The Development of the Kaitiaki Kids Conservation Program

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Sponsored by:
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The Development of the Kaitiaki Kids Conservation Program

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by

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Abstract

The goal of the Kaitiaki Kids Program is to connect conservation programs already in place around the Wellington area to give children a more in-depth education about all conservation topics. Our project seeks to develop a recommendation as to how the Kaitiaki Kids program could be structured by researching programs that already exist in the Wellington region, to establish what conservation topics children should learn about, and to determine gaps already in conservation education that the Kaitiaki Kids program could fill. In order to accomplish this, we conducted online research and interviewed eleven experts in conservation and environmental education.

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Acknowledgments

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Executive Summary

New Zealand's unique ecosystem has drastically changed since the arrival of humans approximately 1000 years ago. Before this time, the land was mammal free (except for native bat species) and made up of plush flora where 80% of the native plant species were endemic to New Zealand. With the arrival of the Māori people, forest coverage went from 80% to 50% and with the arrival of the Europeans the rainforest decreased to 23% and the wetlands were reduced by over 90%. With the arrival of humans and the introduction of predator species, like the possum or stoat, the unique fauna and flora that made up New Zealand began to decrease and the need to take action to protect the environment became a necessity. By taking action, New Zealand strives to become "predator free" and works to restore the native ecosystem that originally made up New Zealand.

Currently there is a large push to educate children about conservation in hopes of making conservation efforts a social norm. There are many programs around the Wellington area, but they are all focused on different conservation topics. Due to the many number of programs out there, it can be hard for someone to find a program they want.

The Kaitiaki Kids program aims to bring together many conservation programs into one central program in hopes of giving children a more well-rounded education about conservation by utilizing the knowledge and resources of the programs that are currently in Wellington. The Kaitiaki Kids program is still in its initial stages of development. The goal of this Interdisciplinary Qualifying Project is to aid in the initial development of this program by researching what is currently available for conservation programs and how the Kaitiaki Kids program might be structured.

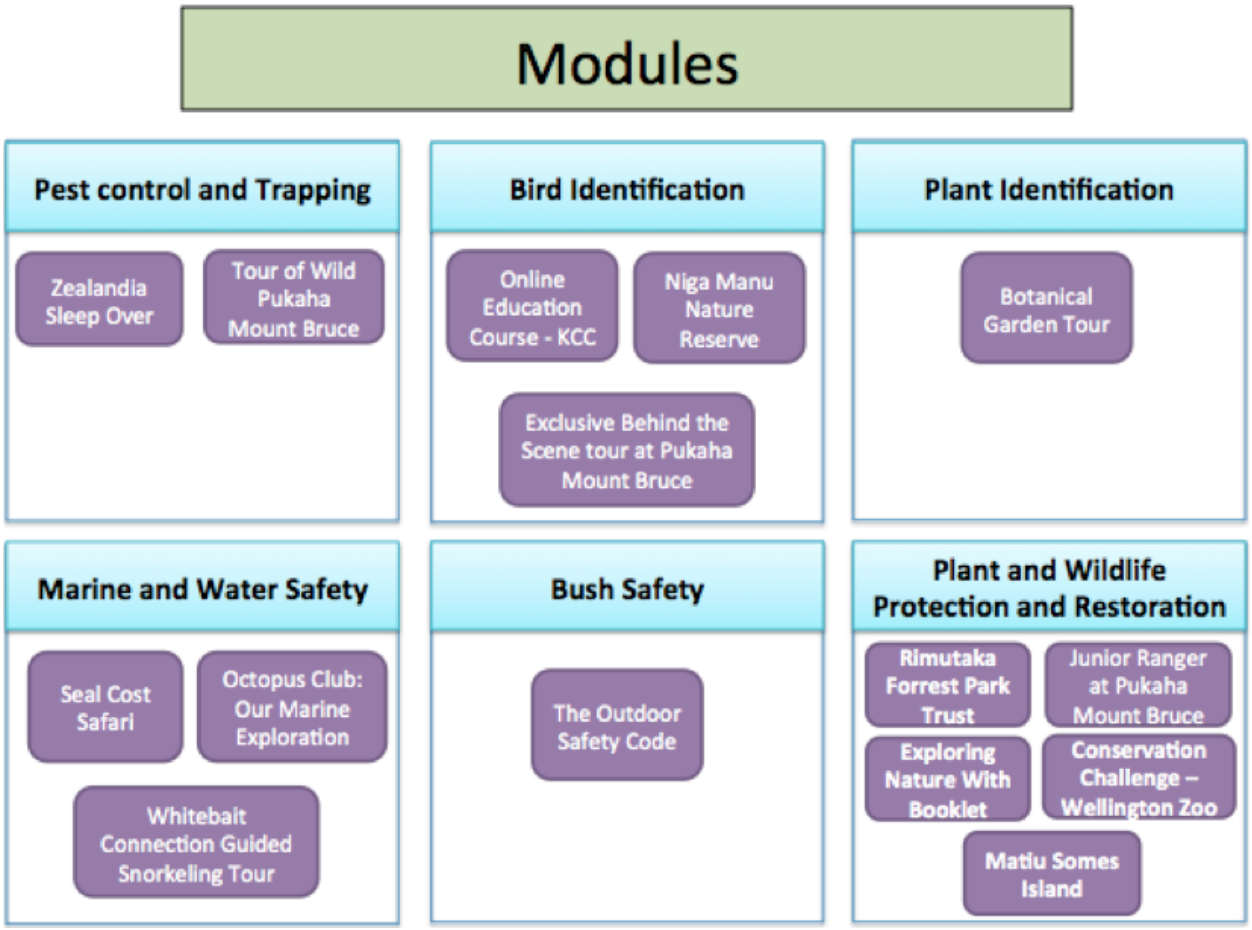
In order to accomplish the task of designing a new program, we interviewed experts in conservation and education to better understand what constitutes a successful program, what are the most important conservation topics children should learn today, and what resources are needed to develop a new program. To analyze each interview, we transcribed the interview and then used color-coded themes to highlight common quotes among the interview discussions. Then, by looking at common themes, we were able to ??? identify best practices (which ones)?? To supplement this, we also conducted online research to identify current conservation programs

in the Wellington area. Through our research, we found forty programs in the area that were focused on educating children about conservation. Lastly, our sponsors asked us to propose a group of modules and programs to serve as the basis of the Kaitiaki Kids program.

To propose these modules and programs, we developed a set of criteria from our interviews to use as a method of analyzing the forty programs we found. The criteria we used to select our final recommendation of fifteen programs included:

- Providing hands-on activities for the children
- Engaging children in nature
- Enhancing critical thinking skills
- Producing deliverables; activities that the child completes after the program for continual learnin
- Designing programs that last longer than a day to solidify the knowledge the children gained in the program
- Balancing fun with educational activities
- Involving parents

With the information gained from the interviews, we also determined conservation topics that experts felt children needed to be educated about within programs. These conservation topics were used to develop the modules that will become part of the basis of the Kaitiaki Kids program. The fifteen programs have been divided up within each module, as can be seen in the diagram below, to recommend a possible way to structure the Kaitiaki Kids program.



We are proposing a Kaitiaki Kids program that consists of six modules, based on conservation topics experts found critical for children to learn about, as well as fifteen programs based on our criteria developed from our interviews. As this Kaitiaki Kids program is still in development, these modules and programs are subject to change. Currently we view the Kaitiaki Kids program being structured where each child must partake in all of the programs within each of the modules, in order to complete each module and earn some sort of measure, like a badge. Once the child has completed all of the modules, they then can graduate as a Kaitiaki Kid.

From our interviews, we also identified gaps within conservation education efforts in Wellington and New Zealand that we deemed important for our sponsors to recognize when developing their program. These gaps were determined through our discussions, as many of our interviewees brought up aspects they felt were lacking in conservation efforts today. Many of our interviewees stressed the need to have outreach opportunities in order to attract children of

different backgrounds and to hopefully increase participation for the programs within the Kaitiaki Kids program. In order for the lessons taught in the programs to become part of the child's lifestyle, it is important to have programs that last longer than one day. This means that the program either needs to last longer than a day or have deliverables or actions that the child must conduct after the program is completed. Another gap experts have noticed is that programs need to have a broader approach and focus on conservation as a whole, rather than specific topics. This gap is one of the reasons why our sponsors developed this idea of the Kaitiaki Kids program.

Another major gap discovered through our research and interviews was the integration of conservation within school curriculums. In New Zealand, there are many programs that are incorporated into school curriculums, but there are some challenges they face, such as money, time, and resources. However, although there are many challenges, our interviewees stressed positive outcomes as well. The hope is that by having more conservation programs integrated into schools, it may lead to conservation efforts becoming a norm in society, as children will grow up learning about it on a more regular basis.

Since the Kaitiaki Kids program aims at incorporating many programs from different organizations, we see that it would be difficult to tailor it to each individual classroom. However, we recommend that our sponsors research into possible ways to develop the Kaitiaki Kids program into an afterschool program as it could generate considerable interest among children and make conservation a social norm.

Lastly, as you can see in the diagram above, modules regarding outdoor health and safety as well as plant identification do not have many current programs that focus specifically on those topics. We also did not find programs focused on topics such as water pollution or climate change, though these are topics that our research and interviewees suggested to be important for children to learn about. We therefore recommend that programs and modules be developed in the future in order to enhance these conservation topics. Since many of our interviewees brought up getting resources as being one of the hardest things to come by when developing programs, we suggest that our sponsors look into utilizing the resources other organizations already have. To

do so, we feel that the Kaitiaki Kids program needs to focus on developing strong relationships with the potential organizations that have programs within them, for existing organizations have the resources to create new programs and will have the ability to help promote their organizations.

1.0 Introduction

Loss of biodiversity is an imminent issue that will affect peoples' lives significantly in the future. Eighty-five percent of all species that are on the International Union for Conservation of Nature's list are threatened or endangered animals, and could become extinct due to some issues like habitat loss (World Wildlife Foundation, n.d.). Not only that, but "around half of the world's original forests have disappeared, and they are still being removed at a rate [ten times] higher than any possible level of regrowth" (World Wildlife Foundation, n.d.). These statistics give a glimpse of how important conservation is to the protection of wildlife and animal species across the globe.

Specifically in New Zealand, the loss of native flora and fauna has accelerated since the Māori people arrived between 1250 and 1300 AD and since the arrival of Europeans in the seventeenth century. The percent of forest coverage has decreased from approximately 80% coverage to less than 25% in this period (Rāwiri, 2012) mainly due to burning of forests for farming. Another reason for the decrease of environmental species was the number of mammals, such as rats and stoats that were stowed away or were brought by the Māori and European ships. These mammals became predators of the animals, including flightless birds, which inhabited the land and caused birds such as the kiwi, to become endangered and caused many other species to decrease in size. Other detriments arose since the arrival of humans, such as the extinction of the large flightless bird called the moa due to overhunting by the Māori people. Overall since the arrival of humans, New Zealand's animal species nearly halved including many species that have gone entirely extinct, like that of the moa (Holdaway, 2012).

Although humans have caused a negative impact on New Zealand's ecosystem, it is clear through the efforts of conservation organizations today that it is possible to protect the flora and fauna and restore the unique ecosystem that once made up New Zealand. The Department of Conservation has been the driving force for conservation efforts and has had an impact on improving the biodiversity of New Zealand. For example, there has been an increase in land management and pest control, and as a result forest and bird populations have slightly increased in some areas. Additionally, there has been a drive to reintroduce native species to New Zealand, with the goal of eventually returning the country to its original ecosystem. The Department of Conservation has helped to protect the environment, but there are also many other organizations

within New Zealand that are focused on conservation. There has been an increase in organizations working together in order to share resources and knowledge to help make their conservation efforts more effective and achievable. Organizations are more likely to thrive when working together and this knowledge is the premise for the Kaitiaki Kids program.

Our project seeks to help build a new conservation program called the Kaitiaki Kids program. The Kaitiaki Kids program aims to connect conservation organizations already in place around the Wellington area to give children a more in-depth education about all conservation topics. Conservation education is the process of influencing people's attitudes, emotions, knowledge, and behaviors about wildlife and wild places. Our project seeks to understand current perspectives on conservation education for children in New Zealand, to research programs already active in the Wellington region, to determine what constitutes as a successful children's conservation program, and to identify any current gaps in conservation education.

The name "Kaitiaki Kids" stems from the Māori word "kaitiakitanga", which means "guardianship, protection, preservation, or sheltering" (Royal, 2012, p. 1). The Māori believe that all life is connected and that humans are part of this connection. The Tikanga Māori, or Māori customary values and practices, influence the people to treat the environment with respect and to prevent the overuse of natural resources (New Zealand Conservation Authority, 1997). Kaitiakitanga is the theory that enforces these beliefs. The Kaitiaki Kids program, as currently structured, will seek to embody the ideals of kaitiakitanga. The drive to conserve New Zealand's environment is grounded in these beliefs--that the people are responsible for the protection of nature.

2.0 Background Chapter Introduction

This chapter provides general knowledge of the history of conservation in New Zealand and conservation organizations. First, conservation issues that New Zealand has faced will be explained, and will then go into how the country has fought against these issues to preserve the ecosystem. Lastly, conservation organizations and their efforts are discussed.

2.1 A brief overview of conservation in New Zealand

Over 1000 years ago, before humans arrived on what is now New Zealand, the ecosystem was very different from places already populated by humans, due to its location and separation from other countries (Craig, 2000, p. 62). The land was covered with distinctive plant life and large birds, forming a unique natural ecosystem. One of the first records of the flora in New Zealand was developed by Sir Joseph Banks and Dr. Solander in 1769 who collected "about 360 flowering plants and ferns… [and] about 160 species [of plants]"(Hooker, 1864, p.9). The island was covered with unique plants, many that the European settlers had never seen before. As well as flora, there were many native animals such as the tuatara, moa, kiwi, kokako, saddleback, huia, kakapo, native frogs and giant carnivorous land snail, as well as many more endemic animals (Forest and Birds, 2011).

The Māori tribes arrived in New Zealand approximately 1000 years ago and soon began to affect the environment. The percentage of forest coverage decreased from about 80% to 50%, as shown in the second image in Figure 1, in a span of 700 to 1000 years due to some Māori traditions, including hunting, holding bonfires, and carving trees. The Māori would also burn many forest to help keep paths and make travel easier, as well as to clear land for farming (Wilmshurst, 2012-a, p. 2). An example of overhunting was that of the moa, a bird bigger than an ostrich native to New Zealand, which was believed to be one of the most common birds. Unfortunately, its size and large amount of meat made it a main target for hunting and evidently led to its extinction. These birds had been around for many centuries, yet "The short period during which moa were eaten out of existence is a mere blink in the geological time of moa life" (TerraNature, 2012). These birds were as abundant or more than the kiwi bird, but because of the introduction of human life they were brought to extinction. The loss of these birds as well as many others and native plants were just the start of the biodiversity loss of New Zealand.

When the European settlers arrived in New Zealand, the depletion of the natural environment grew worse. After only 200 years, European civilization decreased the rainforest to 23% and reduced the wetlands by over 90% (Craig, 2000, p. 63) as shown in image three in Figure 1. This was because the European settlers wanted to clear the land to use for farming; they also cut down trees to build houses and towns. One species that they almost completely brought to extinction was the Kauri trees, which were a popular export for the European settlers, and quickly became an important means of industry for New Zealand while they lasted. This caused many problems: without the roots of the trees, the ground dried up, and flooding became more abundant without the trees to collect the rains (Department of conservation, n.d.-g). Additionally, the European settlers used different farming practices because the land was different from their homeland, which caused negative impacts on the unique New Zealand land. “European pasture grasses and poor land management rapidly allowed invasion by introducing rabbit and weeks [a plant], making these lands ecological and agricultural desserts” (Craig, 2000, p. 63).

They also introduced non-native animal species such as possums, stoats, rats, and many more that were part of the cause for the depletion of many bird species. During the time of Māori and European settlement, almost 3000 plants came close to extinction. As well as this, many animals became extinct such as the huia, the Haast’s eagle, the South Island kokako, as well as many others. In addition the takahe, the kakapo and the long-tailed bat were brought dangerously close to extinction (Forest and Birds, 2011). The settlers were unfamiliar with the unique ecosystem they were living in, adding to the rapid decline of the natural flora and fauna of New Zealand.

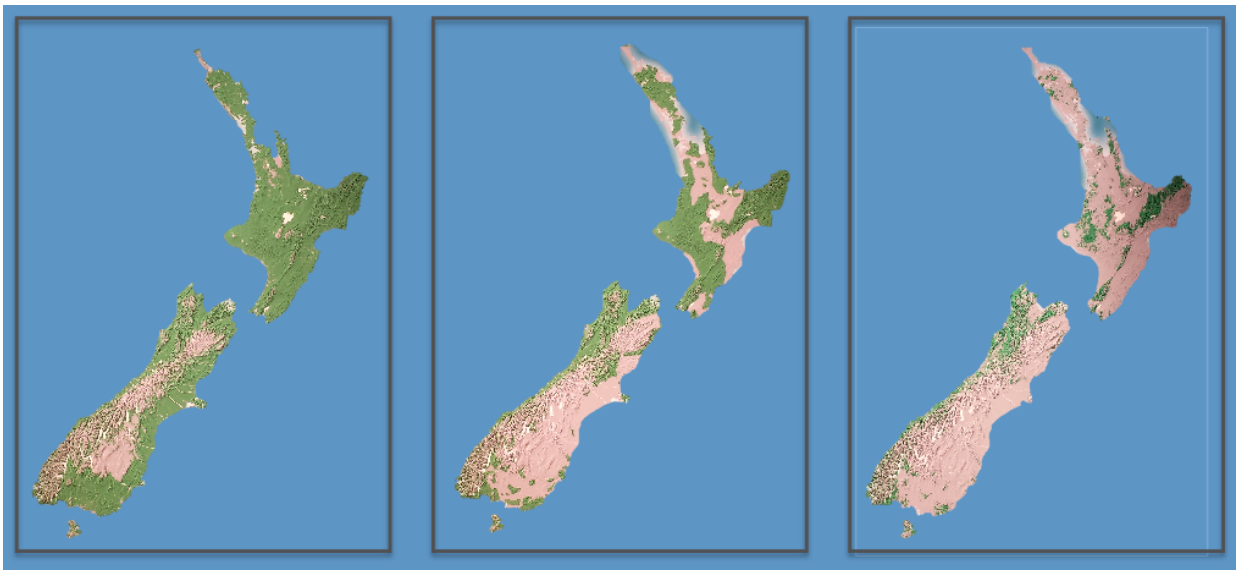


Figure 1: Images of Deforestation of New Zealand found in the Te Papa Museum

In addition to the loss of native animals and fauna, Europeans also introduced many mammals to New Zealand as previously mentioned. The Māori brought two mammals, a Pacific Rat and a dog, and the European settlers introduced more than fifty mammals to the island. These animals were brought here so that there would be wildlife to hunt and animals to farm. Many of the native birds of New Zealand cannot fly, since they had never had an issue with predators on the ground before, and therefore these birds were an easy target for the new predators. These newly introduced mammals caused a rapid decline in the population of native animals. Since their introduction to the land, eleven mammals have become naturalized; ferrets, stoats, weasels, pigs, hedgehogs, possums, dogs, cats, and three more rodents. With the introduction of these mammals, that hunted forty out of ninety-one native land birds, led to the extinction and endangerment of these land birds (Wilmshurst, 2012-b, p.4). As a result, it was clear that action needed to be taken in order to preserve and protect the animals that remained.

To protect New Zealand's wildlife and habitat, laws were passed and groups formed throughout the twentieth century to conserve the environment. The government passed the Conservation Act of 1987, which created the Department of Conservation (DOC) that incorporated both the Forest Service and the Department of Lands and Survey agencies. The goal of this organization was to help "New Zealanders gain environmental, social and economic benefits from healthy functioning ecosystems, recreation opportunities and living out history"

(Department of Conservation, n.d.-a). This department has been a part of creating and enforcing more than forty acts to protect and inform the public about the environment. A few of their most important legislations are: the National Parks Act of 1980, and the Marine and Coastal Area Act of 2011. The National Parks Act has protected and worked on creating a representative national parks system. It has also created the structure so that Whanganui, Paparoa, and Kahurangi National Parks could be created (Department of Conservation, n.d.-b). The Marine and Coastal Area Act of 2011 is one of the most recent legislations that DOC has created. This act states that areas from the beach out to twelve nautical miles from the beach are incapable of ownership (Department of Conservation, n.d.-c). This law has been very controversial because the Māori believe they should have indigenous rights to this land. The act has made it so that everyone in New Zealand has rights to all of the Common Marine and Coastal Areas free of charge, and have the rights to navigation and fish, so many people see it as a good addition (Beverly, 2011).

In addition to enforcing environmental legislation, DOC supports and educates the public about conservation. The DOC website offers tools that the public can use to learn about native animals and plants, about land and freshwater, and also about how to value nature and appreciate the land around them (Department of Conservation, n.d.-d). In addition, the website also discusses many current issues related to conservation and educate to those who are reading about what the problems are and what they can do to help. On their website one can read into what are some of the most important issues regarding conservation in New Zealand today. Some of the issues they deem are most important are pest trapping, weeds threatening native plants, and climate change. These issues are important to New Zealand because of the pride the citizens feel toward their country and wanting to make sure that they can stop pests in order to protect their natural animals, stop alien weeds from ruining landscapes, and address climate change so that New Zealand will continue to be livable to those who call it home.

One issue that DOC is active in is the protection of New Zealand native birds against rodents that live on the island. In New Zealand, beech trees produce large quantities of seeds every two to six years. In 2014 there was an overflow of seeds, which is the perfect food for rats and stoats, and therefore lead to an increase in pest populations. The rats and stoats are predators to many of New Zealand's native birds and therefore DOC has created a motion called Battle for

our Birds: Beech Mast 2014 to inform the public about this issue. There are over ten bird species, including the great spotted kiwi and the kaka, that are most affected by these predators. To help protect these birds, DOC has created a system which requires the inspection of trees and determining where areas will have the most seed fall. They then implement predator control over these areas in hopes of protecting their birds. To inform the public, DOC has put out many informational images, like the one shown below in Figure 2, to inform the public of where the beech seeds are in abundance so that people can be aware of the need for pest control in these locations (Department of Conservation, n.d.-e).

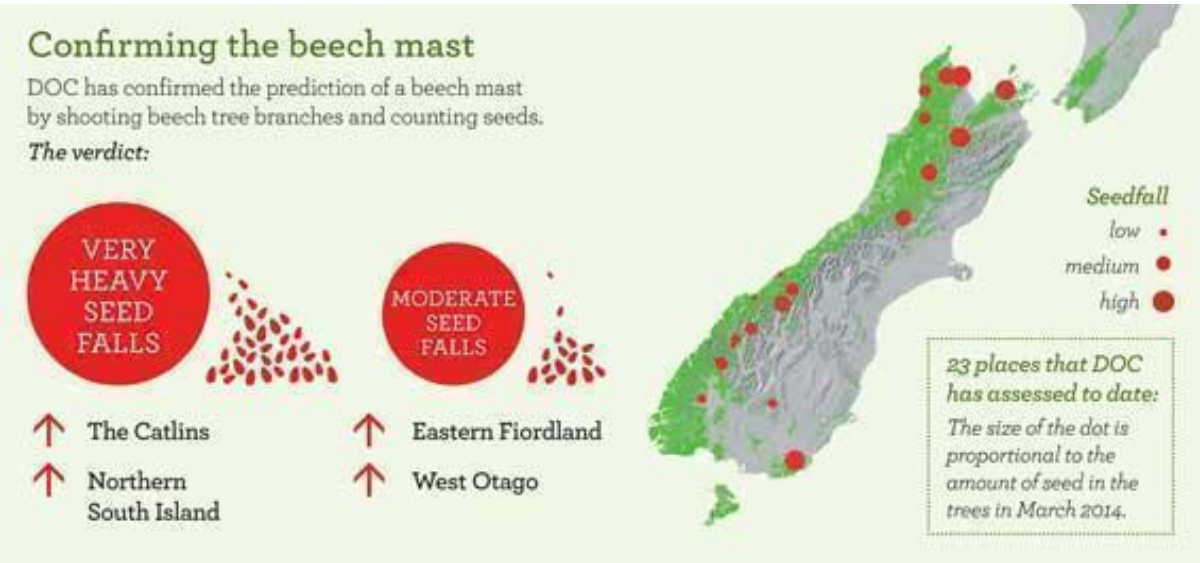


Figure 2: DOC Images about the Beech Mast

With the Department of Conservation developing acts and groups to help control and improve environmental issues has led to positive outcomes such as the increase in land coverage, better pest control, and the increased protection of flora and fauna. For example, “between 1997 and 2002, exotic forest increased in area by 139,500 hectares” (Bunnik, 2007-a) as a result of improved land management. Another issue that DOC has focused on is the control and trapping of pests on the land. Since 2000, DOC has increased its areas to target possums by 60% and in total, 37% of New Zealand's land is under possum management, which has allowed fifteen endemic bird species to increase in recent years (Bunnik, 2007-b). Not only that, 32% of New Zealand land is now legally protected with the help of legislature. Almost five million hectares of land are now protected from deer, pigs, wallabies, rabbits and other pest herbivores. Another initiative of DOC was in 1995-1996 where six ‘mainland islands’ were created. These were a

total of more than 64,000 hectares that were intensely managed to restore the native ecosystem. Research shows "that as a result of management regimes in place populations of native species have been enhanced and ecological processes re-vitalized" (Saunders, 2001, p.116). Within five years there was a significant decrease in pests and increase in native animals, showing that it is possible to for people to have a positive impact on the protection of the biodiversity on the mainland (Bunnik, 2007-a).

DOC is a very important organization working to keep and potentially bring back some of the natural beauty of New Zealand. The Department's job is to support programs and provide education about conservation in such a way that they build support for the restoration and protection of native flora and fauna across New Zealand. Overall, the positive impact people can have on conservation today is evident in the Department of Conservation's efforts thus far and therefore shows the importance of educating people of the impact they can have on conservation specifically in New Zealand.

2.2 Components of successful conservation education programs around the world

Teaching kids the importance of being the kaitiaki, or guardians, of their environment as they start to understand the concept of conservation will cement in their minds that the two belong together. Research suggests that children of ages seven to twelve are the best age group for being taught ideas about conservation and about classification of flora and fauna because it is at this age that they begin to develop an understanding about the ecological world around them and start to develop a strong problem solving mindset and is therefore the targeted age group for the Kaitiaki Kids program (Child Development, n.d.). By researching conservation programs and efforts around the world, it was found that successful conservation programs focus on the education of children, as they are the future of our planet and can be major forces for the protection of the environment.

It is important to understand the teaching methods that are successful in educating children about conservation. One of the best teaching methods research shows is to have hands-on programs to get children better engaged. A case study conducted by Cara Kruse, an educational specialist at the Busch Gardens Zoo, analyzed zoo programs and determined that

getting children involved with taking care of animals in captivity is another way to improve their knowledge of animals and to also help improve their attitudes and behaviors in comparison to how the children acted when they began the program. The case study was conducted at a summer camp where children helped take care of animals in a zoo for a week with varying levels of animal contact. It was found that more time helping to clean cages and feeding the animals led to higher knowledge retention and better behavior and attitudes. This even continued long after the camp ended (Kruse, 2010, p. 43). The study also showed that children retain information better when all their senses are involved in what they are learning. Smelling, seeing, hearing, and feeling the animals and the environment that they live in gives the children a stronger tie to the memory and it makes the lessons learned harder to forget (Kruse, 2010, p. 44). Overall, by getting children involved more directly with conservation efforts, they are more likely to retain the information and have a positive attitude towards conservation.

Around the world conservation programs are teaching children about the importance of conservation by having programs set in the animal's environment and allowing the children to learn in their own way through hands-on experiences in nature. Some examples of these programs are National Recreation and Park Association's (NRPA) Green Parks Green Kids program in the United States, Barranquillia Zoo in South America, Burger's Zoo in the Netherlands, and Kiwi Conservation Club in New Zealand. There are many components that a program embodies that constitute a successful and thriving program. Some of these criteria for a successful program include: having clear goals, having programs relevant to the local community, having direct contact between kids and the environment, maintaining the entertainment value of the program, and having age specific programs (Jacobson, 2010). These facets of conservation education provide a good way to help understand the current programs in Wellington in order to design effective conservation programs for the future.

2.3 An overview of organizations currently focused on conservation efforts around the world

Overall, it is clear that conservation is essential to keep ecosystems around the world unique and abundant (Pressey, 2007). In order to help maintain the environment, conservation organizations have begun to focus their efforts on preserving flora and fauna. However, it is

sometimes difficult for any singular organization to cater to all people in every way and solve problems on their own. Elizabeth Lank, an independent expert on collaborative working, found that having groups work together improves everyone's outreach, resources, and knowledge of each organization. While some organizations have broader missions and some are more focused, all organizations struggle, to some extent, to reach the audience they seek (Lank, 2005, p.1). For this reason, it is important for organizations to work together to achieve the common goal of reaching a broader audience. A single organization attempting to disseminate information about a broad mission will at some point lose the depth of the information. The broader the topic is, the more likely it is that the information will be shallow. For this reason, it is important to allow organizations to focus on one main interest in any given program, and to have organizations join together to achieve a larger goal of providing a broader program over time. In addition, "no single organization can be the best, the quickest, the most cost effective at everything" (Lank, 2005, p.1). An organization that tries to be all things to all people will not succeed well at anything.

Organizations that stay current and work with each other will thrive in today's competitive world. "This is a new strategic challenge: that of developing the organization ecosystem that has just the right components to support your aims, at just the right point in time, and then successfully maintaining that ecosystem's health and vitality" (Lank, 2005, p.2). By creating this ecosystem, organizations can learn a great deal from the others they collaborate with. These organizations could help each other reach the public audience they are trying to reach, and support each other's goals.

In the United States Richard Louv, an author and conservationist, created the Children and Nature Network (C&NN), which is an organization that strives to "create a world where every child can play, learn and grow in nature" (Children and Nature Network, 2014-a). The Network is working to create the New Nature Movement (NNM) to connect all people to nature and has already connected hundreds of nature clubs and organizations across the United States. The NNM has even become a national network with connections on almost every continent and is still growing. On their website they have created a beta database called the movement directory. On this directory every location that is part of the network can be found, and you can

search and find organizations near you. This database has over 1000 programs and their locations, websites, and contacting information are available to allow the user to find out more about the programs they research. This database also has star contacts so that you can contact them and have help finding a program that would be best for your location and your children's interests (Children and Nature Network, 2014-b). Connecting these programs is one of the goals of this network; connecting the world to help educate children about conservation. In addition to the database there is another beta site called C&NN Connect. This is a location where organizations and individuals can post videos, pictures, and comments interacting and connecting with each other. This site connects organizations with each other so they can look and see what other places are doing or work with others for ideas and suggestions. Creating this connection site allows organizations to share information and generate interest in their programs (Children and Nature Network, 2014-c).

An example of organizations working together towards a common goal in New Zealand is Nature Connections, located in Wellington. Nature Connections has created a relationship between Wellington Zoo, Zealandia, Staglands Wildlife Reserve, Pukaha Mount Bruce, Wellington City Council, Greater Wellington Regional Council, Nga Manu Nature Reserve, Harbour Island Kaitiaki Board and DOC on behalf of Matiu/Somes Island, and additional organizations that are added every year. Nature Connections holds three workshops a year where members of each organization will get together to share their stories and why they are passionate about what they do. The goal of these workshops is to leave participants with a better understanding of how all of them are working towards the same goals and how they can help each other achieve these goals. All of the staff members are trained using the power model, which creates a unified style so that all of the organizations can turn to each other when in need. These organizations can reach out to each other when lacking certain resources or expertise. In addition to this, there are members of the Nature Connections team that reach out to the member of the organizations to ensure that they are kept up to date as to what is going on with other organizations in the area. This connection and sharing of information ensures that each organization knows about any events or activities happening in the area, and can use this knowledge or reach out if they want to change or be part of it (S. Rusholme, personal

communication, February 18, 2015). This is one example of how organizations that work together can benefit from the shared resources and knowledge, and can help make these organizations stronger and more successful.

When these organizations work collaboratively, they can take more active care of the natural ecosystem in Wellington. One example of this is when an injured animal is found on Matiu/Somes Island or at Zealandia. Formerly there was not enough adequate resources or expertise on the island or at Zealandia to treat the animals themselves. Through Nature Connections however, they now can send the injured animals to Wellington Zoo's veterinary hospital, called the Nest, where doctors can take care of these animals properly. Another example is that the Botanical Garden staff is just beginning to advertise using social media, and they are able to consult the experts on social media from the Wellington Zoo. These experts have been working with the Botanical Garden staff and helping them create a network on social media to get their name out there and better known (S. Rusholme, personal communication, February 18, 2015). These example and many others show how these organizations are working together to better the community and achieve their goal to "protect, preserve and showcase the region's unique environment" (Nature Connections, n.d.). While each organization has its own focus and lessons they teach their visitors, Nature Connections in Wellington is a wonderful example that shows how these organizations combine their resources to focus on the protection of the ecosystem.

3.0 Methodology

The overall vision for the Kaitiaki Kids program is to connect conservation programs already in place around the Wellington area to give children a more in-depth education about all conservation topics. To help aid with the development of the Kaitiaki Kids program, we have identified key questions that addressed in the course of our project:

1. How might programs work together to educate children about conservation?
2. Are there gaps in conservation education for children currently and how might we improve those gaps within the Kaitiaki Kids program?
3. What conservation programs for children are currently out there?
4. What are conservation topics that children need and want to learn about?

In order to make this vision of the Kaitiaki Kids program a reality, our project goal was to develop a recommendation as to how the Kaitiaki Kids program could be structured by doing online research and interviews to find programs that already exist in the Wellington region, to establish what conservation topics children should learn about, and to determine gaps already in conservation education that the Kaitiaki Kids program could fill. We wanted to find gaps regarding conservation topics that are not currently being taught to children, but are important for New Zealand today, but also determine how to structure a new children's program in order to make it successful.

This ground breaking stage constituted part of Phase One of the overall development of the Kaitiaki Kids program; future phases, which will take place after we leave Wellington, will include organizing the information gathered, speaking to other organizations to get them involved, procuring funding, and setting the Kaitiaki Kids program into motion.

We have identified three major objectives to answer our key questions to accomplish our mission of the project:

3.1 Identify and assess programs that are currently involved with conservation efforts in the Wellington area

3.2 Assess expert knowledge about information pertaining to what constitutes as a successful children's conservation program

3.3 Develop recommendations and options for the Kaitiaki Kids program

3.3

3.1 Identify and assess programs that are currently involved with conservation efforts in the Wellington area

To find programs already active in conservation education, we researched online to find and gain information about programs in the Wellington area. Based on this research, we sifted through the information to determine the best programs from these organizations to recommend for a basis structure of the Kaitiaki Kids program. Information about the programs we found were obtained from the website of each organization. As a group we have found a total of forty programs that we considered, as listed in Appendix A and B, which we deemed a sufficient number in order to ensure that we obtained a wide variety.

When conducting our online research, we began by understanding the mission and goals of the organization and then researched the programs they offer. From these forty programs, we categorized the programs into groups that taught similar conservation ideas to help us look at each program more specifically. Once we identified programs, we needed some criteria that we could use to determine our recommendation of programs and therefore we sought to gain information from experts of conservation and education.

3.2 Assess expert knowledge about information pertaining to what constitutes as a successful children's conservation program

In order to propose an effective structure of the Kaitiaki Kids program, we needed to gain a thorough understanding of what constitutes as a successful program. To do so, we interviewed experts of conservation and education around the Wellington area.

These interviews took place on field trips that our sponsor set up for us to experience children programs and conservation. We had eleven interviews with employees from organizations such as: Wellington Zoo, Zealandia, Matiu Somes Island, Department of

Conservation, Catchpool Valley Park, Nature Connections, and the Wellington Museums Trust. The table found in Figure 3, depicts the people who were interviewed:

Name	Organization	Set of Interview Questions
Becky Wilson	DOC	Appendix K
Darren Van Hoof	Zealandia	Appendix K
Lynn Allen	Wellington Zoo	Appendix K
Terese Mcleod*	Maori Studies Victoria university	Appendix K
Emma Dunning*	DOC Ranger for Matiu Somes	Appendix L
Aristya Marzuki	DOC Ranger in training for Matiu Somes	Appendix L
Jo Greenman	DOC Ranger for Matiu Somes	Appendix L
Daryl Stephans	DOC Ranger for Catchpool Valley Park	Appendix L
Sarah Rusholme	Nature Connetction	Appendix M
Anita Anderson	DOC	Appendix N
Angelina Barns	DOC	Appendix N
*Sponsor of Project		

Figure 3: Table of Interviews

The people we interviewed were chosen because they had connections with our sponsors and were working for conservation organizations that have a large impact on conservation in Wellington. Although some of the people we interviewed were affiliated with organizations whose programs we researched for our final recommendations, these interviews were not used to help us determine whether or not these programs should have been recommended to be a part of the Kaitiaki Kids program. They were used to give us additional knowledge on what constitutes a successful program in general and determine the information stated above.

We gained permission to record each interview prior to conducting it. Since we talked with a variety of people with different backgrounds, we created four different versions of interview questions that can be found in Appendices K through N. After conducting our interviews, we transcribed the conversations in order to analyze them to determine common themes and patterns among the responses. We then had two other group members analyze the same transcriptions. Using color-coding, we highlighted quotes that embodied similar themes the same color, so that we could see how common interviewees talked about the same idea. The color-coding themes are outlined in the table found below in Figure 4.

Color	Useful for programs in development
Text	Organizations working together towards a common goal
Text	Getting everyone involved
Text	Conservation by stealth
Text	Resources
Text	Needs to be specialized and new
Text	New modules and programs are determined from a need
Text	Don't be afraid to fail, take chances

Color	Criteria of Successful Programs
Text	Action based
Text	Discover for themselves, critical thinking
Text	Positive messages
Text	Kids teaching kids
Text	Don't dumb down information
Text	Has children understand the need for environment

Color	Uncommon Conservation Topics
Text	Projects with long term goal
Text	Eradication of pests
Text	Rubbish
Text	Marine
Text	Schools

Figure 4: Table of Interview Analysis

The information obtained from these interviews assisted us on three tasks:

- To determine what constitutes as a successful program to help us suggest ways in which the Kaitiaki Kids program could be structured to embody these traits
- To determine what conservation topics experts find most important to educate children about to help us develop our recommendation of possible modules
- To determine criteria of a successful program to use as a basis for narrowing down the programs we researched into our final recommendation

3.3 Determine recommendations for possible ways in which the development of the Kaitiaki Kids program could proceed

As a final deliverable for our sponsors, we have provided recommendations pertaining to how the development of the Kaitiaki Kids program could be continued. These recommendations are based on our online research and our in-depth interviews with experts. Our final recommendations will consist of a possible structure of the Kaitiaki Kids program that will be determined from the online research and interviews we have conducted. Not only that, by identifying gaps in conservation education through our interviews, we will recommend ways in which the Kaitiaki Kids program could fill those gaps.

The final stages of our work consisted of a final presentation in a Department of Conservation building in Wellington to present our recommendations and the completion of our research paper that was submitted to our sponsors.

4.0 Findings

In this chapter, we outline the findings and the data analysis that was used to determine our final recommendations to help with the development of the Kaitiaki Kids program. Our objectives are outlined as follows:

4.1 Determine the most important conservation topics based on interview discussions

4.2 Use interviews to determine what constitutes a successful program

4.3 Identify gaps in children's conservation education

4.4 Determine resources organizations need to develop programs

4.5 Select programs for Kaitiaki Kids program

4.1 Determine the most important conservation topics based on interview discussions

We used the interviews to determine themes that conservation and education experts have found to be the most important conservation topics for New Zealand today. Some of these themes will be the modules we recommend to be included in the Kaitiaki Kids program based off of the common themes from the interviews.

Pest Control and Trapping

One recurring theme from our interviews and research is that pest control and trapping is an essential topic for children to know about in New Zealand today. In our interview with Darren van Hoof, an employee at Zealandia, he spoke about the importance of trapping. He stressed how it is important to determine how pests interact with the environment, to ensure that the native creatures of New Zealand remain unharmed. In explaining why it is critical to teach children about pest eradication, van Hoof said, "kids that are doing trapping now, they will be able to trap for the next eighty years or so". The hope is that when you teach a child a skill today, they will carry it with them and use it for years to come; eventually this should help achieve the goal of a pest-free New Zealand.

Bird Identification

Bird identification is one of the modules our sponsors originally suggested. Through our experiences we have noticed that being able to identify birds by sound or sight can be useful for the protection of these birds by enhancing children's appreciation of an aspect of New Zealand's unique ecosystem. One of the important criteria that we found when we analyzed our interviews was that children learn well when they have to discover things for themselves. Being able to find and name a bird is one of the best and easiest ways to discover something by oneself. Lynn Allan from the Wellington Zoo talked about how children in the zoo get the most out of a program when they can discover and explore by themselves. Jo Greenman, a ranger from Matiu/Somes Island, pushed that getting kids to see the connections between humans and everything else was a necessary step in getting them to understand the importance of animals and why conservation is so essential. Birds are part of New Zealand's heritage and are therefore even more important for children to know about them because they are what makes New Zealand unique.

Plant Identification

Similar to bird identification, being able to identify trees, vines, and other plants by sight enables people to recognize and appreciate native New Zealand plants. Emma Dunning, a ranger on Matiu/Somes Island and one of our sponsors, told us that when she was young she learned that she could eat a plant called supplejack and even now when she sees that plant, she gets excited and eats it or offers some to others. This kind of enthusiasm is something conservation programs try to achieve with the children that participate in their programs and is something that children should be encouraged to embrace. Lynn Allan talked about how when you take children out to the bush, "[children] slowly scrape off the leaves and when they find something… and going to the book and learning how to identify [plants]… they enjoy that". She stressed how plant identification can be very interesting and exciting for kids especially when looking in a small area.

Marine Wildlife Protection and Water Safety

Living in New Zealand, people are surrounded by water and also all the animals that live and share the water with them. Many of New Zealand's marine animals are falling in number

due to pollution and other factors, as described in our background chapter. Some of the interviews with Matiu/Somes rangers identified that marine wildlife protection is one of the important topics to them, and lack of protection can lead to a devastating effect on the animals who live near their island. For example, throughout our time on Matiu/Somes Island, we were able to volunteer with a beach clean-up, to help protect the penguins and other sea birds.

Not only is the protection of the marine wildlife important, but also teaching children about water safety is a topic that came up in our interviews. Angeline Barnes of DOC states that "New Zealanders love swimming in our rivers and that's part of our DNA… And we also believe that water is quite easy to connect people to because it resonates with everybody because we all, no matter who you are, need water". Since New Zealanders have easy access to the water around them it is important to teach them how to protect themselves in the water, as well as the marine wildlife around them.

Outdoor Health and Safety

Outdoor health and safety is a program that was suggested by our sponsors and is considered a very important conservation topic because it focuses on teaching children about being safe when in the wild. Emma Dunning said, "I've always had an interest in ... being able to be safe... and [having things] help you survive in the wild". It is an important topic, especially for our sponsor, and for anyone who is inclined to the outdoors or even those who are not. Anita Anderson said "so that's the challenge for us, talking about the bush, because for some people, that's quite remote". It is critical to educate people unaccustomed to the outdoors of the safety measures so they will feel more comfortable to go outside and experience nature in a safe and positive way.

Plant and Wildlife Protection and Restoration Programs

A theme that consistently came up in the interviews was returning the environment to its original state by planting and reintroducing native species, while working to remove invasive species. Jo Greenman talked about how planting is an important part of bringing Matiu/Somes Island, where she works, back to its original state. By planting native plants and protecting the native animals, kids learn about the natural history of New Zealand, as well as learning about

plants and animals that they should take care of and be aware of in the wild. Darren van Hoof, an employee at Zealandia, asserted that while it is beneficial to educate children about conservation, "the main end goal is to improve the environment". Childhood education is just an effective means by which to achieve this. A protection and restoration program helps children understand the value and history of their country and learn about the animals and plants that still thrive in New Zealand.

Water Pollution and Waste Management

Water pollution is a topic that Emma Dunning, a ranger on Matiu/Somes Island, finds to be very important, specifically to the New Zealand people. Dunning talked about "making people realize that learning about other things like rubbish and composting is actually … part of [conservation]." There are benefits to having kids understand the dangers and waste of rubbish, since living near trash and pollution is unpleasant to all living creatures. Daryl Stephens, a ranger at Catchpool Valley park, stated that "People have no idea what happens to their rubbish or their sewage or why they need to recycle. Why they need to reduce their use of things, so education about that side of things is a really good idea". It is clear that water pollution is a critical topic that children should learn about. Emma Dunning even talked about how "when you actually start talking to them [children] about their ocean and what is plastic, it's like 'hm that's actually quite interesting'". According to Emma, with that interest, some of the children get very excited and tell their parents about the harms, and that they should be helping by not buying things that are a one-time use product.

There was a program called Take Action for Water where people went into schools to talk about water issues. The Take Action for Water program is no longer running because funding for it dried up and the people who went into the schools could not be paid. There are currently no other water related organizations in Wellington that we could find.

Climate Change

Climate change is an important topic to know about in this day and age because it is affecting us now and will affect people more in the future. Angeline Barnes stressed that

> the real world is going to take decades to see the improvements due to our actions, but...to give children that confidence, that reassurance, that actually you're seeing…that your impact by turning the lights off, is making a difference…hang in there kids, you can do it, you can have an influence on that, you can solve the problem.

To add, Sarah Rusholme, from Nature Connections and the Wellington Museums Trust, also agrees that climate change is important for children to learn about and be involved in, as it is a growing issue.

Māori Culture

Another topic that was mentioned in a couple of our interviews was incorporating a Māori Culture module into the Kaitiaki Kids program. Indigenous learning styles may differ from how non-indigenous children are educated, but has been found to be successful for all children. In addition to the learning style, the Māori culture is an important topic for children to know about. The culture has been dying out since the early twentieth century when the Europeans took over the land and tried to rid the country of the Māori culture. The Māori renaissance of the 1970s helped begin to revive the culture, but it is still gaining support. Daryl Stephens stated that, "they're conserving the language. People are sort of forgetting about Te Aro Māori, and educating them in that way. Just a few words goes(sic) a long way, to helping people feel like they're actually learning something". It is important to teach children about the Māori culture because it is unique to New Zealand and really helps bring back some of the beliefs that were almost lost so many years ago.

4.2 Use interviews to determine what constitutes a successful program

By interviewing eleven experts in conservation and education, we found themes that they feel characterize successful programs that would be useful for our sponsors to know when developing the Kaitiaki Kids program. As explained in the methods chapter, when going through the interviews we highlighted ideas that came up more than once, and used these ideas to further our understanding of what a program, like the Kaitiaki Kids program, would needs to be successful.

Organizations working together

A common theme among the interviews we conducted was that organizations generally have a higher rate of success when working together towards a common goal. Through sharing people, ideas, and resources, organizations can learn very important information from each other and succeed more than trying to cover a wide range of topics by themselves. Lynn Allan from the Wellington Zoo said, "[The zoo] is looking at the planting and then Zealandia is looking to get rid of the pests from that area. So there are really elements where they really complement each other." Although each organization has a different core focus, when they work together they create a stronger push to help the environment, rather than provide overlapping efforts. The Wellington Zoo teaches children to love their ecosystem and how to plant native plant species to help it flourish, through programs like that of Bush Builders, whereas Zealandia teaches them how to trap invasive species to protect the plants and animals that are native to New Zealand. The Wellington Zoo and Zealandia are both partners in Nature Connections, an organization described in the background chapter, which focuses on allowing different organizations, such as these, to join and share resources and ideas. By working together, these programs provide children with well-rounded ideas about how to bring New Zealand back to its natural state and how maintain it. Although there is not a formal arrangement between the two organizations to teach children about these specific subjects, both organizations realize that providing complimentary programs is beneficial.

Getting everyone involved

Another topic that came up in our interviews was that conservation programs are more successful if they include not just the child, but also their entire family. Emma Dunning, a DOC Ranger on Matiu/Somes Island said in an interview, "so that's ...the message to take home, the behavior changes…ensuring that kids and therefore everyone around them has sparked that interest to [make an impact] in their lives".

A study by Cara Kruse, an educational specialist at the Busch Gardens Zoo, showed that children involved with hands-on work not only learned and remembered better, but their attitudes and behaviors improved as well (Kruse, 2010, p. 43). When a child learns a lesson and is excited about it, they bring it home to teach his or her family about the lessons which are then passed

throughout the family. This leads to people being more aware of the issues around conservation and helps them gain the tools needed to solve conservation issues. One of the many goals of conservation organizations is to help spread awareness of what is going on in the environment around them and children are able to help spread this in a way that many organizations are not able to do themselves.

"Conservation by stealth"

Many of our interviewees explained how one of the best ways to teach children is to create a conservation program where it is structured so that they do not realize they are learning. Lynn Allan said in an interview that the focus of an education program for children should be "conservation by stealth. Kind of just making it about... fun and enjoyment of the activity". By creating an activity that children will enjoy taking part in, they will learn more even when they do not realize it. Angeline Barnes added that "engaging without realizing they are engaging" is an important way to learn, and stressed the need for fun based programs. Creating a conservation program where children get to play games or solve a puzzle that they enjoy will allow children to learn much more than if they are learning from a book in a classroom. Teaching by action has proven to be much more successful than teaching in a classroom for getting kids to retain the information taught.

Children learn well by completing an action

The majority of interviewees agree that children need to do something hands-on in order to solidify the message they are being taught. Lynn Allan of the Wellington Zoo asserts that "everything has to have a 'why' to it...there always has to be some kind of outcome [to the action a child is completing], and it has to have taken them on that journey". She goes on to describe building lizard lairs or small simple habitats for the reptiles of the zoo. She believes it is beneficial to have children "build something like that, that they can go and monitor over time", such as a habitat for an animal that they are interested in. Darren van Hoof of Zealandia agrees with Allan's assertions, saying that there should be a push in schools to make conservation more about action and less about lecturing. One of the ways that Zealandia is currently having school children be hands-on is by having an application on tablets that allows kids to take pictures of the animals or animals they see and put them on the internet as well as letting them have a record of

what and where they found the animals or plants. This application is called Nature Watch and is used all around New Zealand, not just in Zealandia.

Children learn well when they make their own discoveries

Another common belief among the professionals we spoke to was that children learn more when they are encouraged to come to their own answer, rather than simply being told information. Darren van Hoof says that it is best to "give [children] the information and let them [draw conclusions from it], because telling people never works, and...unless [one] experiences it or make up his own mind then it doesn't really matter". Lynn Allan of the Wellington Zoo says that children seem to enjoy "being able to figure all the information out themselves...that's definitely beneficial".

Sending positive messages about conservation is important

Many of those with a passion for conservation agree that it is important to focus on the positive aspects of conservation rather than the negative. The goal of the Wellington Zoo, according to Lynn Allan, is to teach children to love nature and to get excited about conservation, rather than focusing on the negative aspects of conservation: that "all the animals are becoming extinct and we have to do this and we have to do that". Giving conservation a negative connotation turns people away from it, and makes them less willing to do something to help. Angeline Barnes supports this by saying that most people understand the negatives, but it's important that we focus on teaching the children the positives.

4.3 Identifying gaps in children's conservation education

Through our interviews, we discovered areas that conservation and education experts feel are lacking in environmental efforts in the Wellington region. The main gaps outlined in the next few sections include: outreach to young audiences, programs that last longer than day, broader approaches of teaching children about conservation, action-based programs, and program integration with schools.

Outreach to young audiences

Many organizations struggle to reach out and successfully inform young audiences about the programs they offer. Jo Greenman, a DOC ranger on Matiu/Somes Island, talked about the need of "outreach programs that actually go and target [children] as a valuable audience." She said that this is the problem that Matiu/Somes Island currently deals with. Even though nature is all around them, children do not know where or how to get involved in conservation and so they do not. In addition, there is a lack of understanding of how to target and interest children by those in the field. Programs have created advertisement for parents, but then have forgotten that the children are the ones taking part in the program.

When looking at many programs, it is evident that most of the information on programs is tailored to attracting the attention of parents. For example, in the events section of the Kiwi Conservation Club website, the first section talks about the restrictions for the events. This is primarily for parents to read through and summarize to their child if they found it to be interesting. The DOC Kiwi Ranger booklets are a fun resource for children, but it is usually a parent who has the ability to obtain the booklet from a ranger, usually at a visitor's center. Though both of these programs are well known, they may be held back by not targeting children directly through their marketing. However, there have been organizations that have tried to advertise to the children, but by not understanding children, they have lost the children's attention and the parents as well.

Anita Anderson and Angeline Barnes from DOC talked about how it is hard for them to figure out how to do outreach to children because adults do not really understand children. They have found that sometimes the children do not take the information the way that was intended and that the children will not gain interest or want to get involved. As conservation organizations become increasingly well known, more children will be able to take advantage of the resources available to them. The Kaitiaki Kids program is being designed partially on the idea of getting the programs associated with it more known. Angeline Barnes says that in doing so, they hope that children will go out and do more and tell their friends to go with them. This would help children to know more of the many options that are currently out there.

Another goal of outreach is to appeal to people who are of different ethnicities and different economic standings in order to overcome inequalities of access to conservation programs. These inequalities exist for a variety of reasons, including a lack of money to participate in such activities, not having a means of getting to these activities, or so on. Anita Anderson said “blending in things that [children] can do at home or in the schoolhouse, so not everything is having to go somewhere”. Angeline Barnes continued with “so kids can still participate. So that the children who doesn’t have that resource, you’re not passed over because you don't have a mom who has a car who can drive you to the places”. These people are often less likely to know about organizations or get involved for various reasons; this is therefore something programs should take more action in doing.

Long-term programs

Long-term programs are known to help children not only remember more about what they are learning, but also to get them more involved. Lynn Allan spoke about the need for long-term projects, saying that you need to create some way in which participants are encouraged to keep using what they have learned from a program, even after the program has ended. An example of this is at the Wellington Zoo where the children can create a nest box, where they must continually fill and maintain the bird feeder. This requires them to visit it on a regular basis, allowing them to see the different types of bird that are in their backyard. This is considered a long-term program because the child will hopefully take care of it and remain interested for more than one day. In contrast, when describing a year-long program called Bush Builders, in which children go out and plant native flora to rebuild New Zealand’s bush. Allan considered this one-year program to be a short duration for a conservation program because Bush Builders lacks a deliverable that goes on past the culmination of the project.

Broad approach

Another gap in conservation efforts discussed in our interviews was that of an all-inclusive, wide-angled approach. We have discovered that there is too much specialization in conservation topics through our online research. Emma Dunning talked about how “help[ing] with ... conservation is more ... than just the plants and animals”. Jo Greenman supports the idea by adding that everything is connected and that children need to understand how they connect to

all aspects of conservation and how they can make a positive impact. It can be difficult for a single organization to have a broad focus on conservation for a variety of reasons including, financial issues and a lack of staff, as well as procuring resources for each topic. Additionally, programs must be kept up to date; the broader the scope of a program, the more time and effort it takes to keep it current. Jo Greenman spoke to this point when describing what resources she would need to implement a conservation program, saying, "as the national curriculum changes, [an educational resource] needs to be able to keep up with it. So I guess that comes back to the staffing. There needs to be an annual review of that source to check that it is still in line". The Kaitiaki Kids program aims to bring together many specific conservation topics into one broad program; the program focuses on the importance of educating children about more than just one significant conservation topic, but all of them in order to provide an opportunity for children to gain a broader knowledge of all conservation topics.

Action after program

Darren van Hoof, of Zealandia, said that "[conservation] just needs to be about action". He believes that the biggest gap in conservation is not having an action that is the result of the learning experience. Such an action could be something like building a lizard lair or a penguin nest box, where the child can check back and monitor it over time. It could also be a lesson that they take with them and can incorporate into their daily life, such as a skill they learned during the program. There are programs designed for children to participate only for a short amount of time. These children could leave and maybe remember something that happened, but if not, it was just a day camp for them. This is why it is important to supply deliverables for the children to work on beyond the program itself. Deliverables, being something that the children built or create or even a booklet of activities to complete, are useful because they solidify the lessons learned in the child's mind. If they have to go check their tracking tunnel or fill out a crossword puzzle about what they had learned that day, then they will be remembering the material more

From a report about children's learning by Dr. Brigid Barron and Dr. Linda Darling-Hammond of Stanford University they state "research suggests that inquiry-based learning demands thoughtfully structured performance assessments to define the tasks students are engaged in and to properly evaluate what has been learned" (Barron, 2008, p. 3). Having an

assessment or a deliverable after an activity or lesson helps students solidify what they have learned. Our interviewees suggest that the knowledge obtained from the program needs to continue afterwards and that can be achieved by having deliverables.

Schools

Another gap that was discussed many times within our interviews was that schools had a hard time integrating pre-formed conservation programs into their curriculum. Jo Greenman explained, "teachers … can't pick up something no matter how fantastic it is unless it is one of their criteria. So it is really important to match the resources to the national curriculum". That is, although teachers in the public school system have the ability to teach conservation where it is relevant within the curriculum, they do not have the time to adapt the curriculum to cover conservation topics unless there is material available to them that is already tailored to the leasons they need to cover within the school year. Currently conservation is not successfully integrated into the national school curriculum. As described by Angeline Barnes,

> many [New Zealanders] who have undergraduate degrees then just go and do a one-year conversion degree...to then become teachers. There are only...[a few] hours out of that one year course that are attributed to learning about science and only a portion of that is environmental science. So the support we are giving out teachers in training is really not helping to embed environmental education throughout classroom life.

Although teachers do not necessarily have much training with environmental sciences, teachers can make use of prefabricated conservation programs to aid with their lesson plans. Our interviewees discussed that by working directly with the teachers to create such programs, they can determine ways to incorporate conservation into lessons they already teach within their curriculum.

Although many of our interviewees stressed the need to incorporate conservation into the school curriculums, there are some difficulties to consider. When discussing the costs for a school to have field trips, Sarah Rusholme stated that "[the students have] never been to museums [Wellington, sea, etc] and they're just living up the road, but that barrier is so big that

for some teachers it's just insurmountable". It is extremely difficult for teachers to coordinate field trips due to the number of students, budget, and restrictions on transportation. Angeline Barnes also warned us of the difficulties and issues of incorporating conservation programs into schools. She told us "as far as your program [goes], don't fall into having a ranger …go to classrooms as part of the talks, because they won't get any funding for it. It's not sustainable". Take Action for Water is an example of a program that was unsustainable for this reason. It was mainly based on having DOC rangers go into school and lectures, as Angeline described, and because of this, the Take Action for Water program lost interest and funding. The cost of providing the resources exceeded the benefits reaped from the program, rendering it unsustainable.

However, in another interview, Barnes said "there are definitely opportunities in after-school...A module that could be afterschool world would be well received". As teachers are already utilized after school for various clubs and sports, incorporating another afterschool program could be conceivable. Additionally, an afterschool program could also be more accessible for children than a program that they attend on their own time. Many children may not have a way to get to a separate program, such as parents who have time to provide transportation. An afterschool program could allow more children to take part.

4.4 Determining resources organizations need to develop programs

One of the questions we asked our interviewees was what resources would be needed in order to accomplish goals they have regarding conservation. The most common response received was the need for people. Some of the overarching comments from our interviews regarding the need for people when developing new programs were:

- The need for more people designing and delivering educational materials
- Access to people who know about conservation
- Having access to people with dedicated time to guide and provide support to parents
- People who want to be educated and do work
- People to be trained and go to schools to talk prior to children's participation in the programs

- People with the energy and enthusiasm who can successfully communicate with children and get them engaged

Every one of our interviewees talked about the need for getting more people involved in conservation efforts. Darren van Hoof talked about getting children involved to relieve some of the stress of finding volunteers. He described how Zealandia was training kids to be guides and stressed that children are just as capable as adults and that this resource should be utilized more often. Another resource that would be beneficial for the development of a program is having money for materials such as: staff, materials for hands-on activities, and educational materials. Developing a new program requires substantial people and resources in order to be successful.

4.5 Selecting programs for the Kaitiaki Kids program

Through our interviews we have determined criteria of successful programs and what conservation topics are important for children to learn about, as mentioned throughout the findings chapter. In order to determine our final recommendation of a possible structure of the Kaitiaki Kids program, we used this information gathered from these interviews to develop our program analysis, as shown in Figure 5.

Module 1				
Program Name	**Program 1**	**Program 2**	**Program 3**	**Program 4**
Hands-on and Activity Based			X	
Outdoor Activities	X	X	X	X
Critical Thinking Skills				
Deliverables Short or Long Term				
Length of Program More Than a Day	X		X	
Educational	X	X	X	X
Parents Involved				
Program?	Yes		Yes	No
School Program?			X	
Online?				
Comments				
Total	3	2	4	2

Figure 5: Table of Program Analysis

The analysis of each program can be found in Appendices E through J. The left row lists the criteria of successful programs based on our interviewee's opinions. The criteria of a successful program are:

- Having hands-on and action based programs
- Getting the children connected with nature by having outdoor activities
- Enhancing children's critical thinking skills
- Having positive messages about conservation
- Having deliverables that the children take home or develop themselves
- Having a program that lasts for more than just a day
- Having an educational program

The top column lists the programs that fit within each module type. We grouped the programs into categories of the most important conservation topics from our interviews, which determined our modules. We then used the criteria of successful programs from our interviews to narrow down our list of forty programs to our final recommendation. Within each module grouping, we looked at the programs to see which criteria each program embodied. The programs that consisted of the most criteria of a successful program were the programs we kept for our final recommendation and are described in the following chapter.

5.0 Conclusions and recommendations

The final conclusions and recommendations outlined below are to help with the development of the Kaitiaki Kids program. These recommendations are based on conclusions drawn from our background research, online research, and interviews. Our conclusions and final recommendations are:

5.1 The finalized list of programs

5.2 Creating new modules and programs

5.3 Our recommendation for partnering with schools

5.4 Having outreach opportunities

5.5 Researching further into possible benefactors and patrons

5.1 The finalized list of programs

Currently we see the initial Kaitiaki Kids program consisting of six modules that the participant must complete to eventually graduate as a Kaitiaki Kid. These modules each have a specific conservation focus, such as bird identification, outdoor health and safety, plant identification, water safety, etc. Each module consists of a series of programs from other organizations already in the Wellington region relating to the module's overarching topic, to be completed to earn some sort of measure of achievement within that topic, such as a badge. We hope that having conservation organizations working together and connected through the Kaitiaki Kids program, it would raise awareness of their organization in order to help support their cause and also give children a well-rounded education about conservation.

By recognizing common patterns and themes among the interviews, we were able to determine six conservation topics for modules that are relevant to New Zealand's environment today, most beneficial to children, and most interesting to children. Having coded the transcriptions of these interviews allowed us to find these patterns by understanding what experts view as important conservation topics for children to learn as well as what topics are lacking and should be taught to children.

For each of the six modules, we suggested existing programs based on our program analysis that pertain to the topic of the module that we believe would be effective in teaching children about the topic. In total, using our program analysis we narrowed down our total list of forty programs into a final recommendation of fifteen programs. We sought to vary the type of activity within each module, for example by including one online activity, one nature walk, and one hands-on experience at a local organization in order to have a module that gives children a well-rounded education about conservation.

Out of the forty programs we found through our online research, some required the participants to be a part of school groups. We decided to not include these programs into our final list, because the Kaitiaki Kids program has not yet been fully structured and we currently see it being developed as a standalone program first, before being incorporated into schools. In addition, the school programs require a group and one of the Kaitiaki Kids programs' goals is to allow any child to get involved, no matter how they would like to engage with the program. However, we still researched the school programs in the area, as this information could be useful in the future. We have provided the information about these programs to our sponsors in Appendix A, in case they wish to research them in the future, but have not included them in our recommendation since our focus was not on incorporating the Kaitiaki Kids program into schools.

As all of our information about what each program entailed was from online websites, we understand that this information may not be an accurate representation of what the program actually is. We would have liked to discuss the programs we researched with each organization, but due to the scope of the project, we did not have the time. Our sponsors also asked that we did not discuss the Kaitiaki Kids program to other organizations because it has yet to be fully developed. Therefore we recommend that our sponsors talk with each organization to ensure that each website depicted the program accurately.

Below is the list of our final recommendation of the six modules and fifteen programs to be a part of the Kaitiaki Kids program, followed by a description of each module.

- Pest Control and Trapping

    - Sleepover Program at Zealandia
    - One Hour Tour at Pukaha Mount Bruce
- Bird Identification
    - Online Bird Identification Website from The Kiwi Conservation Club
    - The Nga Manu Nature Reserve
    - Exclusive Behinds the Scenes Tour at Pukaha Mount Bruce
- Plant Identification
    - Botanical Garden Tours
- Marine Wildlife Protection and Water Safety
    - Seal Coast Safari Tours
    - Our Marine Exploration Programmes Explore, Discover, Learn! at Island Bay Marine Education Centre
    - WhiteBait Connection at the Wellington Marine Conservation Trust
- Outdoor Health and Safety
    - The Outdoor Safety Code at the New Zealand Mountain Safety Council
- Plant and Wildlife Protection and Restoration
    - The Rimutaka Forest Park Trust
    - Junior Rangers at Pukaha Mount Bruce National Wildlife Centre
    - Exploring Nature With Children Booklet from the DOC Website
    - The Conservation Challenge at the Wellington Zoo
    - Matiu/Somes Island

Pest control and trapping

Out of the forty programs we found, four focused on pest control and trapping. We decided to choose only two programs, mentioned in the list above, as we felt these programs balanced each other and would be very educational for this topic. For balancing, we looked at the

length of each program because they showed similar criteria and were all strong, well-developed programs. Zealandia offered a two-day sleepover program and Pukaha Mount Bruce offered a one-hour tour and therefore we felt these two would create a good balance of length.

Bird identification

Out of the forty programs we found, eight focused on bird identification. Given the large number of programs available and the importance of this module based on our interviewees' opinions, we felt having at least three programs would be necessary. Looking at the number of criteria the programs met, we chose the Nga Manu Nature Reserve and the Exclusive Behind the Scenes Tour at Pukaha Mount Bruce initially as we felt they embodied many criteria of successful programs. Both of these programs are outdoors and educational and therefore we wanted another program within the module that was either online or fun-based to create a balance between all programs within the bird identification module. Therefore we chose the Online Bird Education program from the Kiwi Conservation Club website. We had two options for online bird programs, but the Kiwi Conservation Club's program included more bird identification options and was designed specifically for children compared to DOC's online program. Lastly, we chose the Night Adventure Tour to be an alternative, because it is a strong program but is located in the same place as the Exclusive Behind the Scenes Tour. We do not want to have too many programs from one organization as that may take away from a balanced experience.

Plant identification

Out of the forty programs, two focused on plant identification. This module is one of our smaller ones as there were not many programs in the Wellington area that focus primarily on plant identification. This presents a gap that our sponsors may want to consider and is discussed further in our following recommendations. Out of these two programs, we chose the Botanical Garden Tours as it is located in central Wellington, is educational, and is an outdoor tour. The Children's Garden has not yet been developed in the Botanical Gardens and was not included in our recommendation. However,if the garden is created and proves to be as informational as they have advertised it to be, we feel that it should be incorporated into the Kaitiaki Kids program as it will be very hands-on for children.

Marine wildlife protection and water safety

Out of the forty programs we found, ten focused on marine wildlife protection and water safety. There were many great programs that were focused on marine wildlife and protection, but many of them require school groups. Since we are not considering these programs for our final recommendation, we still wanted to analyze them and chose one that we felt should be incorporated into the module in the future if the Kaitiaki Kids program partnered with schools. The school program we chose was the Wellington Marine Conservation Trust-Octopus Club Experiencing Marine Reserves as it embodied the most criteria of a successful program. For the three programs we chose, as listed above, we picked these as we felt they had a strong balance between fun and educational as well as outdoors and indoors and that involved the parents.

Outdoor health and safety

Out of the forty programs we found, one focused on outdoor health and safety. This was a module that our sponsors recommended to be a part of the Kaitiaki Kids program and was a topic some interviewees brought up as being important for children to learn about. Currently in Wellington there are not many programs that focus strictly on outdoor health and safety. The Outdoor Safety Code at the New Zealand Mountain Safety Council was the one program we found. This is a very strong program that had many of the criteria we identified and therefore we have chosen the Outdoor Safety Code program for this module.

Plant and wildlife protection and restoration

We found fifteen programs focused on plant and wildlife protection and restoration. Given the popularity and importance of this module, we decided that having more than three programs would be crucial. This module focuses on the general protection of New Zealand's plant and wildlife and is an important topic that our interviewees stressed. From our criteria, it was clear that seven programs were considered more successful than others based on the number of criteria those programs met (that met at least five criteria). We therefore wanted to recommend these programs for this module. As there were many programs to choose from, we decided to include backups incase the programs we recommend are unable to become a part of the Kaitiaki Kids program.

5.2 Creating new modules and programs

Once the Kaitiaki Kids program is fully developed and successful, it will have a basis to grow upon. Some of our recommendations are to create more modules on a wider range of conservation topics, and to work with organizations to create new programs to fill the gaps within these modules.

In the current state of conservation education programs in Wellington, we are suggesting six modules in this report with no more than five programs per module, based on the programs that we have found and deemed strong. In the future, we believe that as the Kaitiaki Kids program becomes better formed, it should become an organization with full time employees who are able to dedicate their time to the improvement and organization of the Kaitiaki Kids program. A couple of these possible module topics that arose in our interviews were conservation related to water pollution and waste management, and climate change.

Water Pollution and Waste Management

Water pollution has been proven to negatively impact humans, animals, and marine plant life. It is essential that children understand the negative impacts they can have on the marine life, but to also learn of the positive impacts they can make to protect the unique ecosystem by focusing on waste management and reducing water pollution. As stated on the eSchoolToday website, water pollution has the biggest negative impact on the aquatic animals (eSchool Today, 2015). Additionally, the Department of Conservation states that "as much as 80% of New Zealand's indigenous biodiversity may be found in the sea" (Department of Conservation, n.d.-h). It is therefore clear that children need to understand the impact water pollution can have on that indigenous marine biodiversity, in order to help preserve the uniqueness of New Zealand by making a positive impact.

A program that was created in on the Long Island Sound in the United States of America is an example of a successful program about how children can get involved in water clean ups. This program was called Kids Explore! Kids Do! Kids Teach! This program had three parts to it. The first part, Kids Explore, was where the students took a canoeing trip out to the river and had hands on lessons about water pollution. The second part, Kids Do, has the children plan and

carry out three community service action projects; a cleanup, a game to help educate the public, and a “pick me up” mailing party to send out post cards the children designed to help educate people about water pollution. For last part, Kids Teach, the group of children held a public forum to teach friends and family about what they had learned and accomplished (Barnes, 2007). We believe that the Kaitiaki Kids program could create a program like this in Wellington to help get children involved and educated about water pollution

Climate Change

The Ministry for the Environment states that climate change can have negative and positive impacts on New Zealand in the future. It is important for children to understand the effects of these impacts in order to be better informed and prepared. Some of the effects, as outlined on the Ministry for the Environment website, include higher temperatures, extreme weather (which could include droughts and floods), and a change in rainfall patterns (Ministry of the Environment, 2014); these effects can have an impact on flooding, water resources, health, biodiversity, transportation, businesses and finances. As climate change can have an impact on many aspects regarding New Zealand and the entire world, it is important for children to understand climate change's impacts.

An example of a successful program that teaches children about climate change is the National Aeronautics and Space Administration (NASA) Climate Kids program. Climate Kids is a NASA website geared towards children, on which children can play games that teach them about climate change and its effect on the earth. Additionally, the site offers printable activities so that the child “no longer needs to be connected to a computer to have a fun, educational experience” (Climate Kids, 2015). When seeking to create a module relating to climate change, the Kaitiaki Kids program could base this new module around a program like this.

Māori culture

We found that there are no programs for children in New Zealand that incorporate Māori beliefs and teaching methods into conservation education. This will be what makes the Kaitiaki Kids program unique, it that it will fill this gap. This module, however, will be developed by our sponsors and a team of Māori experts in future stages of developing the Kaitiaki Kids program.

Adding programs to modules

It would benefit the Kaitiaki Kids program to have more programs within each module. The modules focused on outdoor health and safety, plant identification, and pest control and trapping, that we are recommending, do not have many programs related specifically to those topics in the Wellington area. However, based on our interview discussions and our online research these are important modules to have. There may be programs that touch on these topics, but there are not many that have these as their main focus. Therefore we particularly suggest that more programs be developed for these modules to make them well-rounded.

Though creating partnerships and establishing credibility, the Kaitiaki Kids program will gain relationships with many organizations, which will lead to the ability to give ideas about programs that could be created to add to modules. Open discussions with the organizations about conservation education will help gain a mutual support between these organizations and the Kaitiaki Kids program. The Kaitiaki Kids program will bring more children to these organizations, and in return these organizations will help make and maintain the best programs to keep the modules strong. This mutual agreement is for further development of the Kaitiaki Kids program, when it has already established itself as a strong program and beneficial to those who take part.

5.3 Our recommendations for partnering with schools

Through our interviews, we noticed a common topic that was brought up in each discussion: schools. As discussed in our findings, incorporating conservation into school curricula is a work in progress and is something many conservation experts find to be important for environmental efforts today. One of the goals of incorporating conservation into school curricula is that it could create a social norm and resonate throughout their lives. As we currently see the Kaitiaki Kids program being structured, it would be difficult to fit into a school curriculum because it is made up of many programs from other organizations. In addition it could cost the school an excessive amount of time and money to transport all of the children to the different organizations to take part.

However, we recommend the Kaitiaki Kids program be incorporated as an afterschool program. Having the Kaitiaki Kids program as an afterschool program could still produce a similar outcome as a program during school, for it will still be able to teach the children, but with less disruption from the required lessons and less restriction on travel. To initialize the Kaitiaki Kids program as an afterschool program, teaching manuals would have to be created so that a teacher or adult could successfully organize and lead the children. In addition, for the Kaitiaki Kids program to adjust to the larger groups, the organization's programs would have to be modified and potentially get additional funding to be able to support the greater number of participants. In addition there are many programs that were not considered for the standalone Kaitiaki Kids program, for they were created for school groups. These could now be added to the program.

It is thought that creating a standalone program first will help improve the program and make it easier to determine how to make it into a successful afterschool program. In the discussions with our interviewees, it was brought up that although it is important to have conservation in school curricula, it is still important to have standalone programs in order to allow access for those who wish to participate.

5.4 Having outreach opportunities

It is important to get children to participate in the Kaitiaki Kids program and to do this they must first know of the program. As talked about in the findings section of this report, going straight to the children when advertising is a successful way of gaining the interest of children and have them wanting to get involved. We recommend that researching into how other programs have marketed their program or how they have outreached to children, in order to look at how the Kaitiaki Kids program might do the same. Another recommendation is to spend some time interviewing children in order to understand their views. This could be obtained through focus groups and interviews, though it will still take a lot of time and effort, but could be vital for the Kaitiaki Kids program to succeed. Finally, we also recommend that our sponsors look into gaining support for the Kaitiaki Kids program by partnering with schools or other organizations.

5.5 Researching further into possible benefactors and patrons

Though our research we have come up with a list of possible benefactors, as shown in Appendix C, that could help fund the Kaitiaki Kids program. There are many different ideas of how the Kaitiaki Kids program could be supported. Those who take part in the Kaitiaki Kid program could possibly pay a start up fee or each person might pay for only those programs that they participate in. We want to make the Kaitiaki Kids program as accessible to as many children as possible, so we are hoping that we could find a corporate benefactor, to help lower the cost for those who would want to take part.

We have looked up benefactors of conservation organizations through our online research, for these companies already support environmental causes. These are not the only companies that will be considered, for they are already funding some sort of organization. However, these organizations and ones like them appear the type of benefactors that Kaitiaki Kids program will need. These benefactors are important to help bring down the cost of the program to those who join it, as well as give funds to help initially advertise the program to the public. In addition, making sure that the organizations that agreed to partner with the Kaitiaki Kids program, feel financially secure.

In addition to benefactors, the Kaitiaki Kids program might also benefit from having a patron, or figurehead, for the program. There are many programs that have a famous patron to help advertise their organization or program and help support their cause. Some examples of these would be Tahi, the one legged kiwi at the Wellington Zoo, or Sirocco the kakapo for the New Zealand Kakapo Recovery Programme. A patron could be anything from an animal to a famous celebrity, someone to endorse the program that will attract the attention of the pubic and create an image for the program. We have created a potential list of possible patrons, as shown in Appendix D, that could help advertise the Kaitiaki Kids program. We created a list of possible patrons from the organizations we have researched that already represent conservation programs to make sure our program does not replicate them, but to also help give some ideas as to what the Kaitiaki Kids patron could be (See Appendix A).

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Appendix A: Database of organizations and programs

Program	Description and Website Link	Target Age	Module	Pros	Cons
Pukaha Mount Bruce Night Adventure	Led by staff, visit Tuatara, kiwi house, movies. Listen to birds and identify. Explore forest, feel eels, glowworms http://www.pukaha.org.nz/	6+	Nature	-Many Options -Fun -Well Developed	-Outside city - Educational?
Pukaha Mount Bruce Day Education Visit	Ranger guided tour http://www.pukaha.org.nz/	Children	-Forest Restoration -Predator Control	-Rare Bird Species -Fairly Cheap	-School Needed
Pukaha Mount Bruce School Sleepover Visit	Personal Ranger Guided Tour of aviaries before dark, night adventure, wake up for morning chorus http://www.pukaha.org.nz/	Children	-Forest Restoration -Predator Control	-Rare Bird Species -Fairly Cheap -Games and Treats	-School Needed
Pukaha Mount Bruce Exclusive Behind the Scenes Tour	Help team: Find food for tuatara, feed eels, prepare kaka food. Tour in "staff only" area of kiwi house, meet semi-blind tuatara. Learn stories of birds during tour of aviaries. Watch kiwi health check or kaka banded. May plant native trees http://www.pukaha.org.nz/	All ages	-Bird Identificatio n -Forest Restoration -Predator Control	-Educational -Hands-on -Critical Thinking	-Price
Pukaha Mount Bruce One Hour Tour	Guided tour filled with stories about forest restoration and predator control efforts. Might help feed tuatara or eels, explore the place http://www.pukaha.org.nz/		-Bird Identificatio n -Forest Restoration -Predator Control	-Educational -Hands-on	-Short -Not as Hands-on
Kiwi Conservatio	There are 35 birds to learn about and identify	All ages	-Bird Identifcatio	-Lots of info	-Too many words

n Club Online Bird Education	http://www.kcc.org.nz/birds		n		
DOC Identifying New Zealand Forest Birds	Classes on the 10 most common forest birds to allow people to identify by look, behavior, and sound. http://www.doc.govt.nz/getting-involved/training-and-teaching/online-courses/bird-identification-online-course/	All ages	-Bird Identifcation	-Lots of info	-Too many words
Wellington Marine Conservation Trust Octopus Club School Programs Guided School Trips Ocean Outreach	Meets school curriculums. Activities can be tailored to suit the needs of any age group and are linked to one or more of the six science learning strands. They also come to the classrooms too http://www.octopus.org.nz/content/wellington-marine-conservation-trust	All ages	Marine	-Fits in school curriculum! -Hands-on -Wide variety of information	-Price -Website not detailed
Wellington Marine Conservation Trust Experiencing Marine Reserves	4 day program to introduce children to marine life through classroom discussions followed by snorkel training and dive experiences. Program aims to raise awareness, understanding function of reserves, differences between unprotected and protected marine areas in Wellington region. Action project at the end http://www.octopus.org.nz/content/wellington-marine-conservation-trust	All ages	Marine	-Educational -Hands-on -Long -Action Based	
Wellington	Gives increased	All ages	Marine	-Educational	

Marine Conservation Trust WhiteBait Connection	understanding of importance of freshwater environments to estuaries and harbours. Students examine health of stream and do critical thinking opportunities. Water sampling, fish and invertebrate identification, and mitigation are topics covered by trained staff during in-class sessions and field trips. http://www.octopus.org.nz/content/wellington-marine-conservation-trust			-Hands-on -Long -Action Based -Outreach	
Staglands Wildlife Reserve	Connect with nature by interacting with and feeding the wildlife http://www.staglands.co.nz/	All ages	Bird	-School programs -Hands-on -Price -A lot to do	
Kiwi Rangers	Encourages kids to get out in nature with a booklet to complete activities to earn the Kiwi Ranger Badge http://www.rimutakatrust.org.nz/	All ages	-Bird/Plant Identification and safety - outdoor health and safety	-Hands-on -Individual Work	
Water Safety New Zealand Online	Educational website to help families learn to swim, wear and use the right safety equipment, learn survival skills http://www.watersafety.org.nz/	All ages	Water Safety	-Lots of info	-Very long and wordy -Not geared for children
Rimutaka Forest Park Trust	Organization committed to protecting and restoring unique flora and fauna of the Rimutaka Forest Park. They have programs in some events where kids can earn a badge! http://www.rimutakatrust.org	All ages	-Pest Eradication -Bird/Plant Safety	-Lots to do -Kid Centered -Outdoor -Includes Families -Volunteer Opportunities	-Changes Events

	.nz/				
Whakatane Kiwi Trust Kiwi Tracker	Exclusively for teachers for educating children about conservation http://www.whakatanekiwi.org.nz/resources/all-about-learning.asp	All ages	Bird Identification	-Hands-on -School-based	-One-Time Experience
Kāpiti Explorer Guided Tours	Nature reserve/bird sanctuary, Rarest birds, see whales and dolphins. Has tours http://www.kapitimarinecharter.co.nz	All ages	Bird Identification	-Family can be involved -Rare Birds -School Tours	-Price
Wellington Zoo Bush Builders	Urban students learn about biodiversity in schools and teaches them to take action http://www.wellingtonzoo.com/content/learning/School-programmes.aspx	Older Kids	Various	-Outdoors	
Wellington Zoo Conservation Challenge	Students take action on a topic important to them -Identify a local environmental issue, design a plan of action, put the plan into action, collate and evaluate the results, present http://www.wellingtonzoo.com/content/learning/School-programmes.aspx	5 to 13	Various	-Competition style projects provide incentive	-Price
Wellington Zoo Zoo Researchers	"Zoo Researchers gives secondary school students the opportunity to carry out a practical investigation of an animal at Wellington Zoo" http://www.wellingtonzoo.com/content/learning/School-programmes.aspx	9 to 13	Bird Identification		
Seal Coast Safari	Picked up from city to see animals like Seals, Orca	All ages	Marine	-Educational -Families	-Price

Tours	Whales, Dolphins, Wild goats, Banded dotterels, and Spur-winged plovers. http://www.sealcoast.co.nz				
Greater Wellington Regional Council Battle Hill Farm Forest Park	With forest farm and wetlands this is a place for exploring and educational classes. There is also camping. Lots of walking trails. http://www.gw.govt.nz/take-your-classroom-outside/	All ages	Flora Restoration	-Educational	-Not planned
Capital City Connections	Day long, go to planetarium, gallery, museum, Capital E History on Wellington http://www.carterobservatory.org/capital-city-connections	5 to 10	Marine	-Price -Travel	-Order Age Group -Need large age group (30)
Owlcatraz Walks	A Farm that you can go visit and feed the animals that are on it. You can see pigs, ostriches, owls, deer, alpacas and many more animals as well as the wairuru caves http://www.owlcatraz.co.nz	All ages	Flora and Fauna	-Fun	-Location
New Zealand Mountain Safety Council The Outdoor Safety Code	Learn about safety codes for hiking and then design own hiking trip with parents http://www.mountainsafety.org.nz/safety-tips/	11 to 12	outdoor health and safety	-Educational	-A lot of individual work
Botanical Garden Childrens Garden	Will be a place for kids to wander and explore and learn about the different plants that are in the garden.	Kids	Plant Identification	-Price -Location	-Not Made Yet

	http://wellington.govt.nz/recreation/enjoy-the-outdoors/gardens/botanic-garden				
Botanical Garden Tours	Many tours available that cover evolution of flowers and chemistry of plants or the coexistence of different plants http://wellington.govt.nz/recreation/enjoy-the-outdoors/gardens/botanic-garden/events-calendar	All ages	Plant Identification	-Families	-Events Change
Pukaha Mount Bruce Junior Rangers	Kids go off without parents to explore national center with lunch included from 11am-3pm. They look at caring for birds and plants and insects and the eco-system. http://www.pukaha.org.nz/junior-rangers	6 to 12	Birds Plants	-Individual	-Location
Nga Manu Nature Reserve	http://www.ngamanu.co.nz/	All ages	Birds	-Hands-on -Educational -Schools	-Location?
Harbor Island Kaitiaki Board	This organization seems to a hub for getting programs/tours for Matiu Somes island. They have volunteering, Eastbourne Forest Rangers, Tree Releasing, Planting, and Karobusters.	All ages	-Planting - Restoration	-Matiu Somes -Volunteering	-Age Group? - Educational?
Island Bay Marine Education Centre Our Marine Exploration Programs Explore,	See, learn, feel animals. "All our education programmes, hands-on activities, and live displays are designed to encourage a better understanding and appreciation of Wellington's South Coast environment,	All ages	Marine	-Location -Educational	

Discover, Learn!	and to foster a sense of guardianship in visitors for all New Zealand's marine environments both outside as well as within marine reserves." http://www.pnbst.Māori.nz/what-we-do/environmental-well-being/harbour-islands-matiu-makaro-and-mokopuna/				
Island Bay Marine Education Center Guided Snorkeling Tour	Guided snorkelling tour of Taputeranga Marine Reserve for many water animals and plants can be identified http://www.octopus.org.nz/content/marine-exploration-programmes	7+	Marine	-Educational -Provides Gear	-Need 4 People -Dependent on Weather
DOC Exploring Nature with Children Booklet	Filled with ideas of activities parents can do with their children like making bird feeders, weta hotels, growing plants and many more. http://www.octopus.org.nz/content/discovery-programmes-everyone	All ages	Various		-Not a program
DOC Do the Kids' Conservation Quiz	Question about conservation that are aimed for children http://www.doc.govt.nz/getting-involved/conservation-activities/kids-quiz/	All ages	Various	-Geared for children	-Very Hard!
DOC Habitat the Game	App for children where they take care of a polar bear by earning badges from places they visit and activities they do http://www.doc.govt.nz/getting-involved/training-and-teaching/education-projects-and-programmes/habitat-the-	7 to 12	Fauna	-Mobile App	-Educational?

	game/				
DOC Create Your Own Nature Scrapbook	Creative way to appreciate nature experiences http://www.doc.govt.nz/getting-involved/training-and-teaching/education-projects-and-programmes/habitat-the-game/	All ages	Various	-Individual	
Nature Space Pest-Fest	A fair for the whole family to learn about the possums, rats and stoats that are invading the country. There are childrens crafts and demonstrations http://www.naturespace.org.nz/pest-fest-a-pest-acular-display-of-conservation-partnerships-in-action	All ages	Bird Identification	-Fun	
DOC Freshwater Board Game	This is a board game that teaches people and kids about freshwater ecosystems http://www.doc.govt.nz/getting-involved/conservation-activities/play-the-freshwater-board-game/	All ages	Marine	-Can be done anywhere	-Not Nature Based

Appendix B: List of organizations and programs

- Pukaha Mount Bruce
    - Night Adventure
    - Day Education Visit
    - School Sleepover
    - Exclusive Behinds the Scene Tours
    - One Hour Tour
    - Junior Rangers
- Kiwi Conservation Club
    - Online Bird Identification Quiz/Game
- DOC
    - Online Identifying New Zealand Birds Quiz
    - Exploring Nature with Children Booklet
    - Do the Kids' Conservation Quiz Online
    - Habitat the Game
    - Create Your Own Nature Scrapbook
    - Freshwater Board Game
- Wellington Marine Conservation Trust
    - School Programs
    - Guided School Trips
    - Ocean Outreach
    - Experiencing Marine Reserves
    - WhiteBait Connection
- Staglands Wildlife Reserve
- Kiwi Rangers
- Water Safety New Zealand
    - Online Information
- Rimutaka Forest Park Trust
- Whakatane Kiwi Trust
    - Kiwi Tracker
- Kāpiti Explorer
    - Guided Tours
- Wellington Zoo
    - Bush Builders
    - Conservation Challenge
    - Zoo Researchers
- Seal Coast Safari
- Greater Wellington Regional Council
    - Battle Hill Farm Forest Park

- Capital City Connections
- Owlcatraz
    - Farm and Nature Walks
- New Zealand Mountain Safety Council
    - The Outdoor Safety Code
- The Botanical Garden
    - Garden Tours
    - Children's Garden
- Nga Manu Nature Reserve
- Harbor Island Kaitiaki Board
- Island Bay Marine Education Center
    - Our Marine Exploration Programmes Explore, Discover, Learn!
    - Guided Snorkeling Tours
- Nature-Space
    - Pest-Fest

Appendix C: Benefactors table

Benefactors		
Wellington City Council	Pelorus Community Trust	Prime Community Trust
The Wellington Marine Conservation Trust	Wairarapa Building Society	ACC
Grant applications	Genesis Energy	Sport New Zealand
Whakatāne West Rotary	Higgins Group Ltd	Henergy Eggs
DOC	New Zealand Community Trust	
kickstarter	Tararua District Council	
individual donations; kindness of the community	Masterton District Council	
new zealand mountain safely council	Eastern & Central Community Trust	
Wellington Regional Amenities Fund	Central Energy Trust	
Greater Wellington	New Zealand Lotteries Grants Board	
Abslolutly Positivly Wellington	Masterton South Rotary	
Kapiti Coast District Council	Mount Bruce Hall Committee	
QEII National Trust	Lands Trust Masterton	
Waikato Biodiversity Forum	Tranzit Coachlines	
Horizons Regional Council	DB Breweries Ltd - Tui Brewery	
Hutt City	Pharazyn Charitable Trust	
Hawke's Bay Regional Council	Enumerate Accountants	
Bay of Plenty Regional Council	Hoffman Ford Pahiatua	
WWF	Watson & Son	
Auckland Council	Sealord	
NZ Landcare Trust	New Zealand Post	
membership subscriptions	Media Works	
fundraising: ask people at who look at the website to raise money to donate	Plunket	
Trust House Charitable Trust	Maori Television	

Appendix D: Patrons table

Patrons
Sirocco, big parrot
Tahi the one-legged kiwi
owls?
new zealand mountain safely council
Fantail bird?
Woody Weed
Rimu the Kiwi
Kiri the Kereru
Manukura, little white kiwi

Appendix E: Pest control and trapping module with programs

*Green box = selected for final recommendation

*Red box = not included for final recommendation

Pest Control and Trapping Programs				
Program Name	Zealandia Sleep Over	Day Education Visit at Pukaha Mount Bruce	School Sleep Over Visit at Pukaha Mount Bruce	One Hour Tour at Into the Wild Pukaha Mount Bruce
Hands-on and Activity Based			X	
Outdoor Activities	X	X	X	X
Critical Thinking Skills				
Deliverables Short or Long Term				
Length of Program More Than a Day	X		X	
Educational	X	X	X	X
Parents Involved				
Program?	Yes		Yes	No, Tour
School Program?			X	
Online?				
Comments				
Total	3	2	4	2

Appendix F: Bird identification module with programs

*Green box = selected for final recommendation

*Red box = not included for final recommendation

*Yellow box = programs selected as backups for the final recommendations

Bird Identification Programs								
Program Name	Night Adventure ... Into the Wild Pukaha Mount Bruce	Online Bird Education ... Kiwi Conservation Club	DOC: Identifying New Zealand Forest Birds	Kiwi Tracker	Guided Tours/Information Packets ... Kapiti Island	Nga Manu Nature Reserve	Pest-Fest	Exclusive Behind The Scenes Tour at Pukaha Mount Bruce
Hands-on and Activity Based				X		X	X	X
Outdoor Activities	X			X	X	X		X
Critical Thinking Skills		X	X	X				X
Deliverables Short or Long Term								
Length of Program More Than a Day		X	X					
Educational	X	X	X	X		X		X
Parents Involved	X				X	X	X	
Program?	yes	ya	ya	ya			no	ya
School Program?	could be	could be	could be	ya	could be	no	no	N/A
Online?	no	ya	ya	no	no	no		no
Comments	night tour	more interesting for kids then DOC	10 most common forest bird	for schools only	tour of an island	bird feed-out tour 11am	fair	hear stories of all the birds
Total	3	3	3	4	2	4	2	4

Appendix G: Plant identification module with programs

*Green box = selected for final recommendation

*Red box = not included for final recommendation

*Yellow box = programs selected as backups for the final recommendations

Plant Identification Programs		
Program Name	Childrens Garden	Botanical Garden Tours
Hands-on and Activity Based		
Outdoor Activities	X	X
Critical Thinking Skills		
Deliverables Short or Long Term		
Length of Program More Than a Day		
Educational	X	X
Parents Involved		Maybe
Program?		
School Program?		
Online?		
Comments	Not Made Yet	
Total	2	2

Appendix H: Plant identification module with program

*Green box = selected for final recommendation

*Red box = not included for final recommendation

*Orange box = school program recommendation if schools are involved

Marine Wildlife Protection and Water Safety Programs										
Program Name	Wellington Marine Conservation Trust Octopus Club School Programs	Wellington Marine Conservation Trust Octopus Club Guided School Trips	Wellington Marine Conservation Trust Octopus Club Ocean Outreach	Wellington Marine Conservation Trust Octopus Club Experiencing Marine Reserves	Wellington Marine Conservation Trust Octopus Club WhiteBait Connection	Water Safety New Zealand	Seal Coast Safari	Octopus club: Our Marine Exploration Programmes Explore, Discover, Learn!	Wellington Marine Conservation Trust Octopus Club WhiteBait Connection Guided Snorkling Tour	Freshwater Board Game
Hands-on and Activity Based	X		X	X	X			X	X	X
Outdoor Activities	X	X		X	X		X		X	
Critical Thinking Skills	X		X	X	X					
Deliverables Short or Long Term						X				
Length of Program More Than a Day			X	X						
Educational	X	X	X	X	X		X	X		X
Parents Involved						X	X		X	X
Program?	X	X	X	X	X		X	X	X	
School Program?	X	X	X	X	X			X		
Online?						X				
Comments			a school program. day one is in the classroom, then they go on a field trip to an aquarium or some marine location	classroom discussion and then going out and snorkling	classroom to oursdoors	mostly for parents. no real activity	car ride to see seals	1 to 2 hour program indoors	groups of 4 or more snorkling with an instructor	board game that you print out
Total	4	2	4	5	4	2	2	2	2	2

Appendix I: Outdoor health and safety module with programs

*Green box = selected for final recommendation

*Red box = not included for final recommendation

Outdoor Health and Safety Programs	
Program Name	The Outdoor Safety Code
Hands-on and Activity Based	X
Outdoor Activities	X
Critical Thinking Skills	X
Deliverables Short or Long Term	
Length of Program More Than a Day	X
Educational	X
Parents Involved	X
Program?	
School Program?	
Online?	Partly
Comments	
Total	6

Appendix J: Plant and wildlife protection and restoration module with programs

*Green box = selected for final recommendation

*Red box = not included for final recommendation

*Yellow box = programs selected as backups for the final recommendations

Plant and Wildlife Protection and Restoration Programs															
Program Name	Rimutaka Forest Park Trust	Battle Hill Farm Forest Park	Farm Walk and Many Other Nature Walks	Junior Rangers at Pukaha Mount Bruce National Wildlife Centre	Harbor Island Kaitiaki Board	Exploring Nature With Children Booklet	Do the Kids' Conservation Quiz	Habitat the Game	Create Your Own Nature Scrapbook	Staglands Wildlife Reserve	Kiwi Rangers, Wellington Area	Conservation Challenge at the Wellington Zoo	Capital City Connections	Bush Builders	Matiu Somes Island
Hands-on and Activity Based	X	X		X	X	X			X	X	X	X	X	X	X
Outdoor Activities	X	X	X	X	X	X		X		X	X	X		X	X
Critical Thinking Skills	N/A			X	X	X	X				X	X		X	
Deliverables Short or Long Term				N/A	N/A, but I want to say yes	X			X			X	X	X	
Length of Program More Than a Day	X			X	X If you do the rangers			X			X	N/A			Could Be
Educational	X	X		X	X	X	X			X	X	X	X	X	X
Parents Involved	X	X	X			X			Maybe			Maybe			
Program?	No Ongoing Events	No Plan on your own	No Play on farm	Rangers Program	No Volunteering and other events	No Booklet downloaded from online	No Online Quiz	No Phone game	No Making scrapbook	No	Yes	Yes	No Day Tour	Yes	No
School Program?										Could Be		N/A		X	Could Be
Online?						X	X	X							
Comments	olunteerin			This is made for 7-12 year olds	Works with Matiu Somes and includes Ranger opportunities		Really difficult			Good for interacting with animals and nature		This is great for critical thinking skills and having them produce their own work	Not focused on conservation		
Total	5	4	2	5	5	6	2	2	2	3	5	5	3	5	3

Appendix K: Interview questions set 1

The set of interview questions below were asked in the interviews with:

- Becky Wilson
- Darren van Hoof
- Lynn Allan
- Terese McLeod

The set of questions are:

1. How did you become involved with conservation and/or educating children? What was your inspiration?
2. Have you been involved with a children's conservation program that you thought would be successful and generate a lot of interest, but ended up not being as strong as you anticipated? What sorts of things led to that outcome?
3. What do you think are the most important topics about conservation that kids should be educated about today?
4. What are the most exciting trends in children's conservation education in your view?
5. How has your organization come up with conservation programs?
6. How do you try to gain and maintain children's interest within your programs? What do you think constitutes a successful program?
7. What do you think children are most and least interested in regarding conservation? What topics are they excited to learn about and which do they seem bored by? What activities seem to engage them well?
8. In your experience, what needs to be put in place to make a good program for children's conservation education? Can you describe examples from your organization?
9. What do you think is lacking in conservation efforts for kids today?
10. What kinds of programs would you like to implement if you had unlimited resources?
11. What resources would you need to do the things you really wish you could do?

Appendix L: Interview questions set 2

The set of interview questions below were asked in the interviews with:

- Emma Dunning
- Aristya Marzuki
- Jo Greenman
- Daryl Stephens

The set of questions are:

1. How did you become involved with conservation and/or educating children? What was your inspiration?
2. What do you think are the most important topics about conservation that kids should be educated about today?
3. What are the most exciting trends in children's conservation education in your view?
4. How has your organization come up with conservation programs?
5. How do you try to gain and maintain children's interest within your events that you know of? What do you think constitutes a successful program?
6. What do you think children are most and least interested in regarding conservation? What topics are they excited to learn about and which do they seem bored by? What activities seem to engage them well?
7. In your experience, what needs to be put in place to make a good program for children's conservation education?
8. Have you been involved with a children's conservation program that you thought would be successful and generate a lot of interest, but ended up not being as strong as you anticipated? What sorts of things led to that outcome?
9. What do you think is lacking in conservation efforts for kids today?
10. What kinds of programs would you like to implement if you had unlimited resources?
11. What resources would you need to do the things you really wish you could do?

Appendix M: Interview questions set 3

The set of interview questions below were asked in the interviews with:

- Sarah Rusholme

The set of questions are:

1. How did you become involved with conservation and/or what was your inspiration?
   What was the motivation for creating Nature Connection?
2. What do you think are the most important topics about conservation education in your view?
3. What do you think is beneficial about having conservation organizations work together?
4. If you were around when Nature Connections started, how did you gain interest and support from it?
5. Was there any oppositions to the program and how did you get around that?
   Was there any opposition from organizations you reached out to?
6. What do you think is lacking in childrens conservation education?
7. Do you think it would be beneficial to teach children about climate change?
8. Do you think it would be beneficial to teach children about water pollution?
9. If you were to start up a children's conservation program what would be the topic?

Appendix N: Interview questions set 4

The set of interview questions below were asked in the interviews with:

- Anita Anderson
- Angeline Barns

The set of questions are:

1. How did you become involved with conservation and what was your inspiration?
2. What do you think are the most important topics about conservation that children should be taught about today?
3. What are the most exciting trends in conservation education in your view?
4. How do you think programs should be structured to gain and maintain children's interest?
5. What do you think children are most and least interested about regarding conservation?
6. What do you think are the best methods of incorporating conservation into school curriculums?
7. Do you think after-school programs are beneficial and effective?
8. What are the toughest obstacles faced when trying to incorporate conservation into schools?
9. Between conservation in or after school and standalone programs, which do you think are more beneficial and effective for children's education?
10. What do you think are the best ways or methods that children learn?
11. Is there anything you would like to see differently regarding teaching in conservation programs for children?
12. How do you think a program about climate change or water pollution would need to be structured in order to be beneficial for children?
13. What kinds of programs would you like to implement if you had unlimited resources?