of man.[17]

Direct but unequal theories accord some moral consideration to animals, but deny them a full moral status due to their inability to respect another's rights.[18] However where the interests of animals and humans conflict, the properties of both, such as rationality, award higher consideration to human beings.  

Moral equality theories embrace the theory that all species, both biocentric, is an ethical belief that the rights and needs of humans are not more important than those of other living things.[19] Arguing on the grounds that they have similar physiological and mental capacities as infants, this term stands in contrast to anthropocentrism, which centres on humans being the most significant species on the planet. Biocentric ethics encourages the rethinking of the relationship between humans and nature. It states that nature does not exist simply to be used or consumed by humans, but that humans are simply one species amongst many.[20] That being said, because we are part of a wider ecosystem, any actions which negatively affect living systems negatively affect us as well.[21] Advocates of biocentrism often promote conservation of biodiversity, animal rights, and environmental protection. Philosophers like Peter Singer have represented arguments in this category. In his book 'Animal Liberation', Singer states that the underlying principle of equality does not require any or identical treatment; it requires equal consideration.[22] This is an important distinction when discussing animal conservation in New Zealand. Singer explains that all animals hold the ability to suffer in the same way and same degree that humans do. They feel pain, fear, fear, loneliness, and motherly love.[23] Hence, we are involved in something that would interfere with their needs, we are morally obligated to take them into account.

Animals will never gain the moral rights they deserve if people continue to operate within the parameters of the indirect view. To be a human race is not the pinnacle of all species, but rather it is the middle of nature. Dwell among not above. This project will focus toward the goal of biocentrism, as opposed to anthropocentrism, beginning with amending the principles on which our incompetence is strong, like the instrumental effect seemingly innocuous acts has on our surrounding wildlife. For example, the innocent decision the lighthouse keeper made in bringing his pet cat, single handedly wiped out a whole species.
2.3. Conservation in New Zealand.

“Conservation is a state of harmony between men and land. By land is meant all of the things on, over, or in the earth. Harmony with land is like harmony with a friend; you cannot cherish his right hand and chop off his left. That is to say, you cannot love game and hate predators; you cannot conserve the waters and freshet them in every way short of death, or destroy them to benefit the forest and mine the farm. The land is one organism, and you cannot regulate the one without the other; and do not abolish them.”[25] An excerpt on the definition of conservation, attributed to Sir Walter Buller (1892-1979) at the age of 70, during his tenure at Otago University Press, 2011, 11.

Agriculture remained untouched, such as the Kākāpō, for reason being it infected sheep when it ate their food. The development of the kākāpō was preventable if he was to preserve rather than destroy. In one of Buller’s descriptions he described the beauty of the Huia, which he later casually shoots, in a time when awareness of the birds scarcity was high.

During the whole expedition we only saw one Huia, which I shot.”[26] So it is no surprise, given our idiocy, that the last surviving Huia was enslaved at London zoo. Two males—not one Huia—were enslaved at London zoo. Two males—not one Huia—were enslaved at London zoo.

In 1903 the Scenery Preservation Act was passed. 29 Areas of bush were protected. It was also during this time that settlers began to represent themselves as Kiwis.

In 1905 the Sunvers Conservation Act was passed. 30 Areas of bush were further protected. These efforts were needed if endemic wildlife is to have a prosperous future. Today, such advances lead to a false sense of overconfidence and no obvious need for it, people are more disconnected from nature than ever. Necessity for ‘more’ has created a culture which seeks all the benefits and beauty nature provides with no reciprocal respect.

On the 25th of July 2016 the government announced an ambitious goal, to make New Zealand completely predator free by 2050;[30] not one Huia, no predators, no threats to wildlife. The 28 million dollar injection into pest control will be the foundation to reducing the 25 million native birds that are killed by pests each year.[31] It is an ambitious proposal, but one that will boost public awareness of the factors that make our environment, so wondrous, such an important part of New Zealand’s psyche, and the possibilities it offers individually and collectively.

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Conservation is a state of harmony between men and land. By land is meant all of the things on, over, or in the earth. Harmony with land is like harmony with a friend; you cannot cherish his right hand and chop off his left. That is to say, you cannot love game and hate predators; you cannot conserve the waters and freshet them in every way short of death, or destroy them to benefit the forest and mine the farm. The land is one organism, and you cannot regulate the one without the other; and do not abolish them.”[25] An excerpt on the definition of conservation, attributed to Sir Walter Buller (1892-1979) at the age of 70, during his tenure at Otago University Press, 2011, 11.

Agriculture remained untouched, such as the Kākāpō, for reason being it infected sheep when it ate their food. The development of the kākāpō was preventable if he was to preserve rather than destroy. In one of Buller’s descriptions he described the beauty of the Huia, which he later casually shoots, in a time when awareness of the birds scarcity was high.

During the whole expedition we only saw one Huia, which I shot.”[26] So it is no surprise, given our idiocy, that the last surviving Huia was enslaved at London zoo. Two males—not one Huia—were enslaved at London zoo. Two males—not one Huia—were enslaved at London zoo.

In 1903 the Scenery Preservation Act was passed. 29 Areas of bush were protected. It was also during this time that settlers began to represent themselves as Kiwis.

In 1905 the Sunvers Conservation Act was passed. 30 Areas of bush were further protected. These efforts were needed if endemic wildlife is to have a prosperous future. Today, such advances lead to a false sense of overconfidence and no obvious need for it, people are more disconnected from nature than ever. Necessity for ‘more’ has created a culture which seeks all the benefits and beauty nature provides with no reciprocal respect.

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Biodiversity is our most valuable, but least appreciated asset. The loss and degradation of indigenous biodiversity is the most pressing issue facing our world and our species, and the uncontrolled growth of human populations and our use for development removes habitats for our endemic biota, and this privilege brings with it the responsibility to protect what has not yet vanished. In the hands of New Zealanders. Anything lost is lost to the world.

New Zealand has the longest stretch of coastline in the world. The increasing mass of international tourists expect the ‘100% PURE’ image portrayed to be justified by reality. Conservation contributes to the nation’s identity as a place of untameable rivers, and endless expanses of ranges, lush forests filled with unique wildlife, and unassuming sponge produces cancer-fighting medicines are derived from plant extracts, of which we promote New Zealand as a thriving ecology provides ‘ecosystem services’ that should be worrying about the extinction of the coot or the tree creeper. To put it simply, there is no choice. Without conservation, the loss and degradation of our endemic biota, and this privilege brings with it the responsibility to protect what has not yet vanished. In the hands of New Zealanders. Anything lost is lost to the world.

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Is there an emotional bond between human beings and the natural environment out of which we evolve? Why is it that we favour living prominently near water or by parkland, and call a landscape beautiful for reasons we can’t express in words? Given the means a large portion of the population choose leisure by camping, fishing, hiking, gardening, visiting zoos, or swimming at the beach. We crowd national parks, and travel long distances if it means a trip to a natural hot spot. American biologist E.O. Wilson suggests that humans possess a capacity to seek connections with nature. This innate emotional affiliation of human beings to living organisms he calls “biophilla.”

Māori world-view is not dissimilar to biophilla, the very title ‘tangata whenua’ meaning people of the land highlights the pre-eminent importance of the environment to Māori identity. The Māori view is that people are all intrinsically linked with the natural world; their wellbeing linked to the health of the environment. Māori believe they have a special role and responsibility as kaitiaki (guardian) for our biodiversity. This is important to understand and consider as the Māori world-view is an essential step towards a bi-cultural approach to biodiversity management.

So why this affinity to imagine ourselves as external to this country’s indigenous nature? The fact that 72 percent of New Zealand’s now live in the sixteen main urban areas means that we are living remote from nature, and we cannot value what we do not see. ‘Out of sight, out of mind’ is a standard expression that sums up the general attitude many humans have towards the natural environment. Although we desire to be in immediate contact in a physical sense, to relish enjoyment from the environment, when it comes to considering the effects each of us have individually and collectively, it is easier and more convenient to put it out of sight, and therefore out of mind.

Children and nature, two words that are meeting less. Typically when defining childhood, one would describe it as endless explorations and opportunities for adventure. Unfortunately a new generation is being raised in New Zealand, and world wide; a generation that is being brought up without the appreciation and understanding about the relationship of our built societies to its natural surroundings. Today, children are exposed to technology prematurely, given little opportunity to be immersed with their environment. Yet when given the opportunity to explore their habitat children are fascinated with the natural world, seeing it not just as a backdrop, but something to be interacted with. They want to touch, dig, pulp, shake, pound, pour, smell, taste, and “muck around”1. Consequently, educating children on New Zealand’s environment is the best hope for raising awareness of why and how one can preserve and protect the earth and the future of humanity.

People are so encapsulated in a material world that they often have no perception of what the effects of their consumer driven lives are having on surrounding wildlife. Re-establishing this relationship becomes a major driver of this project, as it aims to not only to connect physically, but mentally with the public. To provoke a sensory impact through architecture, which alters one’s attitude towards wildlife. The impact must be significant enough that the experience is so deep it cannot be forgotten. Biophillia, the innate propensity to be one with nature, will be explored and conceptualised in the design process as a way of educating people through complete immersion and encouraging them to reconnect with their natural surroundings.

43 Brake and Peart. Treasuring Our Biodiversity, 140,141.
44 Ibid
45 Abbot and Reeve, Wildheart, 128.

Figure 17: Juvenile takahe
Before the design process can begin an understanding of how to provoke the desired sensory impact, through architecture, and how they are elicited is necessary.

The way humans perceive a space is through its senses. The five senses being; sight, sound, smell, touch and taste. Humans process of thinking and their perception is dependent towards the sense of sight. An experience is typically described with reference to our eye. We describe how it looks, rather than how it feels, smells or sounds. This is true for architecture too. People largely generate, how it feels, smells or sounds. This is typically described with reference to our five senses. In his book ‘Thinking Architecture’ Zumthor writes, “The strength of a good design lies in ourselves and in our ability to perceive the world with both emotion and reason. There is the potential to experience past events, or elicit direct educated experience. There is the potential to experience past events, or elicit direct educated experience. There is the potential to experience past events, or elicit direct educated experience. There is the potential to experience past events, or elicit direct educated experience.

His works revolve around the relationship between the human body and its environment. He is heavily influenced on how an object feels, smells, resonates and sounds, and what kind of impressions, mental recollections, and expectancies they elicit. Specifically, his minimalist designs show an interest in the mood and atmosphere of an object or space and use material and details that appeal to all senses. In 2006 Zumthor published ‘Atmospheres’, containing his lecture in which he tries to explain the differing atmospheres that are elicited by the building itself, or a result of people’s interaction with the space. An interpretation of how the light falls, where shadows are formed, and how material reflects light. A change in volume can define a space, set the boundaries, and understanding one’s world through the entire body and not just through the hands. Some textures have the ability to stimulate the human senses without being physically touched, for example, the rough shadows created by the texture of stones gives a sense of solitude and connection with the earth. A variety of materials demonstrate not only a textural difference but also a temperature difference, the difference between the coolness of steel and the warmth of wood radiates a sense of warmth. The nine elements present in consideration for this research project, the nine elements present in consideration for this research project, the nine elements present in consideration for this research project, the nine elements present in consideration for this research project, the nine elements present in consideration for this research project.

1. Body of Architecture

Materiality; the concept of architecture as a human environment.

2. Material Compatibility

A building should not be designed solely on pleasing the eye, rather serve to delight the totality of the body. Todays technological advancements has assisted in separating the senses even further, assisting in the composition with other materials and its craftsmanship, how it is used, in terms of its craftsmanship, how it is used, in terms of its craftsmanship, how it is used, in terms of its craftsmanship. Materiality; the concept of architecture as a human environment.

3. The Sound of Space

The live reflections of echo and re-echo within a stone cathedral increases our awareness of the vastness, geometry and material of its space. The noise in a space would be completely different with carpet. Typically buildings are built to reduce, or isolate sound, however, Zumthor’s strategy suggests behavour, stating spaces incorporating acoustics have the potential to act as an instrument, enhancing a multi-sensory experience.

4. The Temperature of Space

It incorporates not only the typical experience of physically touching an item but is also applicable in the teaching of spatial volumes talk to each other. The application of sound can be augmented through differences in texture, volume and material. The composition of spaces, allowing for different pitched sounds, reverberation or sound absorption. This element is influential for this research project, the differing spaces can manifest the calming effect of animal called birds, creating a distinctive sonic profile, and in navigation through the movement of ones footsteps as one approaches uncertainty. The distinct sonic difference between the differing acoustics of spaces can enrich the auditory and overall experience of particular spaces, defining a specific intent of the cause in each space.

Steven Holl wrote on the subject of sound, “The live reflections of echo and re-echo within a stone cathedral increases our awareness of the vastness, geometry and material of its space. The noise in a space would be completely different with carpet. Typically buildings are built to reduce, or isolate sound, however, Zumthor’s strategy suggests behavour, stating spaces incorporating acoustics have the potential to act as an instrument, enhancing a multi-sensory experience.

5. Surrounding Objects

Organisation of spaces once the building is complete.

6. Between Composure and Seduction

An opportunity to move the visitor and evoke different emotional responses to experience architecture before we have even heard the word.” In consideration for this research project, the nine elements present an opportunity to move the visitor and evoke different emotional responses to experience architecture before we have even heard the word.” In consideration for this research project, the nine elements present an opportunity to move the visitor and evoke different emotional responses to experience architecture before we have even heard the word.” In consideration for this research project, the nine elements present an opportunity to move the visitor and evoke different emotional responses to experience architecture before we have even heard the word.” In consideration for this research project, the nine elements present an opportunity to move the visitor and evoke different emotional responses to experience architecture before we have even heard the word.” In consideration for this research project, the nine elements present an opportunity to move the visitor and evoke different emotional responses to experience architecture before we have even heard the word.”

7. Tension between Interior and Exterior

The interplay between interior and exterior and the boundaries formed.

8. Levels of Intimacy

Scale, proximity and distance, and volumes are spatial devices that can make one space feel enclosed and humble, while another open and light. It incorporates not only the typical experience of physically touching an item but is also applicable in the teaching of spatial volumes talk to each other. The application of sound can be augmented through differences in texture, volume and material. The composition of spaces, allowing for different pitched sounds, reverberation or sound absorption. This element is influential for this research project, the differing spaces can manifest the calming effect of animal called birds, creating a distinctive sonic profile, and in navigation through the movement of ones footsteps as one approaches uncertainty. The distinct sonic difference between the differing acoustics of spaces can enrich the auditory and overall experience of particular spaces, defining a specific intent of the cause in each space.

40 Zumbro, Peter, Atmospheres, (Basel, Switzerland; Muller Publishers, Switzerland: 1998) p57

49 'Space, ‘Atmosphere in Architecture by Paul de Vries,” (accessed 22.01.17)
In order to present a clear context within which this research project is positioned, four precedents have been selected, each one manifesting a different aspect of architectural design relevant to this project. Taking influence from Francis Ching’s critical analysis of the built form, using visual referencing in his book ‘Architecture, Form, Space and Order’ in chapter five, circulation, has informed the following analyses.

• Arataki Visitor Centre presents an architecture which considers its surrounding ecologies to a higher regard than most. Its primary function is to act as the mediator between its occupants and the environment.

• Longbush Ecosanctuary presents a clear example of design which is concerned with sensitive habitation to the landscape, whilst at the same time addressing occupants experience and engagement with wildlife through various design methods. An educational space on conservation, the form of the shelter is set out in a way that invites interaction and appreciation of nature on a primal level.

• Te Uru uses light and other architectural strategies as a way of stimulating the senses, restricting views, or giving glimpses where appropriate. Each gallery subtly different according to its purpose, while the transition spaces act not only as a circulation zone but provides visual connection to adjacent levels.

• Jewish Museum Berlin is investigated here as it, contrasting to other museums, represents the architecture as a way of expressing the topic at hand, life as a Jew. Manipulation of emotions, feeling of physical isolation, grief and remorse are all architectural techniques displayed by Libeskind.

2.6. Precedent Study

Figure 19: Arataki Visitor Centre
Figure 20: Longbush Ecosanctuary
Figure 21: Te Uru Contemporary Art Gallery
Figure 22: Berlin Jewish Museum
The Arataki Visitors Centre, run by Auckland Council, serves as a gateway to the Waitakere Ranges Regional Park, with tracks, including the Hillary trail, providing access to over 16,000 hectares of native forest and coastline. Arataki is within 30 minutes drive of central Auckland, its close proximity makes it highly accessible for day trips.

Harry Turbott, both architect and landscape architect, had a love for the environment, an affection that often lead to combining the two disciplines in his projects, Arataki being one of them. The visitors centre has a clear relationship with its surrounding environment, both with its immediate connection through boardwalks and expansive decks overlooking the Waitakere Ranges and with the use of wood as the main material. Turbott has incorporated the Māori culture into the design, through striking carvings sculpted by local iwi and the form of the building influenced by the wharenui typology.

Arataki, meaning ‘pathway to learning’, is a name the Visitor Centre lives up to. With an information service, an array of conservation displays throughout the interior, meeting rooms for conservationists, and a stand alone Environmental Education Centre which caters for school programmes, this community building provides people of all ages a better understanding of the natural environment and the part they can play in protecting it.

FORM
Turbott’s incorporation of Māori culture in the design was significant. The gable pitched roof and pou in the forefront are classic typologies of a wharenui. Wharenui, literally meaning ‘big house’, is a meeting house for Māori people. A visitors centre, incorporating a whare typology strengthens the communal conservation intention.

The plan consists of two symmetrical paths with a balanced arrangement of spaces on either side of the axis, divided by rectical columns at regular intervals. These defined zones are then categorised into programmes, information desk, seating, conservation display, childrens area.

CIRCULATION
A frontal approach across the car park leads directly to the front of the visitors centre. Visually the Māori significance is clear, an elaborate twelve metre pou stands tall at the entrance, representing the tangata whenua of the Waitakere Ranges.

The entrance however is not as direct as the approach. What might be considered as the main entrance, a door directly behind the pou actually leads to the toilets. Rather, two ramps, to the left and right, bend amongst the native trees giving glimpses of the Waitakere Ranges before moving towards the pou, this time at a higher level. It is an unorthodox and confusing way of entering a building, however the taste of wildlife visitors receive before entering the building is a deotropic way of subconsciously manipulating people’s movement, and allowing them to appreciate the natural environment first hand before being enclosed in a space for education.
The Welcome Shelter is an environmental education space that promotes community engagement in conservation for the protection of New Zealand wildlife. Located just nine kilometres out of Gisborne on the East Coast of the North Island, Longbush is home to some of the country's most treasured and endangered flora and fauna. Access to the Welcome Shelter is open to all visitors, attracting conservationist, school groups, and general public in increasing numbers.

Sarosh Mulla, together with 88 volunteers, constructed the shelter from sponsored materials, utilising simple construction techniques. The Welcome Shelter is designed to be immersed with nature, with a viewing tower to enable visitors to observe Longbush from a bird's eye perspective. The design is based around a large steel and fabric canopy that provides shelter from the elements for an outdoor classroom setting. Below are three wooden enclosures, each providing a different service, including ablution facilities, storage for teaching material and a workshop for the site ecologist. The workshop unfolds to the exterior by a large drawbridge, creating a level platform to the outdoors on teaching and demonstration days. The design of separate pods forces people to the outdoors as they move between the structures, with the main communal space outside, sheltered by the sculptural roof visually uniting the structures as one.

CIRCULATION

Visitors approach the Welcome Shelter from a distance, prolonging the arrival, catching differing glimpses of the structure through the trees as one gets closer. Upon reaching the shelter, there is no defined entrance, instead the orientation of the clustered forms suggests the entrance is the outdoor space that the buildings overlook.

FORM

The project's programme is evident through its architecture. The organisation of pods clustered around an outdoor congregation area suggests an interactive approach towards conservation education. The floating roof acts as a unifying device, tying the three separate entities together and creating an outdoor classroom. The simple building typology, combined with the use of recycled materials, demonstrates a sensitive approach to the landscape, providing shelter without removing the very qualities of the environment that are the reason for the ecosanctuary's existence.
Te Uru Waitakere Contemporary Gallery was first established in 1986 as Lopdell House Society, in the historic Lopdell House building, which began life as a hotel in 1930. While the original building was attractive, it was never suited to being an exhibition space. In 2002 Mitchell and Stout were commissioned to design an expansion and refurbishment. Twelve years later the gallery was reopened as Te Uru, operating from an award-winning, purpose built building alongside the original Lopdell House.

The name, Te Uru, is derived from ‘Te Hau a Uru’, meaning ‘the wind that blows from the west’.

The gallery has a commanding presence on an angled corner site at the heart of Titirangi and serves as a gateway to the Waitakere ranges and popular west coast beaches.

The destination gallery displays a diverse programme of contemporary exhibitions, events and activities, including art and craft workshops in the Learning Centre, to reflect and strengthen the full diversity of cultural identities, and potential of the community.

Te Uru’s distinguishing feature is its marriage of space and light, and it’s the conversation between these two ethereal qualities that characterises the architecture. Access to each of the five individual galleries extends throughout the six storeys and can be gained via a squashed-oval staircase ascending from the foyer to the left by the main entrance. This mirrors the circular staircase inside the main entrance to Lopdell House, the new thus acknowledging the old.

Each of the five galleries has its own distinctive character as an exhibition space, while retaining coherence throughout.

Many of Zumthor’s nine elements for ambiance are incorporated in Te Uru, such as various ceiling heights, natural light, voids, and sight lines of the Manukau Harbour, creating sensations of tautness and release, compression, vastness and even vertigo in the galleries. Element eight, ‘levels of intimacy’ is portrayed through variation in scale between galleries; spaces with high voids with streams of light, and smaller more compressed spaces, purposively enclosed and intense, provide different atmospheres for exhibitions. Minimalist, but highly detailed design techniques add to the overall experience for the visitor. These subtle techniques include: the slight angle to some walls, giving an exaggerated perspective, the playful cut-out that allows a handrail to transverse an internal wall, and the most notable, the striking suspended lantern in the largest gallery, devised to funnel and diffuse natural light into the gallery space.
The deconstructivist design of the Jewish Museum by architect Daniel Libeskind exhibits the social, political and cultural history of the Jews in Germany from the fourth century to the present. Libeskind, who was born in Lodz, Poland, just a few hundred kilometres from Berlin, and whose entire extended family was killed during the Holocaust, this project was close to him. Conceptually, Libeskind wanted to express the feelings of absence, emptiness, and irreversibility, evident in the Jewish culture at that time. The project brief for the new museum was based on three concepts that formed the museum’s foundation. “First, the impossibility of understanding the history of Berlin without understanding the enormous intellectual, economic and cultural contribution made by the Jewish citizens of Berlin, second, the necessity to integrate physically and spiritually the meaning of the Holocaust into the consciousness and memory of the city of Berlin. Third, that only through the acknowledgment and incorporation of this erasure and void of Jewish life in Berlin, can the history of Berlin and Europe have a human future.” Libeskind addressed this brief by using architecture as a vehicle for narrative and emotion. According to Libeskind the Jewish Museum, or as he calls it, ‘Between The Lines’, is a project between two main lines of thinking: “One is a straight line but broken into many fragments, the other is a tortuous line but continuing indefinitely.” The lines’ intersections create voids: the vertical, bare, scarcely illuminated, unavoidable spaces, form an area that embodies the notion of absence. The interior, composed of reinforced concrete, adds a cold paralysing atmosphere to the space where only slivers of light emanate from the top.

The reflective “Shalechet” (faded leaves) installation, composed of over ten thousand open-mouthed faces cut from iron plates, covers the floor of the Memory Void, Figure 43. The sculptures filling this void evoke the terror of the innocent victims lost during the Holocaust. The building has a dual function – it is just as much a museum as it is experiential. It uses the experiential to tell the story and make it feel real, but it is also a repository for the complete history of the Jewish people in Berlin.
The diagrams and correlating images above illustrate how visitors experience the Jewish museum. The entrance lies within the Baroque Kollegienhaus (college building). Visitors descend by stairway through a large bare concrete void to an underground basement level. From this point on one is completely enclosed with limited relation to outside. An underground passage connects the old and new buildings, preserving the independence of both structures at street level, while still being deeply interconnected. The descent leads to three underground axial routes, each presenting opportunities to witness the Jewish experience.

The first axis, ‘Axis of Death’, becomes darker and narrower finishing in a closed cell with one window far too high to be reached. The door closes and groups of visitors remain in there for a few minutes before it opens again. It is a very literal way of invoking the experience of being in a gas chamber.

The second axis, ‘Axis of Emigration’, represents those who were forced to leave Germany, which leads outside to the Garden of Exile. Here a grid of concrete pillars contain a series of willow trees. Every box is tilted 12° degrees from the vertical. This tilt puts the occupant off balance, losing all sense of what upright is. This sensory device gives visitors a real feeling of what it means to be displaced from the familiar.

The third and longest, the ‘Axis of Continuity’, leads the visitor up a grand and sombre staircase to the exhibition spaces. Here a grid of concrete pillars contain a series of willow trees. Every box is tilted 12° degrees from the vertical. This tilt puts the occupant off balance, losing all sense of what upright is. This sensory device gives visitors a real feeling of what it means to be displaced from the familiar.

Throughout the building one experiences tension between the morbid and the lively, between Germany’s past and present. The interactive architecture acts as a storyteller, narrating the deep and tragic life of Jews in WWII for visitors to experience themselves.
Summary

From analysis of each precedent the most relevant lessons were categorised under positives and negatives attributes of each building, in relation to the research project. This was done through the use of diagrams that directly interpret architectural components, providing a deeper understanding of what is successful or unsuccessful when beginning the design process.

Arataki Visitors Centre and Longbush Ecosanctuary were selected as precedent for the education centre in this research project. Their underlying purpose are the same, but their executions differ. At Arataki, a boardwalk bends amongst the native trees, allowing visitors to appreciate the natural environment first hand before being enclosed in a space for education. Expansive decks also offer panoramic views of the Waitakere Ranges, however the building form is limited in its interaction with nature. In contrast Longbush's form is split into three small pods. The separation of programmes as individual entities forces one outside amongst nature. The arrangement of the pods create an outdoor classroom for which the interactive learning experience takes place. Additionally, the use of sympathetic materials and the way the form lightly sits amidst its surroundings are all strategies that invite interaction and appreciation of nature. Both projects, although different in their method, have set a connection with the environment at the forefront of importance. The sensitive approaches to the surrounding landscape and method to subconsciously interact with nature are elements which the education centre should be founded upon.

Te Uru Gallery and The Jewish Museum Berlin were selected on their exhibition techniques for the museum section of the research project. Te Uru's notable characteristic is the way it successfully opens and restricts views, offering only glimpses of the Manukau Harbour when intended. Additionally there are many inquisitive ways in which natural light is brought in and diffused into various galleries. These subtle architectural strategies create a sense of tension and release with the visitor. Restriction of light is also used as a technique in the Jewish Museum for visitors to experience what the Jewish people during WWII felt that even in the darkest moments where it felt like all hope is lost, a small trace of light restores hope. Both buildings use techniques to exhibit the manipulation of the visitors senses, as a way to enhance the experience. This interactive form of architecture is a template worthy of reciprocating in the configuration of New Zealand's wildlife history.
3.0 Site + Context

Figure 53: Causeway between Rangitoto and Motutapu.

“Tōtū te whenua, whātū te tangata.”
“People come and go, the land alone endures.”
3.1. City selection

Should the site be located where the majority of people are, or where the endemic wildlife are?

The aim of the project is to educate the uninformed public about the urgent need to protect New Zealand's wildlife. Therefore it was decided to choose a site close to a large population base. Positioning the design in a secluded area with healthy ecologies, although idyllic, would only provide for the few people living or visiting there. Their decision to visit would suggest that they are already informed of New Zealand's unique wildlife, and consequently are not the target audience. With 72% of New Zealanders living in urban environments, many have restricted exposure to wildlife, and it is these people who are the target audience. The table adjacent shows that Auckland has the greatest population and it therefore provides the best opportunity for raising ecological awareness on a large scale. With growing numbers and more people moving to the big cities it is vital more than ever that there are resources available for city dwellers not to lose their connection with their natural environment.

However in order to educate the public on ecological conservation, wildlife needs to be present. Typically, where people are, endemic flora and fauna are not. An investigation was made to find a suitable site in close proximity to the Auckland CBD, that has the potential to provide the habitat for endemic flora and fauna.

<table>
<thead>
<tr>
<th>Rank</th>
<th>City</th>
<th>Population</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Auckland</td>
<td>1,495,000</td>
<td>1871</td>
</tr>
<tr>
<td>2</td>
<td>Wellington</td>
<td>405,000</td>
<td>1870</td>
</tr>
<tr>
<td>3</td>
<td>Christchurch</td>
<td>389,700</td>
<td>1868</td>
</tr>
<tr>
<td>4</td>
<td>Hamilton</td>
<td>230,000</td>
<td>1936</td>
</tr>
<tr>
<td>5</td>
<td>Tauranga</td>
<td>134,000</td>
<td>1963</td>
</tr>
<tr>
<td>6</td>
<td>Dunedin</td>
<td>118,500</td>
<td>1865</td>
</tr>
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Figure 54: Hectic life of Aucklanders

Figure 55: Location of New Zealand’s big cities in relationship to the distribution of bird species - watercolour

Potential sites were filtered by looking only at sites within forty minutes drive from the CBD. Their suitability was judged by a table of criteria, namely, accessibility, variety of endemic birds, heritage and culture, current conservation programmes, existing educational facilities, current public popularity and topography. Motutapu Island and Puketutu Island were shortlisted. Puketutu Island, located in Mangere, is only thirty-five minutes drive from the CBD and close proximity to the Auckland airport. The island isn’t currently open to the public, occupied by Watercare as a waste-management plant, and the Kelliher Estate only open to private functions. However there are proposed plans to develop the island into a regional park, which creates potential to convert the island into a wildlife reserve. The reasoning for not choosing this site was the lack of current public transport to the area and the scheme was becoming more of a biodiversity paper, as it would need an extensive relocation plan to have the necessary variety of endemic birds, which would limit the architectural impact. Alternatively Motutapu Island, situated in the Hauraki Gulf, was selected for the following attributes; close proximity from the CBD, existing exposure to public, a variety of existing flora and fauna, pest free, and the vast cultural history on the island. The unique and significant geography and ecology of Motutapu provides an exclusive opportunity to develop a meaningful approach to conservation architecture. The only query was whether Hauraki Gulf needed another wildlife sanctuary when Tiritiri Matangi Island is already so established. To get a better understanding I had a meeting with Graham Jones, senior lecturer in Environmental and Animal Sciences at Unitec. His participation in the beginnings of Tiritiri Matangi and its huge success made him the ideal person to question the viability of this project. His response was clear, “the more the better”.

The success of Tiritiri Matangi would not deter from the project on Motutapu, but instead they could be mutually beneficial, with assistance like excess birds from Tiritiri Matangi relocated to Motutapu. He stated that another island closer to Auckland Central with appropriate infrastructure will provide another avenue of conservation awareness that isn’t available right now. A trustee on the Motutapu Restoration Trust (MRT) noted that in 2002 designs were proposed for an education facility, and although the scheme fell through, there is still a large interest. The insight that there is a demand for public education on conservation strengthened the reasoning for choosing the island.

Figure 56: Site location map
3.2. Physical Context

The physical nature of Motutapu Island, "sacred island" in Māori, has changed a lot throughout the years. Once covered in lush forest full of wildlife; early occupation by Māori saw its topography change to a pastured land, as they burned the forest and ate the bird-life. The eruption of Rangitoto cleared what was left of Motutapu's trees and covered the land in ash, which subsequently produced friable soils suitable for agriculture. Remnants of what was once there are found on the three-hundred archaeological sites. This includes nine pa sites holding the first buildings on the island. The islands of Motutapu and the newly emerged Rangitoto are adjoined by a causeway constructed by US servicemen stationed on the island during WWII; yet their physical qualities could not be more contrasting. One island dating back to Gondwanaland, the other is New Zealand's largest and youngest volcano. Motutapu, its geology in the Jurassic origin, is made of ancient greywacke more than 160 million years old with twenty million year old sedimentary strata. Rangitoto, the product of an eruption six-hundred years ago, consists of scoria cones at the pinnacle of a broad ring of lava flows. The islands lie in the Hauraki Gulf just a thirty minute ferry trip from Auckland's CBD.

Motutapu's physical connection with the iconic Rangitoto Island is advantageous for not only its potential in attracting visitors to the structure, but also providing a contrasting ecology for visitors to experience. With more than 160,000 visitors exploring Rangitoto itself for its summit walk, there is an opportunity to exploit the well-regarded island as a way of enticing visitors to the project. The interconnecting roads and tracks allow visitors to explore the differing ecologies, walking over lava holds and through lava caves in the sparse forest and over the causeway to a more sparse landscape with an abundance of bird life. An analysis of possible ant points of arrival to the site and the experience of the journey itself, was studied in the design process.

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Existing infrastructure on Motutapu and Rangitoto Island vary in typology. While Rangitoto exhibits remnants of baches and two wharfs, Motutapu holds a variety of structures. The historic Reid homestead, constructed in 1901, is the base for the Motutapu Restoration Trust, and includes a display of the homestead’s history and a small kitchen. Currently volunteers congregate outside the homestead to hear their assigned tasks at the start of the day, and enjoy a BBQ, hosted by the trust, at the end of the day. Volunteers occupy the grounds, as there is insufficient space inside. This is acceptable in summer, but it is undesirable in winter months when shelter is necessary. The Motutapu Restoration Trust (MRT) was formed in 1994 with its aim to restore the natural and cultural landscape of Motutapu. Thousands of volunteers have worked on the island in its twenty-two years, with over 450,000 trees and ninety hectares planted from the nursery, situated near Islington bay.

Bunkers and barracks still remain from World War II. What was once an Artillery Camp, serving as barracks for the battery personnel and as overall headquarters for the island, is now the facilities for Motutapu Outdoor Education Camp (MOEC). Based in Administration Bay on the northern shores of Motutu, the location is listed as an A1 Historical site (NZHPT listing), with the buildings still preserved in their original design. MOEC plays a large role in the education of youth with over eight thousand children a year using the educational camp for recreation and restoration learning. The solar panels in Figure 59, shown on the northern pitch of the barracks currently supply’s power to all of the island.

The Island is managed by the Department of Conservation (DoC) in partnership with MRT. In 1987 DoC was formed to be the custodian of the natural Heritage of New Zealand. DoC manages one third of New Zealand’s land area, and is involved with promoting, protecting and rehabilitating endangered spaces for the benefit of present and future New Zealanders.
Fifteenth_May 2016

This initial site visit was an exploration of Motutapu Island and a fragment of Rangitoto Island by foot, to get an overall appreciation of the character of the island. Significant natural features, current infrastructure and bird sightings were noted for the purpose of understanding the best site location which were of notable beauty, and which sites should be ruled out due to inaccessibility. We docked at Home Bay on Motutapu and walked across the island via Ecology Track over to Islington Bay. It was a planting day, so the island was very busy, the majority of commuters were volunteers. Fortunately this meant the rangers and members of the trust were around. Mary Flaws, a board member of the Motutapu Restoration Trust was especially helpful when hearing about this project. Later Mary provided hard copies on Motutapu’s restoration plan and the previous environmental education facility design brief that was instigated in 2000, but which never came to fruition.

Twenty first_August 2016

A site had been selected prior to the second visit. Islington Bay lies between two hugely differing ecologies. The location serves as the middle point in terms of visitor access from Rangitoto and Home Bay wharf. Islington Bay wharf, a few minutes walk is also a popular resting spot for sailors. This time we docked at Rangitoto Wharf to experience the opposite point of access to the site. This indicated a clear idea of the distance to the site from the various arrival points, and also the differing experience leading to the site: the view shafts, and types of flora and fauna present being of particular interest. The number and variety of birds and bird calls were heard and in and around the site provided reassurance for the site selection. From 11am till the time we left Islington Bay at 1.10pm, kereru and finch were fluttering in the tops of pohutukawa trees, fantails were curiously dancing around us, the melodious calls of saddleback were heard, a pair of paradise shelduck were constantly calling to one another, and a mass of oystercatcher and caspian tern were bathing in the winter sun on the sandy shore. A sample of soil was taken, to test if it’s qualities are suitable for rammed earth.

A sample of soil was taken, to test if its qualities are suitable for rammed earth.
Motutapu’s natural landscape, its geology in the Jurassic period, has an ecological history which has evolved, sometimes dramatically, through the ages. Today the landscape is also a reflection of the impact of both Maori and early European occupation which will be discussed in section 3.4.

The pest free island covers an area of 1510 hectares, the majority being farmed pasture. The original forest was destroyed six hundred years ago by the Rangitoto eruption, however small remnants of post-eruption native forest including puriri, karaka, kohukohu, taraire, and flax remain, with pohutukawa trees growing on the coastal fringe. Since the replanting initiative began in 1994, approximately ninety hectares of native forest have been planted by thousands of willing volunteers. With the expansion and upgrade of the nursery in 2014, the current four hectares that were planted per year has doubled to eight hectares. The sizable increase in annual forest footprint will see the island slowly undergo a major transformation that will ultimately have a dramatic impact on the island’s ecological activities. The major restoration project is being lead by Motutapu Restoration Trust (MRT), with the intention of restoring and enhancing the island’s natural and cultural values.

Motutapu and its bordering neighbour Rangitoto, are both administered by the Department of Conservation, and were declared pest free sanctuaries in August 2011. They play host to thousands of locals and tourists each year, but also home to some of the country’s most endangered bird species, such as the takahē and saddleback (tuki).

Never could two ecologies be more contrasting than Motutapu and Rangitoto, one of the oldest landforms in New Zealand paired with the youngest. Having proximity to landscapes on both ends of the age spectrum enables visitors to be further informed on New Zealand biodiversity, as opposed to experiencing just one ecology. Together with an educational facility and thriving ecologies Motutapu and Rangitoto are poised to become the largest island sanctuary of its type in New Zealand. It’s landmass is about twenty times the size of neighbouring sanctuary Tiritiri Matangi, and twice the size of Kapiti Island. Having two islands with such unique indigenous ecosystems and history in such close proximity to the country’s largest city, provides the perfect opportunity to not only restore their ecological integrity but also to provide major benefits for NZ tourism, and public education.

Figure 67: Collecting rubbish along Motutapu coastal fringe
Figure 68: Contrast between Motutapu and Rangitoto
Endemic + native birds found on Motutapu Island

<table>
<thead>
<tr>
<th>Common name</th>
<th>Maori name</th>
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<tbody>
<tr>
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<td>takahe</td>
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<tr>
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<td>Saddleback</td>
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<td>tauhou</td>
</tr>
<tr>
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<td>poaka</td>
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<tr>
<td>NZ pitt</td>
<td>warou</td>
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<tr>
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<tr>
<td>Spur-winged plover</td>
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<td>takipu</td>
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<tr>
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<td>aisake</td>
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<td>Paradise shelduck</td>
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<tr>
<td>Bellbird</td>
<td>lekere</td>
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<tr>
<td>Whitehead</td>
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<tr>
<td>Fantail</td>
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<td>Kaka</td>
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**Native**

Endemic Common name

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The flora is vastly different between the two islands. Rangitoto consists of an abundance of pohutukawa trees, while Motutapu has a variety of native and introduced vegetation, but sparse in numbers, clearly evident in the vegetation layer, Figure 73. The images to the left show some of the flora that are present around the site.
3.4. Cultural + Social Context

Motutapu has a history of occupation that encompasses virtually the full span of New Zealand settlement. It is one of the earliest places inhabited both by Māori, and later by Europeans in the Auckland region. The landscape seen today is the product of two different cultures where each has left a clear mark. The island’s long and diverse living tradition began some eight hundred years ago when it was first inhabited by the Ngā iwi Tūatara tribe. With more than six centuries of Māori occupation “the island is important in the traditions of both Arawa and Tāmaki, and it is home to prominent ancestors of several iwi and hapū associated with these wider tribal groupings.” There are more than three hundred significant Māori archaeological sites, including one of the most acclaimed sites in New Zealand – the ‘Sunde site’ from which human and dog footprints are preserved in solidified ash layers from the aftermath of the Rangitoto eruption. This search for sustenance, introduced species, participation in WWII and compounding effects of the Rangitoto eruption natural disaster has affected Motutapu’s natural environment, changing it from a once forested land stretching to the shoreline, with bountiful amounts of bird life, to an open pastoral landscape.

Figure 74: Historical layer

Figure 75: Public arriving from Auckland to attend a picnic held by the Reid family
Baches constructed on the lava-strewn shores of Rangitoto Island are some of the earliest in the Hauraki Gulf. In 1890 the island was declared a recreational reserve and soon after it became open for public enjoyment. In 1911 the Domain Boards started to lease out sites for campers to cover the costs of administering the island, and this eventually led to over 140 baches being built on the sites. At the time of my visit Dave would stay on Rangitoto Island at his Aunt’s bach. He recalled going for walks at night and glancing at the wallabies. Nadine, another member of the bach community posted on the Rangitoto website, reminiscing about her time at the island:

“Rangitoto and its baches are the heritage of all Aucklanders, but I’ve always felt like they were my personal, private heritage too. Four generations of my family have enjoyed bach life on Rangitoto Island. One of my earliest memories is set at Islington Bay … walking around the shoreline one summer afternoon, the scoria hot beneath my feet, and eating iceblocks from the store.”

-Nadine Elwell.

Although the memories are fond ones, there was some disquiet about the impact the baches were having on the island’s unique ecology prompting a prohibition order on further building in 1937. On the death of lessees their baches began to disappear from the landscape. The empty infrastructure of vacant building sites and boat ramps can be seen around the coastline as shown in the image adjacent at Islington Bay. Today only 34 baches remain. The remnants no longer seen as a blemish in the landscape, but rather irreplaceable artifacts of New Zealand’s architectural and social history.

Architecturally, Rangitoto’s baches merge the kiwi-do-it-yourself attitude with hints of California bungalow. The baches are situated on lava flows on the fringe of pohutukawa forest along the coastline. The varying building techniques, ranging from orthodox to improvised, and the reusing of salvaged materials add to the architectural individuality of the baches and to their local historical importance.

Figure 76: Residents of Rangitoto Island
Figure 77: One of the remaining 34 baches on Rangitoto Island
Figure 78: Remnants of a bach
Figure 79: Te Hira Bach by Islington Bay causeway
Figure 80: Historical time line of Motutapu’s history

**ERUPTION OF RANGITOTO**

The eruption of the subaquatic Motutapu in 1800, causing settlement delivertion and destruction of villages. Intermittent ash showers last up to 100 years. However, the ash also provided a new wealth of ash modified soils. Gradually, ancestors of Tāne Mahuta to remember. Fish and shellfish sprout on beds as a main source of protein due to lack of forest.

**MUSKET WAR**

Potato tribes armed with muskets, active from the Bay of Islands. Local tribes suffered heavy losses. Many local tribes ceded and move South in response to the threat of further raids. This raid was part of a Māori rail campaign to exterminate warfare among Māori from 1847-1845, after Māori first obtained muskets in order to gain dominance or seek revenge for past defeats. As many as 2000 battles and raids fought throughout New Zealand and tens of thousands of Māori were killed, wounded or displaced.

**INITIAL MĀORI SETTLEMENT**

The island is used to have been a center of “Tāne Mahuta, who gathered the Māori hunting of forest birds and small clearance of establishment of first house.

**TREATY OF WAITANGI**

On the 6th of March, the Treaty of Waitangi is signed between the British Crown and various Māori chiefs from the North Island of New Zealand. On Motutapu, Ngāi Tai will be the northern part of the island (2108 acres), in January 1840, to Thomas Mathew. Mathew paid 15 casks of powder, 4 double barrel guns, 80 blankets. 1 case of fish, 6 cakes 22 pounder horses, 5 cases of black muskets, 55 green pieces 5 cases of muskets and the adomion island of Rākiri and the Nones.

In 1885 the British sign an agreement with the Strand to use the island for defence purposes. The following year, construction begins for the soonest headquarters of the Strand Battery, which was used to quell the problem of naval attacks. The island is known as the Department of Conservation in 1987.

**NEW ZEALAND REVOLUTIONS**

The Māori Wars (1845-1872) and Rangitoto were fortified to defend Auckland Harbour from warship attack. The Military Camp consisted of 8 barracks buildings, officers quarters, dining and mess rooms, hospital, etc, with an apron of 400 mm. Germany surrendered on 8th August.

**WORLD WAR II**

New Zealand enters World War II. During the war, both Motutapu and Rangitoto were fortified to defend Auckland Harbour from air attack. The military Camp consisted of 8 barracks buildings, officers quarters, dining and mess rooms, hospital, etc, with an apron of 400 mm. Germany surrendered on 8th August.

**PEST FREE ISLAND**

August 2011: The islands of Motutapu and Rangitoto are officially declared pest free. The very rare endangered species translocated feral rabbits, and European rabbits, are killing introduced. Wildlife thanks to the thousands of volunteers.
4.0 Design Process

Figure 81: Initial diagram of the brief
Initial Concepts

Upon deciding on which approach to take to enhance wildlife awareness to New Zealand public, three concepts were drawn. Each explored ways people could interact with surrounding wildlife, whether it be ground level, below ground, or above.

Each had their own unique interaction with wildlife, however selecting a single educational technique would limit the potential exposure for awareness, therefore aspects of all typologies were incorporated into the chosen concept. Personal interaction with surrounding wildlife and factual education on the wildlife that should be protected are necessary to provide Environmental awareness, therefore a education centre and a museum would house the experience and information for the design accordingly. The enclosed and restricted space of concept two formed an early idea for the museum. Enclosed spaces enables the occupant to be immersed with the educational displays, while small openings enhance the connection to the outside. A lighter, more open and visual typology surrounded by wildlife, like concept one and three, would inform the design for the education centre.

Figure 82: Concept one: Learning Pavilion
Figure 83: Concept two: Underground Bird Hide
Figure 84: Concept three: Tree House
4.1. Brief

The design is intended to create an educational portal to the wildlife of Motutapu Island for both tourists and the New Zealand Public.

This project is an amalgamation of two programmes; a memorial for the lost and an education space to protect the surviving. Incorporating functions for both portions of the programme and taking account of how their different objectives interrelate.

In 1996 the Motutapu Restoration Trust proposed the idea of building an educational centre, however the design never came to fruition. There are three overarching ideas/messages mentioned in the Trust’s education strategy which are useful for developing the brief. Firstly to provide a holistic approach to the environment, which recognises Motutapu as a complete functioning system, a microcosm of wider New Zealand. Secondly, to promote sustainable management of resources. “Toitū te whenua, whatungarongaro te tangata” - people come and go, the land alone endures. This is demonstrative of the holistic values of Māori and their respect towards Papatuanuku -mother earth. Lastly, the power of collective individual action. The cumulative effect of individuals contributions makes a difference. Individually and collectively all are responsible for determining the future of our landscape.

The success of habitat restoration is reliant on the support from the public. Support will be achieved by exposing public to New Zealand wildlife and forming an emotion connection through sensory experience as a reason for why would want to help. Using not just architecture as a medium, but looking to various artists for ways to express particular senses, as well influential aspects from the precedent study. A brief is provided to ensure all components of each of the above elements are considered from the beginning of the design process, including information from literature and precedent study.

1. Experience

The primary aim is to educate both the New Zealand public and tourists on the effects current lifestyles are having on the country’s fragile ecologies. The intention; to promote conservation knowledge, which will lead to nature-conscious lifestyles and subsequently thriving biodiversity. This project will strive to establish a respect for wildlife by enabling a wildlife experience that encompasses the following values:

• Escape
• Exploration
• Remote
• Hope
• Enlightenment
• Closeness to Nature

2. Aesthetic

The aesthetic of spaces and building elements shall respond to the surrounding natural environment, displaying a sensitive relationship between built form and nature.

3. Function

The project will include areas and facilities which cater for:

Educational requirements

• Interactive learning
• Observatory
• Briefing space
• Common space
• Kitchen + dining
• Equipment storage
• First aid facilities
• Abilations
• Reserves
• Environmental

The Education Facility should have a capacity for eighty people to account for general public which includes the average of fifty volunteers present on planting days, and/or MOEC students using the building as the beginning of their camp. A generous outdoor area must be provided for public to encroach onto in case of an influx of numbers.

4. Potential Driver/s

The facility will be used and operated by Motutapu Restoration Trust (MRT) who would work closely with the following cognate organisations:

• Department of Conservation (DoC)
• Motupu Outdoor Education Camp (MOEC)
• Royal Forest and Bird Protection Society of New Zealand
• Ministry for the Environment
• Worldwide Fund for Nature (N.Z)
• Tertiary Institutions
• Nga Tai
Getting Started

The amalgamation of information gathered from literature, precedent studies and site analysis implements a framework from which ‘research through design’ can begin.

Application of this framework will involve the use of architecture in stimulating emotions of occupants to display grief, remorse, and hope. This challenging task reinforces the need for an iterative and exploratory design process. Design process initiated by exploring the five aspects of experience visitors will encounter. This began with escape and exploration through site analysis. Remorse, enlightenment and hope followed later.

4.2. Site Analysis

This analysis investigates the physical attributes of the site which are related to the development of the design process. This includes analysis of axis points of arrival, public paths, sections, and contours to determine where this project will be best located.

The experience, mentioned in the brief begins with escape; an escape from the bustling city environment. The means to get to the island whether it be by ferry service, kayak or private boat is part of the overall experience.

Upon arrival public participate in an exploration of their surroundings on their path to the site. The journey to the site will yield emotions. The smell of fresh air, the sound of birds chirping, the lava rocks beneath your feet, the sight of wondrous scenery, these all have an effect on the occupant, an emotion that will be carried when entering the building. The point of arrival is essential, as the sensations felt will provide stronger emotional impact in the sequence of events to follow.

It will be important to take into account the proximity of existing wharfs and the possible points of arrival to the site. The location of the structure would also have a significant visual impact on the setting so its position needs to be sensitively considered, also taking into account the views to both Rangitoto and Motutapu’s ecologies. Additionally, the many archaeological sites on the island must be respected. The site topography consists of flat grassed land on the waters edge with lava rocks dotted around, giving a hint of what consists of the adjoining island. The flat land abruptly ends to a steep hill, here pohutukawa line the top, with other native trees occupying the bank. The topography will influence the location of the proposed structure, because of its relationship with ecological experiences. The materials and textures of the site generate a strong aesthetic. It will be beneficial for the aesthetic of the structure to be sympathetic with these existing qualities.
Location:
This location was chosen because of its central location between the two main wharfs, with the option to use Islington Bay Wharf. By positioning the site between the two island visitor routes there would be a contrast both visually and physically to the contrasting ecologies. The site is unique in that the surroundings differ depending on where one approaches from, for example, in the public could be experiencing the ecologies of Rangitoto only to encounter a causeway to a grass covered land. Islington Bay estuary is also a hotspot for a variety of shore birds. The trees on site also provide an opportunity to partially conceal a structure avoiding visual disruption from the Motutapu landscape and achieve a sensitivity to the natural features, and the flora and fauna.

Figure 86: Location proximity diagram outlining the three wharfs in relation to the site.
Figure 87: Image of three wharfs

Access:
It is essential to understand how the public will arrive on the site, and ways to entice foot traffic towards the site.

Rangitoto Wharf to site:
There are two options. The Coastal Track is four and a half kilometres long and takes two and a half hours to walk. It is a popular walk for swimmers, yachtsmen and picnickers, passing many of the baches and ruins of World War II storage areas. The alternative, and easier route runs inland along a road built by prisoners and takes one and a half hours to walk.

Islington Bay Wharf to site:
A five to ten minute flat walk to the wharf nestled amongst existing baches.

Home Bay Wharf to site:
This is a moderate walk over farm land and cliff tops and takes one and a half hours, providing expansive views of surrounding islands, such as Motuihe.

For people that find the walking distance to the site unmanageable, there is the potential to use the four wheel drive tractor-train service that currently transports people from Rangitoto Wharf to the summit. These visitors would be picked up from the Rangitoto Wharf and driven to the site, taking fifteen to twenty minutes.
Figure 88: Section of Rangitoto and Motutapu
Figure 89: Access diagram to site
The textured cliff face of Motutapu Island, in Figure 90 (left), shows a layering of soils, topped with volcanic ash, giving a glimpse into the vast history of the island.

Figure 91 (right), shows what it is like to approach the site from Rangitoto in its existing condition.
Figure 92: Author's two sections showing the topography of the site

SECTION B-B

- Proposed site
- Pa Site
- Pohutukawa along the cliff fringe
- Sandy shoreline

SECTION C-C

- Coastal wetland
- Islington Bay
Point of arrival

To Home Bay Wharf
(On Motutapu)

To Islington Bay Wharf
+ Ramotu Wharf

Figure 93: Model showing visitor’s point of arrival. By Author

Figure 94: Sun study of the site. “Note only the museum is shown, education centre not included in this study

Sun study

Autumn Equinox - March 20
Winter Solstice - June 21
Spring Equinox - September 22
Summer Solstice - December 21
4.3. Overall Plan Strategy

The structure comprises of two components; a Museum and a Conservation Education facility. These two entities have their own prerequisites, in accordance with the overall brief.

The structure will provide facilities for exhibiting the lost and protecting the present. A physical interpretation of the history of New Zealand’s wildlife. As displayed in Figure 96, the project is categorised into four zones to programmatically divide the space. The first is dedicated to ‘Life Before Humans’, the second ‘Māori Arrival’, and third ‘European Settlement’ and together they make up the museum section. Upward gesture of ‘Hope’ for the future of wildlife, will house the education facility. This narrative of New Zealand’s wildlife history, created by the zones, is influenced by Liebeskind’s Jewish Museum.

Each zone will be explored as its own entity. The project becomes a psychological journey through time, beginning at ‘Life Before Humans’ (zone 1), and ending at ‘Hope’ (zone 4). Through this journey, each zone will invoke a different emotion, through architectural gestures, relating to the zone’s educational topic, referred to in section 2.5. Emotions may include sadness, grief, disorientation, remorse, enlightenment and hope. Each zone will explore the openness and closure of space, tension and release, restriction of views, and play of light to encourage emotive responses appropriate to the visitor’s experience.

In order to facilitate the desired psychological experience, art installations and media, particularly sound, will support the architectural proposition.
The diagram (Figure 96) was then overlayed on the chosen site to get a basic understanding of the buildings organisation in relation to the site. The bubble diagrams also helped establish a relationship each section has to the other. Designing with the intent to maintain existing qualities of the landscape, like existing native trees, to reduce impact of the site. Several iterations of formalising of the bubble diagram then took place, until a basic layout was achieved (Figure 98).

The decision to build into the cliff was made in the site research phase. From analysing Motutapu Island, it was made apparent that the geology of the island is a historical treasure, with many archaeological sites. That being said, it is mandatory for the architecture that sits on the island to be keeping with the environment. With this project being large in size, having the whole building above ground would prove to be an eyesore and a black mark on the surrounding ecologies. By selecting a location with no archaeological sites, and no existing native trees, the ecological impact would be minimal. The possibility to dig into the ground, or in this case cliff side, is a temporary disturbance for a sensitive aesthetic solution to the surroundings, where the vegetation can be restored once the build is complete.
Earth Building

The museum and educational centre will house the promotion and awareness of ecological conservation, therefore there is a responsibility to reciprocate the care for wildlife in the built form, illustrated through material choice and the buildings sensitivity with the surrounding environment. What better way than to use a material from nature. Using earth, an eco-friendly material, strengthens the connection with nature. Additionally, the decision to excavate into the cliff, will yield copious amounts of earth for the build; the land emerging in a new form, sitting amidst the landscape.

The advantages of using earth construction are:
- Locally sourced
- Non-toxic building material
- Fire resistant
- Durable yet biodegradable
- Breathable
- Regulates internal temperature
- Natural colour

Upon deciding earth building as a core material for the design, further knowledge was required to understand what earth technique would be used, whether it be rammed earth or adobe brick, and the process involved.

Alan Drayton, Director of BioBuild was the ideal person to have explain the process and suitability for the design, by showing prototypes of past builds, like in Figure 101. Twenty-six years since becoming increasingly aware of the negative impact the building industry is having on the prosperity of the planet, Alan has been contributing to building biologically and ecologically sensitive solutions.

To discover “what the soil wants to be” as Alan says, two soil samples were taken from two different locations, Motutapu Outdoor Education Centre (sample one) and the chosen site at Islington Bay (sample two), labeled in Figure 102, so that they are understood to have different soil types, greywacke and sedimentary strata respectively. Soil was dug before collecting the earth, so as not to collect the topsoil. To understand what the soil wants to be, the soil was wet and made into a sausage, if it held it wanted to be mud brick. Sample two held its form as a sausage, sample one however sample 1 fragmented. Secondly a jar test was conducted to see the consistency, seen in Figure 105. This reaffirmed that sample 2 has too much clay and is not appropriate for rammed earth. An alternative is to use the rammed soil of sample 1, however this defeats the point of using the excavated earth from the site location.

87 Personal communication with Alan Drayton, member of BioBuild, 9 December 2016, 14 January 2017.

Figure 101: Alan Drayton showing rotten rock rammed earth prototype (11th Dec 16)
Figure 102: Map showing two soil samples taken from Motutapu Outdoor Education Centre and the site at Islington Bay
Figure 103: Soil sample 1: MOEC
Figure 104: Soil Sample 2: Site, Islington Bay
Figure 105: Jar Test of the two soil samples. (left) MOEC (right) Site. Note the layering consistency
A shrinkage test was then implemented to see the amount of shrinkage in the mixture. A boxing measuring 50x50x600mm was made and lined with newspaper to absorb the moisture. The homemade attempt in (Figure 109) indicates a large volume of shrinkage, in comparison to one of Alan’s tests, which show significantly less shrinkage. All three tests show that it is not possible to do rammed earth construction using the site’s soils, but it is suitable for adobe brick. Now it is understood which earth technique is achievable, further experiments with mixture of earth would be done to find the ideal mixture, and then explore types of render finishes.

Adobe bricks, or mud bricks, are made from a wet mix of earth and sometimes barely straw and/or paper pulp, poured into moulds and then dried in the sun. When constructed they are laid in courses with mortar. Before drying out, the finished walls are smoothed down. A clay render is applied as a surface coating. This is a relatively simple building process for people with limited resources, ideal for the construction on Motutapu Island, as it removes the need to transport machinery, and it can all be done on site. Figure 110 shows a simple explanation of the process of building with adobe brick.
The museum will be displayed as a physical time line of New Zealand wildlife, a chronological journey through time emulated in the linear structure. To further understand the process, the museum will be segmented into time zones. The following diagram (Figure 110) is indicative of the chronological information that will be displayed in the linear structure and takes note from the graph of extinct birds in relation to pest arrival, shown in Figure 9 on page 27.

The history of New Zealand wildlife will be exhibited using works by selected artists, both local and international, with the architecture providing a fitting backdrop. Both the architecture and the exhibition will display a particular emotion, depending on the zone. The works align themselves directly with the meanings of conservation, each artist bringing a unique way of focusing attention towards the same goal. Temporary exhibition space will be provided for emerging artists, with the potential to hold public exhibitions. The artworks are allocated into four groups: Life Before Humans, Māori Arrival, European Settlement and Hope, with each section corresponding to the given period in the physical time line of New Zealand wildlife.

The architecture for the museum becomes solid, grounded and reflects the qualities of the surrounding landscape. Not much is shown from exterior as the majority is underground, minimising the intrusion of stairs and disturbance to ecologies.

The diagram on the following page, (mentioned earlier) ties the museum together. A thin horizontal strip will begin at zone 1 and continue along the walls ending at zone 3. The strip signifies a physical graph of birds, a heart rate of New Zealand wildlife. Starting at the top of the wall the strip will drop each time a bird becomes extinct, and show information and an image of that bird. This simple but effective technique has a big impact on the public, as the suspense is added every step you take, interacting physically as it gets lower and lower until you have to be on your hands and knees. Questions and intrigue will grow in the public’s mind, and eventually form an attachment to the topic - wildlife. How many more will become extinct? Why do we keep killing them? With the idea that once at the end of the museum, people are so emotionally attached to the birds that passed, their next move is not to go home and forget about it, but to ensure this doesn’t happen anymore - which is where the education centre comes in.

Programme: (Elaborated from section 4.1)

Life before humans (entrance to building)

Reception

• 40 people capacity (accounting for school groups)

• have direct access to education space from the entrance

• washrooms, including disabled toilets

• reception, with storage behind

• seating space

Māori exhibition space

• Permanent exhibition space

• Temporary exhibition space

Threshold

European exhibition space

• Permanent exhibition space

• Temporary exhibition space

• Access to education facility (hps)

The materials in this section will reflect the sensorial enclosed nature of the spaces, therefore strong well ground materials will be used. From earlier research on possible earth techniques in section 4.3 earth building, it was discovered that adobe brick could be made from the earth on site. Using adobe brick as the main material for the museum part of the building will embed the facility into the landscape. Secondary materials include concrete and wood.
Figure 111: Continuous strip displaying the extinct birds in chronological order.
**Zone 1: Life Before Humans**

The beginning of the story of New Zealand Wildlife

The architecture in this zone is the first encounter the public will have with the building. The entry must be inviting and integrated with the existing landscape. By locating the art installation at the entry, exposed to the existing main axial route that connects Rangitoto and Motutapu, it serves as a way of inviting people on approach into the building.

**Programme:**

- Installation
- Entrance/Foyer (with seating)
- W/C, including disabled toilet
- Reception (with storage)
- Access to education centre
- Access to museum

The ground floor plan below (Figure 113) highlights zone 1. After the open-air installation, which will be explained on the following page, the long linear path slowly mitigates light and restricts space until the occupant is enclosed in a circular volume. The visual connection to the outside is restricted from here until the end of the museum. The circular form serves as a marker in the landscape. There are two possible routes: option one, up the stairs with direct access to the educational centre for people that have been through the museum before, or volunteers of the island; option two, which leads the visitor to the beginning of the museum journey.

Figure 112: Site plan of zone 1 (left)
Figure 113: Ground floor plan highlighting zone 1 (above)

This diagram illustrates the variation of movement through the installation as one enters the museum. Entering around the pillars, touching and observing are the first actions forced upon the occupant. The interactive display produces a different perspective with each approach.

Figure 114: Early sketch of a visitor’s movement through the entrance.

Figure 115: Early sketch of a visitor’s movement through the entrance.
The installation in this zone explores the possible methods to illustrate the rich and abundant life in New Zealand before the arrival of humans - beginning with a representation memorial of the sixty-one extinct endemic birds. 'Terraforms,' a recent installation by Australian visual artist Jamie North, is an illustration of what might occur with a collaboration between artist and architecture for the 'life before humans' zone. The poetic sculptures are a cluster of pillars constructed using cement, marble waste, limestone, and steel slag and coal ash as sculptural materials. This combination would be complimented by a mix of New Zealand native plant species. What North likes to call 'the synthesis of natural and artificial.'

The pillars resonate with the natural formations of tiny islets covered in forest, uninhabited and unaffected by humans. Positioning twenty-five islet-like pillars in a square formation represents the archipelago of islands that made New Zealand. The sixty-one birds will be entwined amongst the concrete forest, either by the form itself or a footprint embedded in the ground, on and around the pillars - enabling the public to grasp, for example, the sheer size of Moa by comparing its footprint with one’s own. The positioning of the installation facilitates a meandering approach through the pillars - an interaction with the exhibition, which will vary depending on the chosen route. The interactive, tangible nature of this installation allows one to immediately grasp the concept and experience the emotions of the programme, and anticipate what is to come.

Entrance:
Once through the memorial to the birds that once were, visitors continue along the sobering path to the entry. What was once fully exposed to the wind, sun and views is now reduced. The restriction increases the further one travels inward, until the connection with the outside is completely absent.

Figure 119 shows concepts of the entrance, playing with volume of space, light and potential texture through use of materials. The linear gestural walls angled outwards was a key component in the development, as it creates a sense of embrace, which is strengthened along the narrowing path as you enter the building. It was instantly evident that although both '1' and '2' incorporated the embracing entry, the lack of interaction with light didn't create the sense of anticipation needed.

The play of light, created intriguing shadow patterns from the beams, emphasising the restriction of light and loss of warmth, as the beams’ spacing tightens and the path narrows. Stimulation of the senses is important in this project as a means of inspiring an emotional attachment to wildlife with the hope to broaden conservation knowledge.
Zone 2: Māori Arrival

In this zone, the information about Māori settlement, deforestation, habitat loss and the extinction of the first thirty New Zealand birds, is portrayed in factual form, highlighted through sensorial experience. The horizontal strip of New Zealand extinct birds (Figure 110), starts in this zone and gradually make its way down the wall to zone 3.

Utilising the surrounding steep cliff edge, this zone pierces into the landscape separating the user from the exterior environment, showing only small glimpses of environment where intended. A sense of confinement is purposely created, thereby removing the user from the context, limiting the visual senses and enhancing audial.

Two spaces form the Māori zone, the first space is light and large in volume, as it symbolises the early arrival of Māori to the shores. There is an over-present noise of bird calls in the space, mimicking the deafening sound of the ancient forests when birds were thriving and didn't have predators. A narrow space acts as a threshold to the next, using volume to subconsciously inform the visitor that they are entering a new area. This space, though still focusing on Māori occupation, is quieter than the other and more subdued. The noise will continue to diminish the further one moves through the building, signifying the loss of birds. The watercolour, adjacent (Figure 122), is an interpretation of the emotions felt inside the zone, showing the sight of a thriving land, and the early destruction of that environment.

Selected artist Lisa Reihana, mentioned later, signifies what could inhabit this space to strengthen the narrative.
The drawings and models explore changes in volume, and its interaction with light. Playing with light restriction and glimpses of views.
This work will act as the transitional space between Māori arrival on New Zealand soil and European settlement, providing a view on the early interaction between the two cultures.

The most recent work of Māori artist, Lisa Reihana, ‘In Pursuit of Venus (Infected),’ is a representation of what could occupy the threshold space between the Māori and European zones.90 The tableau is a moving image interpretation of the French scenic wallpaper Les Sauvages De La Mer Pacifique (1804).91 Two centuries later, Reihana has employed twenty-first century digital technologies to animate the utopian Tahitian landscape in a renewed perspective. While Dufour’s work models Enlightenment beliefs and ideas of harmony amongst mankind, Reihana’s reading of the past is darker and more nuanced. Enlivened with the sights and sounds of dance and cultural ceremonies, the thirty-two minute-long cyclical panorama video is populated by a myriad of people/vignettes drawn from across New Zealand and the Pacific.92 At twenty-five metres long and four metres high the moving tableau requires a long linear space, complimentary to the museum narrative time line which is linear in its description.93

Reihana highlights the complexities of cultural identity and colonisation by including scenes of encounter between Māori and European. The tension between the two cultures provides an exploration of how history is represented, and how it dramatically influenced the surrounding environment. The location of such a piece would be placed in the transition space from ‘Māori arrival’ to ‘European settlement.’

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90 Is the sequel to ‘Pursuit of Venus’ which is eight minutes long and presented on two-screens.
92 Ibid
93 Ibid
Zone 3: European Settlement

Silence! Gone are the deafening sounds of bird calls, the remaining forests empty, void of life. This is the atmosphere portrayed in the European section. It is a continuation of the Māori zone, describing the effects European settlement had on wildlife and their habitat. Thirty endemic birds fell at the hand of humanity, another thirty-one will share the same fate in this zone. It will expose the worst of wildlife’s vulnerability and attempt at survival, at times making people feel distressed and even shamed. In this zone, one journeys further into the story of New Zealand wildlife, and with that moves further into the cliff face. The programme in this zone is more restrictive than zone 2, fully separating the user off from the exterior environment. All visual connections to the outside are removed, with limited natural lighting from above; complete immersion. Isolation from the outside enhances the sudden exposure to the surrounding environment, which occurs in zone 4: Hope. The plan below (Figure 129) shows the space becoming tighter and tighter until one reaches a dead end. The intent is for people to feel upset, to trigger a feeling of empathy for wildlife so that when they reach the Hope section (behind them) they want to take action and help the remaining wildlife.

Figure 128: Site plan of zone 3
Figure 129: Ground floor plan of zone 3

Figure 130: Interpretation of the bleak mood felt in the European zone
This zone will reflect the silence, terror, and loss that was apparent when European settlers arrived on New Zealand soil.

This installation represents the increased vulnerability of New Zealand wildlife when European settlers arrived ashore. Northern Irish artist, Claire Morgan, creates sculptures exploring the vexing relationship between people and their natural environment. "My work is about our relationship with the rest of nature, explored through notions of change, the passing of time, and the transience of everything around us." The fragile yet striking portrayal of such a conflicting topic exemplifies what might occur in this zone, heightened by the still, airy silence from the architecture.

Morgan’s sculptures show elegantly taxidermied animals on the verge of falling, leaping or flying, as depicted in Figure 132, ‘Gone to Seed’ installation. The animals frozen in movement is emphasised by the interaction with monumental geometric shapes that seem to float. The creation of the delicate shapes are from seeds, flax, or pieces of plastic hanging from nylon threads. According to Morgan, 

“by using artificial materials, such as plastic, she also exposes the destructive relationship that mankind has with nature.”

An array of these installations will be exhibited in the European settlers section of the Museum. Their high sensory impact will express the ambivalence of life to the visitor, the feeling of uncertainty, despair and hopelessness will spark a desire to change. The life of New Zealand fauna is hanging in the balance and it is humans to decide whether their life will be saved, or left to fall to its impending extinction.

Figure 131: Cat waiting for its next meal (above)  
Figure 132: ‘Gone to Seed’ installation symbolising the fragility of life
Zone 4: Hope

In this small but crucial zone, the visitor has completed the journey through New Zealand wildlife history, and feels that all is lost. But there is hope! Hope and optimism are portrayed to the visitor with small architectural gestures; a slight incline up the stairs subconsciously suggests the idea that “it’s” getting better. The path weaves them back through zone 1 and 2 (Figure 134), reminiscing of the past events, this time at a higher level. As you ascend up the ramp a small strip of light is seen above, symbolising the idiom “light at the end of the tunnel”. Once at the top an expansive view to the outside is exposed, something that has been restricted since zone 1. The view is of New Zealand’s beautiful landscape, what humanity needs to protect. Hope is continued in the education centre, which is where that emotional attachment formed in the museum and knowledge on the necessity to protect these vulnerable unique creatures is put to good use.

Figure 133: Site plan of zone 4 (left)
Figure 134: Mezzanine floor plan of zone 4 (above)

Figure 135: Interpretation of the hope and optimism felt after experiencing the journey through the museum.
The sectional axonometric (Figure 136) shows the museum design in its simplest form. A walk through of how one would journey through the zones. The blue dotted line embodies a person going directly to the education centre (not depicted), while the red dotted line meanders through the museum and up to the education centre. The sketches above iterate how one moves through the spaces, each zone illustrating a educational intent.

Figure 136: Sectional axonometric showing the journey through the museum (left)
Figure 137: Example of what may occur in the zones from the four images (above)
4.5. Education Centre

The understanding of the importance of wildlife has been detailed in the museum. Naturally, the next step is to restore the damage done. The challenge is to ensure people don’t inhabit and enjoy the museum and then go home and forget. The knowledge public has received and the emotional attachment to wildlife from the museum is put to practical use. Restoration initiatives throughout the island currently include: planting, nursery work, checking traps and bird watching; the education centre would be the meeting point for those tasks, as well as the inclusion of conservation classes at the centre, operated by either Doc or Motutapu Restoration Trust. The education centre aims to remove the ‘Bystander Effect’, the idea that some one else will do it, as mentioned in a quote by Robert Swan earlier "The greatest threat to our planet is the belief that someone else will save it".

It is important to note that there will be many visitors who will go directly to the centre from the main entrance, rather than the longer museum route, because they are Trustees of the restoration initiative on the island, or frequent volunteers.

Programme:

The education centre serves as the main hub for the island. It will be used as Motutapu Restoration Trust’s communal space for scheduled meetings and fundraising events, and additionally serve as the first stop for MOEC students on their trip, before continuing to camp for recreational education. The facility must include the following:

- W/C
- Small kitchen come tuck shop (the decision to not include a cafe is to prevent the centre from becoming commercialised. It is a space for learning, where provision of food is essential, but not highly regarded.)
- Outdoor sheltered seating and BBQ area
- Indoor communal space
- Learning rooms come offices
- Educational space for restoration displays

Materials:

The materials used in this section change from the solid enclosed feel in the museum section to a lighter more open space. In addition to wood, materials such as glass and gabion rock provide the visual connection with the surrounding environment. An additional feature of gabion rock is the potential to house small ecosystems between the rocks, in keeping with interactive approach of the centre.
The floor plan shown (Figure 140) highlights the necessary programmes for the education centre. Locating the centre on the top of the hill allows visitors to overlook the land they are trying to protect. Adjacent sketches illustrate the external movement throughout the site, and the secondary access provided, on the eastern side of the building, for commuters arriving from home bay wharf.

Figure 140: Floor plan of education centre

Figure 141: Sketch from the eastern hillside showing secondary access to the centre

Figure 142: Exploratory sketch of the communal space

Figure 143: Secondary access to the centre
5.0 Design Outcome

Figure 144: Axonometric of overall design embedded in the landscape
Figure 145: Design outcome of the overall building.
This research project presents one example of how architecture can be used as a mechanism to create awareness and appreciation of New Zealand wildlife, and therefore enhance its protection.

The literary content provided a historical understanding of what type of wildlife were here before human arrival, the cause and effects human occupation had on existing wildlife, and conservation actions in place today. The process of formulating relevant information to strengthen an understanding of the topic, naturally amalgamated journey through New Zealand's wildlife history.

Once an understanding of wildlife was achieved, the next step was to create an emotional attachment to wildlife that most public don’t currently have. Research on biophilia, the term coined by E.O. Wilson, arrived to the conclusion that comprehensive awareness might be achieved by a sensory experience generated by architectural techniques. The human senses; sight, sound, touch, taste and smell, have been implemented as tools to enhance the educational journey one makes through the spaces. Influenced by Peter Zumthor’s nine elements, mentioned in his book ‘Atmosphere’, several architectural strategies were explored to create an appropriate atmosphere in relation to the zone. Exploring restriction of light, tension and release, openness and enclosure as a means to create a full sensory experience on the visitor.

The decision to display the history of New Zealand wildlife as a chronological sequence of events allows the visitor to walk through time; to become immersed in the story and observe how New Zealand’s landscape changed from a thriving ecosystem to a damaged land, and to realise the sudden vulnerability brought upon the endemic birds as a result of human intervention. The values of escape, exploration, remorse, hope, enlightenment and closeness to nature can be used to analyse the degree in which ‘Sound of Silence’ is established. These values are shaped by the emotions visitors may experience going through the four zones: ‘Life Before Humans’, ‘Māori Arrival’, ‘European Settlement’ and ‘Hope’. The outcome is a sequence of spaces that create intangible sensory experiences and inform a personal connection with wildlife.

To ensure the project did not end abruptly, once enlightened in the museum section, the emotional connection formed with wildlife is channeled to physical engagement with wildlife at the education centre. Here the building is light and open, using architectural techniques that engage with the surroundings. The centre houses the Motutapu Restoration Trust, in
partnership with organisations listed in section 4.1, and is the foundation for conservation and restorative initiatives. A number of discoveries have emerged from this research. Most significantly the value of engaging with space, not purely through sight, but involving a full sensory experience. The concept of emotionally engaging the visitor in the tragic story of New Zealand’s wildlife revealed an opportunity for architecture to not just be a space to hold information, but also to enhance the information and, therefore, create an emotional connection with wildlife. Specifically this furthered my understanding of how senses could strengthen a narrative. The relevance of biophilia has hopefully indicated a direction for creating the public ecological literacy New Zealand so urgently requires. At a minimum this research has comprehensively outlined the importance and fragility of New Zealand’s wildlife, and the urgency to protect these beautiful creatures.

Critical Reflection

Undertaking a broad scope of research, specifically the conservation section, contributed to a greater understanding of New Zealand’s environmental situation, which although is not directly applicable to the design, raised an understanding of how I might approach the design solution. If the process were to continue, a highly detailed prototype of off grid systems including, water collection, a photovoltaic system, and recycling solutions would be included. Developing the potential to operate on a self-sustaining level and integrate into the ecologies of Motutapu is key. The integrity of the design as being truly ecologically informative architecture, hinges on the success of detailed features such as this. Another consideration that would have strengthened this research project, was a continued development on materiality, more specifically the material adobe brick. This would include; investigating the ideal earth mixture, possible textures and colours and exploring render finishes. The journey to Motutapu Island restricted further investigation on the mentioned topics, as a minimum of 2 x 20L buckets is required to do one adobe brick. The act of getting the soil and walking it to the nearest ferry limited what research could be done.

Admittedly, the education centre did not get as much attention as the museum, and therefore could improve in the following ways. A comprehensive understanding of the programme was not fully considered. As mentioned in section 4.1, Motutapu Restoration Trust did propose to build an educational facility, however it never came to fruition due to complications with the relationship it would have with MOEC. Collaboration with DoC, MOEC and MRT, would aid in understanding what programmes to be considered, to ensure a successful partnership, this may also form a better architectural outcome. Although reforestation is occurring on the island, with 90 acres of land planted in native trees each year, the wildlife naturally comes later, so it is hard to predict when the island will become sufficiently abundant. For now, the massive undertaking of re-planting and re-introducing endemic bird life to the island, reinforces the credibility of designing on a potential restorative ecological success.
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Websites:


8.0 Appendix

One of 32 existing haches on Rangitoto Island.
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Figure 16  WWF campaign poster
Figure 17  Juvenile takaha
Figure 18  Thermal Val by Peter Zumthor
Figure 19  Arataki Visitors Centre
Figure 20  Longbush Ecosanctuary
Figure 21  Te Uru Contemporary Art Gallery
Figure 22  Berlin Jewish Museum
Figure 23  View from platform overlooking Waitakere Ranges
Figure 24  Sketch of Pou
Figure 25  Form of the building
Figure 26  Surrounding context
Figure 27  Approach and entrance
Figure 28  Diagrammatic plan of all levels
Figure 29  Sketch of people approaching the shelter
Figure 30  Floor plan of Longbush
Figure 31  Diagram of the pods arrangement to outdoor classroom setting, tied by the roof
Figure 32  Outlook from viewing tower
Figure 33  Diagram of the pods arrangement to outdoor classroom setting, tied by the roof
Figure 34  Drawbridge to connect workshop with the outdoor classroom
Figure 35  Street front of Te Ura
Figure 36  Floor plans from entrance to top floor
Figure 37  Balconies and alcoves provides views through the building, giving alternative perspectives.
Figure 38  This vast artwork in itself, both directs and diffuses light.
Figure 39  Aerial view of Jewish museum Berlin
Figure 40  Diagrammatic plan of all levels
Figure 115: Interpretation sketch of the installation by the Author

Figure 116: Sketch of a single pole

Figure 117: Jamie North’s “Terraform” installation

Figure 118: Man walking down the entrance path

Figure 119: Model concepts of entrances, playing with casting shadows

Figure 120: Site plan of zone 2

Figure 121: Ground floor plan highlighting zone 2.

Figure 122: Interpretation of what it feels to walking into the Maori zone

Figure 123: Sketch showing light permeating through at different heights

Figure 124: Concept sketch of a dead end space

Figure 125: Light study using models

Figure 126: Scene from ‘In Pursuit of Venus (Infected)’ by Lisa Reihana

Figure 127: A section of the twenty-five metre long video installation ‘In Pursuit of Venus (infected)’ by Lisa Reihana

Figure 128: Site plan of zone 3

Figure 129: Ground floor plan of zone 3

Figure 130: Interpretation of the bleak mood felt in the European zone

Figure 131: Cat waiting for its next meal

Figure 132: ‘Gone to Sleep’ installation symbolising the fragility of life

Figure 133: Site plan of zone 4

Figure 134: Mezzanine floor plan of zone 4

Figure 135: Interpretation of the hope and optimism felt after experiencing the journey through the museum.

Figure 136: Sectional axonometric showing the journey through the museum (left)

Figure 137: Example of what may occur in the zones from the four images

Figure 138: Materials used in the education centre

Figure 139: Watercolour of the existing surrounding environment with proposed education centre on the brow of the hill

Figure 140: Floor plan of education centre

Figure 141: Sketch from the eastern hillside showing secondary access to the centre

Figure 142: Exploratory sketch of the communal space

Figure 143: Secondary access to the centre

Figure 144: Axonometric of overall design embedded in the landscape

Figure 145: Design outcome of the overall building
8.2 Final Presentation Drawings
Motutapu Way - to Home Bay

1:2500

Islington Wharf

Islington Bay Road - to Rangitoto Wharf

Coastal Track

Rangers Hut

Nursery

Right: 1:2500 site plan

Above: direct relationship to nature at the education centre.
Zone 1: Life Before Humans

Zone 2: Maori Arrival

Zone 3: European Settlement

Zone 4: Hope
Above: cantilevered platform stretched out into the trees; the final and most intimate connection with New Zealand wildlife.

Above: education centre settled amongst its surroundings, with Rangitoto seen in the distance.
Above: sectional perspective showing the four zones, the change in levels and the buildings' relationship to the landscape.
Above: Model photos – detailed showing the interior of the museum embedded in the steep hill.
8.3 Extras

Above: Sketch of curious cows on Motutapu Island
Testing the Motutapu Island clay, mentioned earlier in the document, concluded that adobe brick was a viable earth technique and therefore could be used in the design. A prototype was made to display what the texture and colour of an adobe wall could look like.

Process of making an adobe brick:

- Place clay obtained from the site in a bucket and submerge in water overnight.
- Mix the clay using your hands, or a pneumatic drill into cream clay (smooth, no solid partials).
- There are a number of different mixtures to make adobe brick, but for this one, add 10% of paper pulp to the clay, followed by 25% of straw. Add ingredients in small increments while mixing.
- Add wood shavings until refusal.
- Place mixture in the form in layers, making sure its in the corners and pushing down each layer.
- Leave to dry in the sun until the brick can hold its shape.
- Remove brick from form and leave to dry, turning it on edge to dry all sides.

Above: ‘ingredients’ wood shavings
Above: ‘ingredients’ paper pulp and straw

(This mixture is half of a standard size and blended with a trowel.)
Criteria for New Zealand’s Threat Rankings

Nationally Critical
- Less than 250 mature individuals (natural or unnatural); or
- 250-1000 mature individuals and 50-70% decline over 10 years or 3 generations; or
Any population size with a greater than 70% population decline over 10 years or 3 generations, whichever is longer.

Nationally Endangered
- 250-1000 mature individuals (natural or unnatural) with a 10-50% population decline; or
- 250-1000 mature individuals (unnatural) with a stable population; or
- 1000-5000 mature individuals with a 50-70% population decline.

Nationally Vulnerable
- 250-1000 mature individuals (unnatural) with a population increase of more than 10%; or
- 1000-5000 mature individuals (unnatural) with a stable population; or
- 1000-5000 mature individuals with a 10-50% population decline; or
- 5000-20,000 mature individuals with a 30-70% population decline; or
- 20,000-100,000 mature individuals with a 50-70% population decline.

Declining
- 5000-20,000 mature individuals with a 10-30% population decline; or
- 20,000-100,000 mature individuals with a 10-50% population decline; or
- >100,000 mature individuals with a 10-70% population decline.

Recovering
- 1000-20,000 mature individuals with a population increase of more than 10%

Relict
- 5000-20,000 mature individuals with a stable population; or
- More than 20,000 mature individuals with a stable or increasing population; or
- All Relict species occupy less than 10% of their original range.

Raised pod amongst the trees, with a connection to water. This was an initial concept for creating a physical experience with wildlife.
Status of New Zealand birds between 2008 - 2012.

Status of New Zealand birds between 2012 - 2016.

The two tables categorise birds residing in New Zealand in the given period. The definition for each category is defined on page 158. The two data deficient birds are the South Island kokako and the South Island brown teal. The three added birds to the extinction chart are Chatham Island birds believed to become extinct during first human arrival.

1.4 2016 assessment
A summary of the numbers of taxa in each threat category in 2008 (McKinnon et al. 2008), 2013 (Roberts et al. 2014) and in 2016 is presented in Table 2, and a full list of the taxa with their 2016 status, qualifiers which apply to each, and the criteria used to place the taxa into the category is presented in Section 3.1.

Table 2. Statistical summary of the status of New Zealand bird species assessed in 2008 (McKinnon et al. 2008), 2013 (Roberts et al. 2014) and in 2016 (this document). Note that direct comparisons of extinct and vagrant species are difficult because more taxa were assessed in 2010 than in 2008.

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>TOTAL 2008</th>
<th>TOTAL 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endemic</td>
<td>38</td>
<td>38</td>
</tr>
<tr>
<td>Data Deficient</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Threatened: National Critical</td>
<td>24</td>
<td>23</td>
</tr>
<tr>
<td>Threatened: National Endangered</td>
<td>15</td>
<td>18</td>
</tr>
<tr>
<td>Endangered: National</td>
<td>59</td>
<td>54</td>
</tr>
<tr>
<td>IUCN: Near Threatened</td>
<td>27</td>
<td>24</td>
</tr>
<tr>
<td>IUCN: Vulnerable</td>
<td>100</td>
<td>104</td>
</tr>
<tr>
<td>IUCN: Lower Risk</td>
<td>15</td>
<td>13</td>
</tr>
<tr>
<td>Protected: Non-breeding</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Protected: Non-breeding</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>Non-threatened: Collins’ Endangered</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Non-threatened: Relict</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Not Threatened</td>
<td>36</td>
<td>36</td>
</tr>
<tr>
<td>Extinct and Introduced</td>
<td>32</td>
<td>37</td>
</tr>
<tr>
<td>Total</td>
<td>407</td>
<td>407</td>
</tr>
</tbody>
</table>

Of the 10 taxa assessed in this review, we added 5 (1 non-threatened and 4 threatened), of which 4 were extinct before 1800 and 1 since 1800. Two (1 non-threatened “South Island brown teal” and one threatened “South Island kokako”) whose status were again classified as Data Deficient. Although we consider that both of these taxa are likely to be functionally extinct, we are not convinced beyond reasonable doubt that the last individuals of these taxa have died.
Distribution of birds in New Zealand
Referenced from The atlas of bird distribution in New Zealand.
Declaration

Name of candidate: Hannah Smith

This Thesis/Dissertation/Research Project entitled: Sound of Silence

is submitted in partial fulfillment for the requirements for the Unitec degree of Master of Architecture

Principal Supervisor: Min Hall

Associate Supervisor/s: Graeme McConchie

CANDIDATE'S DECLARATION

I confirm that:

- This Thesis/Dissertation/Research Project represents my own work;
- The contribution of supervisors and others to this work was consistent with the Unitec Regulations and Policies.
- Research for this work has been conducted in accordance with the Unitec Research Ethics Committee Policy and Procedures, and has fulfilled any requirements set for this project by the Unitec Research Ethics Committee.

Research Ethics Committee Approval Number: ..........................................................

Candidate Signature: .......................................................... Date: 24/02/17

Student number: 136 2596
Full name of author: Hannah Smith

Full title of thesis/dissertation/research project ('the work'): Sound of Silence

Practice Pathway: Architecture
Degree: Masters of Architecture

Year of presentation: 2017
Principal Supervisor: Mr. Hall
Associate Supervisor: Graeme McConchie

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