

The role of hope and conservation  
attitudes in current conservation action  
and future conservation intention:  
Implications for community-led  
conservation in Aotearoa New Zealand

Helen Ruth Ough Dealy

A thesis submitted to Auckland University of Technology in fulfilment of the requirements for  
the degree of Doctor of Philosophy (PhD)

2023

Department of Environmental Science

School of Science

Faculty of Health and Environmental Sciences

*World in the Present-day*



*Note.* By AUT003, 2019, collage, mixed media.

*World in the Future*



*Note.* By AUT003, 2019, collage, mixed media.

## Abstract

Introduced mammalian predators threaten Aotearoa New Zealand's endemic species with extinction. Current Aotearoa New Zealand voluntary community-led conservation (CLC) actions (e.g., planting, weeding, predator control) support present and future biodiversity restoration. CLC predator control efforts, in particular, may contribute to a predator-free nation by 2050. However, while present-day conservation volunteer efforts are measurable, future CLC activity is uncertain. Aotearoa New Zealand national open-source demographic data and national and regional conservation attitude and action data projections suggest an ageing, more diverse population with changing urban/rural population ratios. Increased financial debt extending to later ages implies an extended time in employment and work insecurity for some. These factors may reduce future active regular conservation volunteering, thus limiting CLC group sustainability and Aotearoa New Zealand's current predator control achievements and future predator-free aspirations. Therefore, understanding factors that positively influence CLC volunteers to undertake conservation action now and in the future may support conservation volunteer retention, recruitment, and thus biodiversity restoration. CLC efforts rely on individual willpower and problem-solving to achieve future-oriented goals. Snyder's Theory of Hope incorporates agency and pathways thinking, thus supporting current conservation action and future conservation intention. Likewise, understanding conservation attitudes may support voluntary CLC engagement. In this thesis, I adopt a mixed-method approach that identifies and addresses a gap in CLC recruitment and retention, the potential relationships between hope, conservation attitudes, current conservation action, and future conservation intention. First, I develop and administer collage-elicited interviews, an innovative visual arts-based means of better understanding people's feelings about and place in their present and future worlds. I then conduct a reflexive thematic analysis of these interviews resulting in six common themes, commitment to the natural world, connectivity to the environment and other people, group action, learning cycle, practical solutions, and unconditional belief. Second, I survey 243 Aotearoa New Zealand adults' hope, conservation attitudes (derived from the six collage-elicited themes), current conservation actions, and future conservation intentions. Survey results indicated a complex relationship between conservation attitudes, hope, current conservation action, and future conservation intention in the adult Aotearoa New Zealand context. Understanding Aotearoa New Zealand adult conservation attitudes may help increase conservation efforts and support sustainable CLC project designs, delivering positive outcomes for biodiversity in the long term. Furthermore, my research addresses the conservation attitude and hope knowledge-action gap by proposing practical approaches to current conservation volunteer retention and future intention to act for conservation. These

include developing an Accessing and Applying Conservation Attitudes kit enabling CLC groups, conservation-related government departments and NGOs to support current CLC biodiversity restoration actions and future intentions.

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## Attestation of Authorship

I hereby declare that this submission is my work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements) nor material which, to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

Helen Ough Dealy

Date: 31/03/2023

## Co-authored Works

Chapters 3, 4, and 5 of this thesis are three separate papers that have been submitted for publication to international and national peer-reviewed journals. Two papers have been published, and the third is currently under review. All co-authors approved the inclusion of these co-authored works in this doctoral thesis.

### Chapter 3

Using open-source aggregated data to understand future community-led conservation volunteering (Ough Dealy et al., 2022).

Author	Section	Contribution	Signature
Helen Ough Dealy	Concept, data collection, analyses, structure, and writing	80%	
Rebecca Jarvis	Supervising, reviewing, editing and feedback	10%	
Michael Petterson	Supervising, reviewing, editing and feedback	10%	

### Chapter 4

Innovative ways of illustrating the present, imagining the future and analysing themes: A collage-elicited interview study (Ough Dealy et al., 2021).

Author	Section	Contribution	Signature
Helen Ough Dealy	Concept, data collection, analyses, structure, and writing	80%	
Rebecca Jarvis	Supervising, reviewing, editing and feedback	10%	
Michael Petterson	Supervising, reviewing, editing and feedback	10%	

## Chapter 5

The role of hope and attitudes in current conservation actions and future conservation intentions (Ough Dealy et al., Under review).

Author	Section	Contribution	Signature
Helen Ough Dealy	Concept, data collection, analyses, structure, and writing	70%	
Rebecca Jarvis	Supervising, reviewing, editing and feedback	10%	
Tim Young	Data analyses, reviewing and feedback	10%	
Kushaal Maharaj	Data collection	5%	
Michael Petterson	Supervising, reviewing, editing and feedback	5%	

## Associated Research Outputs

### Peer-reviewed Journal Publications

1. Ough Dealy, H. R., Jarvis, R. M., & Petterson, M. (2022). Who will be New Zealand's community conservationists by 2050? Using open-source aggregated data to understand future community-led conservation volunteering. *New Zealand Population Review*, 48, 78–119. [https://population.org.nz/wp-content/uploads/2022/12/Dealy\\_formatted.pdf](https://population.org.nz/wp-content/uploads/2022/12/Dealy_formatted.pdf)
2. Ough Dealy, H.R., Jarvis, R.J. & Petterson, M. (2021) Innovative ways of illustrating the present, imagining the future, and analysing themes: A collage-elicited interview study. *Methodological Innovations*. 14(3). <https://doi.org/10.1177/205979912111051452>

## Manuscript Under Review

Ough Dealy, H.R., Jarvis, R.J., Young, T., Maharaj, K. & Petterson, M. (under review) The role of hope and attitudes in current conservation actions and future conservation intentions. *Discover Sustainability*.

## Conferences, Symposia, and Workshops

1. Ough Dealy, H.R., Jarvis, R., & Petterson, M. (2022, August). *Planning your future using Op Shop treasures*. Soapbox talk at Sanctuaries of New Zealand Workshop, Nelson, New Zealand.
2. Ough Dealy, H.R., Jarvis, R., & Petterson, M. (2022, August). *Understanding the roles of hope and conservation attitudes in retaining and attracting community conservationists*. Presentation at Sanctuaries of New Zealand Workshop, Nelson, New Zealand.
3. Ough Dealy, H.R., Jarvis, R., & Petterson, M. (2021, June-July). *The role of hope and attitudes in current and intended conservation actions*. E-poster presentation at the International Positive Psychology Association Conference. Online.
4. Ough Dealy, H.R., Petterson, M. & Jarvis, R. J. (2020). *Bridging the gap: Current and future community-led conservation*. Presentation at the School of Science Auckland University of Technology Workshop, Auckland, New Zealand.
5. Ough Dealy, H.R., Jarvis, R. & Petterson, M. (2018, November). *What's hope got to do with it? The role of learned hopefulness in community conservation sustainability*. Presentation at the New Zealand Ecological Society Conference, Wellington, New Zealand.
6. Ough Dealy, H.R., Petterson, M. & McDonald, E. (2018, April). *Youth demographics: Opportunities for future-proofing community-led conservation?* Presentation at the New Zealand Association of Environmental Educators 8th Biennial Conference: An Ecosystem for Environmental Education, Wellington, New Zealand.

7. Ough Dealy, H.R., Petterson, M., Towns, D.R., McDonald, E., & Jarvis, R. (2018). *Who will be the Conservation Champions?* Presentation at the Auckland University of Technology Research Showcase Symposium, Auckland, New Zealand.
8. Ough Dealy, H.R., Petterson, M., Towns, D.R., McDonald, E., & Jarvis, R. (2018). *First steps in understanding who will be New Zealand's Conservation Champions.* Poster presentation at the Auckland University of Technology Research Showcase Symposium, Auckland, New Zealand.

## Other Outputs

1. Ough Dealy, H.R. (2021 October-November). Various topics include *Attitudes and community conservation volunteering*, *Collage-elicited interview techniques*, and *Harnessing hope in community conservation volunteering*. Online upskilling presentations/workshops for Community team members, Northern North Island Region, Department of Conservation, Kerikeri, New Zealand.
2. Ough Dealy, H.R., Jarvis, R.J. & Petterson, M. (2021, June). *What does hope have to do with community-led conservation?* Presentation at the National Office, Forest & Bird, Wellington, New Zealand.
3. Ough Dealy, H.R., Jarvis, R.J. & Petterson, M. (2021, June). *What does hope have to do with community-led conservation?* Presentation at the National Office, Department of Conservation, Wellington, New Zealand.
4. Ough Dealy, H.R., Jarvis, R.J. & Petterson, M. *What does hope have to do with community-led conservation?* (2021, March). Presentation at the Russell Museum *Exploring Hopefulness* exhibition closing, Russell/Kororāreka, New Zealand.
5. Ough Dealy, H.R., Jarvis, R.J. & Petterson, M. (2020, December). *Hope for a predator-free New Zealand: Current New Zealand conservation attitudes and anticipated future conservation actions.* Presentation at the Russell Museum *Exploring Hopefulness* exhibition opening, Russell/Kororāreka, New Zealand.

# Acknowledgements

*Ehara taku toa i te toa takitahi, engari kē he toa takitini*

My success is not due to me alone, but the success of a collective.

It is said that it takes a village to raise a child; in my case, it took an extended whānau to create this PhD. There are many individuals, groups, and organisations that I need to acknowledge. If I have missed naming anyone in person, my apologies; please accept my gratitude.

Thank you to the Auckland University of Technology (AUT) and Department of Conservation (DOC) supervisors and technical specialists who guided, cajoled and encouraged me through various stages of the PhD. Initially, Edy Macdonald (DOC) and Dave Towns (AUT) supported my studies, then latterly Mike Petterson (AUT), Becs Jarvis (AUT), and Hannah Buckley (AUT).

Thank you, in particular, to Mike and Becs, who have been there for the long haul. I could not have asked for better or more patient supervision. I also thank Tim Young for his statistical knowledge, support, and patience with a 'statsphobe.' Thanks also to Kushaal Maharaj (AUT summer intern) for collecting the survey data over a very long hot summer.

I am very grateful to DOC. Without the department's financial and study leave support, I would not have been able to start, let alone complete, this research. I am also thankful to my DOC Pēwhairangi/Bay of Islands Office colleagues, Fleur Corbett and the community team. They picked up the slack when I transitioned to part-time work, full-time study, and back. I thank Rolien Eliot, Brony Bauer-Hunt, and Sue Reed-Thomas for supporting my study applications; Helene Thygessen for statistical confidence-building; Jo Aley for her social science research knowledge and support; Barbara Bercic for Predator Free 2050 terminology assistance, and Bruce Norris for helpful feedback on using list apps., within a government context.

To my AUT PhD buddy group, Annalise Roache, Coralie Bridle, and Emily Griffin. Thank you for sharing your support and aroha. We started as strangers, but walking similar paths, we have become friends.

I am grateful to those from across New Zealand who created collages and shared their thoughts about their place in the world today and in their future world. You made working with the themes on which the survey was based possible.

Raji Unka provided expert transcription services, while Sue Knox's expertise in thesis formatting was invaluable.

I am also grateful to Michelle Kitney (Volunteering NZ) and Sarah Satterthwaite (Forest & Bird) for encouraging their members to participate in my research.

Moreover, thanks to the anonymous reviewers who helped clarify the text that formed thesis chapters 3, 4, and 5.

My appreciation in the Bay of Islands goes to Dalia Jones, Ria Bright, Karen Field, Terri Cottier, and Vicky Froude. You have challenged my ideas with wit and determination. Thanks also to William Fuller for his thoughts regarding the educational environment, Kipa Munro, who advised me on research aspects associated with Te Ao Māori, and Eing and Logan for helping me play with data.

I also acknowledge Russell Museum *Te Whare Taonga o Kororāreka* and its Board of Trustees for hosting an exhibition of collages and mini-lecture series based on my research results. Furthermore, I thank Russell Primary School pupils who demonstrated the attitude elicitation potential of collages among younger people.

However, most of all, thank you to my family – my parents, Minnie and Martin Ough Dealy, and my sister Jane Ough who believed I could do it, even though unsure what it was I was doing. Furthermore, thanks to my cousins, Alice and Sue, for providing homes away from home. My special thanks go to Lindsay, my husband, and Alex, our daughter, who have walked with me every step with patience, love, and support. This thesis is for you all.

## Ethical Approval

Approval for the research carried out in this thesis was given by the AUT University Ethics Committee (AUTEC 18/406) on 29 January 2019.

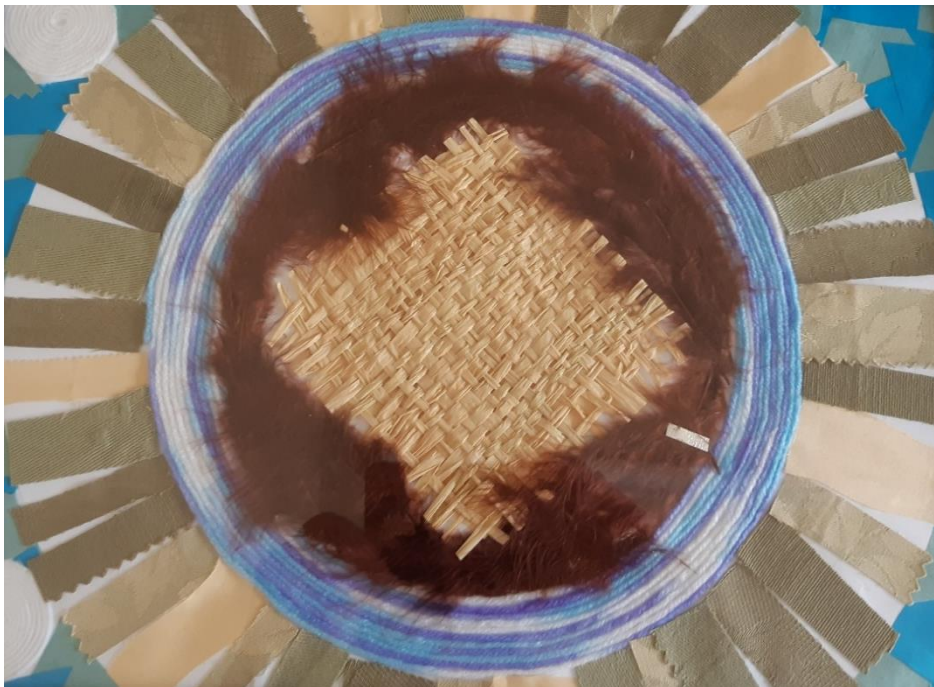
# Chapter 1 Introduction

*World in the Present-day*



*Note.* By AUT002, 2019, collage, mixed media.

*World in the Future*



*Note.* By AUT002, 2019, collage, mixed media.

## 1.1 Background

Global biodiversity change is one of our most pressing environmental issues (Department of Economic and Social Affairs, n.d.; United Nations Environment Programme, 2021). One ecosystem restoration approach, and thus species survival, is conservation. Conservation acts protect and maintain the natural environment's biodiversity. Conservation may also include deliberate restoration activities (e.g., endemic species planting, removal of invasive plant and mammalian species through weeding and predator control). Such actions are intended to accelerate the recovery of damaged or degraded ecosystems (Reid et al., 2011). The United Nations Decade on Ecosystem Restoration 2021–2030 (United Nations General Assembly, 2019) recognises the key roles that community engagement in conservation plays at global, national, and local scales (Predator Free New Zealand Trust, n.d.). At a national scale, community-led conservation (CLC) is central to a Predator-Free 2050 (PF2050) Aotearoa New Zealand, a predator-free nation by 2050 (Department of Conservation, 2020f). At a local scale, community conservation activities may vary, including community group planting and weeding sessions and landowner-initiated backyard predator control (Marascio, 2020; Peters et al., 2015). Community-led conservation is a dynamic process. CLC outcomes rely on continuing action, for example, establishing, maintaining, and extending predator-controlled areas. Sustaining ongoing CLC efforts is therefore vital to future biodiversity restoration success.

Conservation in Aotearoa New Zealand is achieved through various national or regional mechanisms, including government agency-led projects, local council statutory land development requirements, and non-governmental organisation (NGO) advocacy (Ministry for the Environment, 2021; Quarente, 2012; Towns et al., 2019). Individuals contribute to practical conservation on their properties or through local CLC groups on publicly-managed conservation land (QE II National Trust, 2019; Russell Kiwi Protection, 2019).

Current Aotearoa New Zealand CLC biodiversity restoration and protection actions, whether national or local, are wide-ranging and varied, including riparian plantings protecting freshwater bodies, plant species conservation, controlling invasive alien species (IAS) (e.g., rodent, wilding pine), and reintroducing endemic species (Febria et al., 2020; Peters et al., 2015; Project Island Song, n.d.-b; Woolley et al., 2021). Specifically, CLC volunteers control introduced mammalian predators including rodents (*Rattus norvegicus* and *R. rattus*), mustelids (*Mustela erminea*, *M. furo*, and *M. nivalis*), and the Australian brushtail possum (*Trichosurus vulpecula*). These species are targeted as they are detrimental to Aotearoa New Zealand's endemic bird species survival (Fea et al., 2021; Parliamentary Commissioner for the Environment, 2017).

### 1.1.1 Community-led Conservation

In 2018, Aotearoa New Zealanders contributed 159 million hours valued at \$4 billion, 2.8% of the national GDP, to various volunteer activities, including CLC (Stats NZ, 2018b; Volunteering New Zealand, 2020). However, between 2013 and 2018, while volunteer hours remained stable, Aotearoa New Zealand volunteer numbers declined from 1,229,054 to 1,008,000 (Stats NZ, 2018b). Thus, fewer individuals carried out more voluntary efforts. CLC contributions (time and financial) can be significant.

Between 2009 and 2015, CLC group number estimates appeared to increase from over 600 to more than 4000 (Ross, 2009; Russell et al., 2015). However, such data accuracy is uncertain given the likely underreporting of CLC group number and volunteer contribution (e.g., time and effort) (Brown, 2018; Shanahan et al., 2021; Stats NZ, 2018b). Irrespective of possible group number increases, future volunteering security concerns are rising within the conservation and broader volunteer sectors (Heimann, 2019; Peters et al., 2015; Russell et al., 2015; Volunteering New Zealand, 2020). These concerns are rooted in factors negatively impacting an individual's volunteering capacity; for example, current conservation volunteers are generally 50 years old and over (Peters et al., 2015). Increasing age will likely adversely impact future environmental restoration volunteering efforts, including 'hands-on' predator control, planting, and weeding. However, age is not the sole concerning factor; income precarity, accommodation uncertainty, and volunteering costs (e.g., travel to restoration sites, specialist equipment and training) may also negatively impact volunteers accessing and undertaking CLC opportunities.

A potential mismatch is thus foreshadowed between government agencies and NGO expectations of and reliance on current and possible conservation volunteer commitment, time, effort, and capacity (Department of Conservation, 2020f; Peters et al., 2015; QE II National Trust, 2019).

### 1.1.2 Attitudes, Hope, Current Conservation Action, and Future Conservation Intention

Understanding ways to improve long-term CLC sustainability and increase CLC efforts are vital in stemming worldwide biodiversity decline (Johnson et al., 2017). Consequently, it is essential to understand what motivates CLC volunteers to undertake conservation action now and what might motivate them to act in the future. According to Ajzen (1991), attitudes influence behaviour. International research suggests conservation-linked attitudes influence conservation behaviours (Ganzevoort & Van Den Born, 2020). While exploratory Aotearoa New Zealand research indicates that conservation actor attitudes may motivate voluntary

conservation behaviour (Heimann & Medvecky, 2022). Hope, too, has been defined as a cognitive trait that impacts goal achievement behaviour (Snyder, Harris, et al., 1991). CLC efforts rely on an individual's willpower to achieve future-oriented outcomes. Restoration planting, for example, entails an action sequence including preparing the planting site, sourcing and sowing seed, and then growing on and planting the seedlings, supported by ongoing weed and plant-eating predator control.

Various hope-associated relationships have been explored including depression and meaning in life, commitment to physical exercise, life satisfaction, climate change actions, and pro-environmental behaviours (Anderson & Feldman, 2020; Bailey et al., 2007; Bury et al., 2020; DiGasbarro et al., 2020; Geiger et al., 2019; Kerret et al., 2020; Maryam Hedayati & Mahmoud Khazaei, 2014; van Zomeren et al., 2019). However, the relationship between hope, conservation attitudes, current conservation action, and future conservation intention has yet to be explicitly tested (Chadwick, 2015; Ogden, 2016).

Snyder's Adult State Hope Scale (ASHS) (Snyder et al., 1996) has been internationally validated among adults from various cultures (Abdullah et al., 2018; DiGasbarro et al., 2020; Hejazi et al., 2020; Slezackova, 2017). However, ASHS has been under-utilised in New Zealand (Birdsall, 2020; Fang et al., 2020).

## 1.2 Thesis Aim, Research Question and Objectives

In this thesis, I consider potential demographic barriers to future CLC engagement. I also investigate whether motivational factors, e.g., conservation attitudes and hope, support Aotearoa New Zealand adult volunteer current conservation action and future conservation intention.

This thesis aims to develop recruitment and retention applications for national conservation agencies, NGOs, and local CLC groups that support current voluntary conservation action and future conservation intention. I achieve this aim through my research question, "In the Aotearoa New Zealand context, do hope and conservation attitudes relate to current conservation action and future conservation intention?". I have three research objectives.

Objective 1: *Understanding and mitigating barriers to current and future Aotearoa New Zealand community-led conservation volunteering*

Objective 2: *Identifying Aotearoa New Zealand adult conservation attitudes towards current conservation action and future conservation intention*

Objective 3: *Exploring relationships between Aotearoa New Zealand adult hope, conservation attitudes, current conservation action, and future conservation intention*

I will achieve each of these three objectives in Chapters 3 to 5.

In **Chapter 3**, I will describe projected barriers to Aotearoa New Zealand conservation volunteering (*Objective 1*). These barriers will provide the context that effort is needed to support volunteers with future conservation intentions.

In **Chapter 4**, I will investigate Aotearoa New Zealand conservation attitudes. This investigation will consist of two key stages, 1. creating collages to elicit comments about current conservation action and future conservation intention, and 2. thematically analysing these comments for underlying conservation attitudes (*Objective 2*).

In **Chapter 5**, I will investigate whether Aotearoa New Zealand conservation attitudes (elicited through collage-elicited interviews) and hope (tested with Snyder's ASHS measurement tool) are related to current conservation action and future conservation intention (*Objective 3*).

Finally, in **Chapter 6**, the Discussion, I will describe how national conservation agencies, NGOs, and CLC groups might utilise conservation attitudes and hope to develop practical applications. Such approaches may support biodiversity restoration through conservation volunteer retention and recruitment.

### 1.3 Originality of Thesis

This thesis explores two critical issues facing Aotearoa New Zealand CLC, 1. volunteer retention and 2. volunteer recruitment. These two issues negatively impact current and future conservation practices. I address these issues in **Chapters 3, 4, 5, and 6** by investigating relationships between conservation attitudes, hope, current conservation action, and future conservation intention. I investigate these relationships by developing novel approaches, tools, and methods.

In **Chapter 3**, I utilise open-source national Aotearoa New Zealand demographic and attitudinal data to identify barriers to CLC current and future volunteering. Such barriers have practical implications for CLC group sustainability. Subsequently, I propose practical strategies for overcoming these barriers to individual volunteer action in the short-term and longer-term group viability.

In **Chapter 4**, I adopt two novel approaches to eliciting, then analysing, individuals' conservation-related attitudes. The first utilises collage-elicited interviewing to explore future intentions to act positively for the environment. The second relates to collage-elicited interview transcript analysis. I applied Trello, a list *app.*, to determine concepts and themes based on individual responses to the future-focused conservation action and the intention question, "How do you move from the world of today to that of the future?".

**Chapter 5** explores, through a social survey, the first known investigation of the full Adult State Hope Scale within the Aotearoa New Zealand context. This survey also investigates the previously under-researched relationship between hope, conservation attitudes, current conservation action, and future conservation intention.

**Chapter 6** outlines innovative practices supportive of CLC volunteer efforts. I more fully develop one practical application – the Analysing and Applying Conservation Attitudes (AACCA) kit.

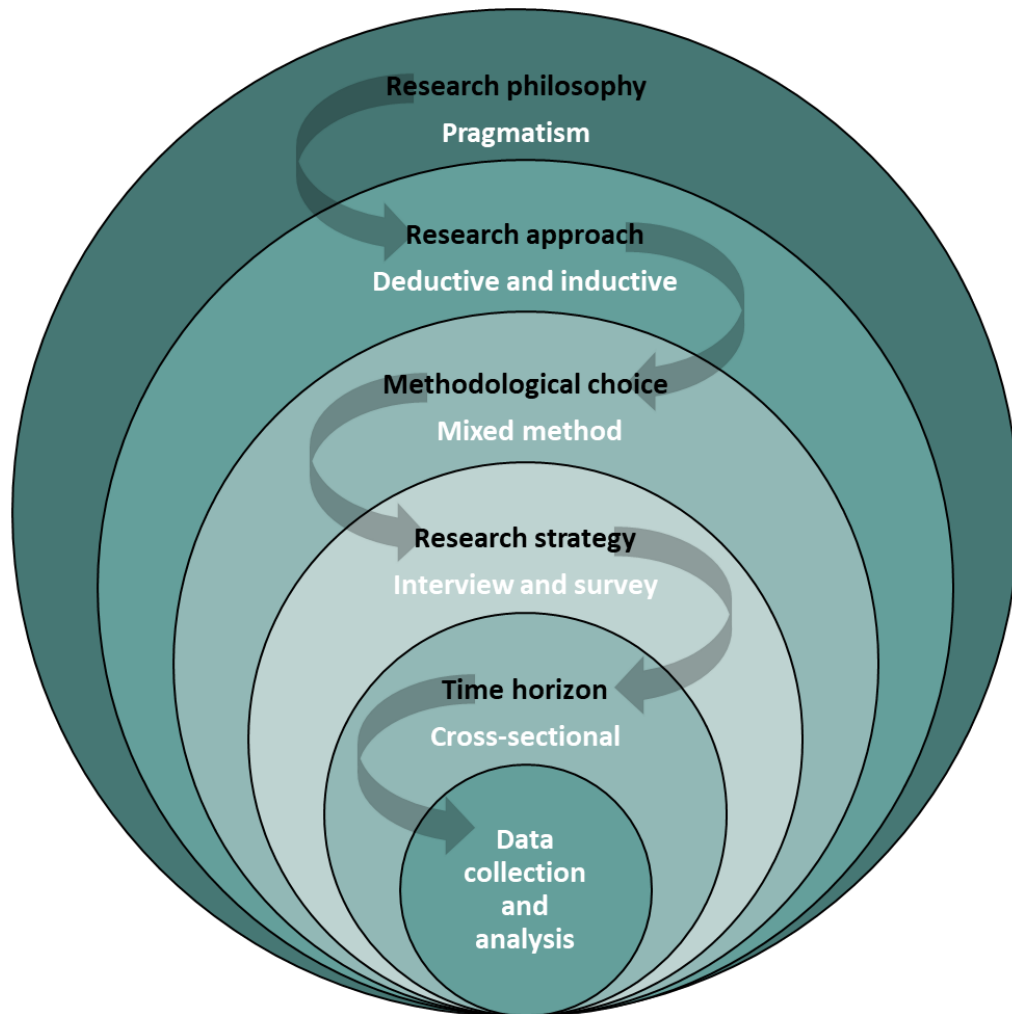
Conservation psychology has investigated conservation attitudes, current conservation action, and future intention to act for conservation. However, this is the only known research project considering the relationships between these three conservation-related aspects and hope. By testing the associations of psychological constructs with current action and future intention, my research indicates ways to operationalise an individual's cognitive traits to support biodiversity restoration.

## 1.4 Methodological Approach

CLC comprises individuals acting alone as well as individuals working together in groups. Active involvement, whether current or intended, group or individual, is shaped by an individual's attitudes. Therefore, it is necessary that my research approach is situated within, and worked from, the individual participant's context, where "different meanings (Fire and Emergency NZ) for different people in different situations" (Coghlan & Brydon-Miller, 2014). Consequently, I have adopted the research paradigm, Pragmatism, to uncover contextualised knowledge and its expression through 'real world' problem-solving (Coventry University, n.d.; Cresswell & Cresswell, 2018; Onwuegbuzie et al., 2009). I have adapted the Research Onion Framework (Saunders et al., 2019) to illustrate my research approach (Figure 1).

**Figure 1**

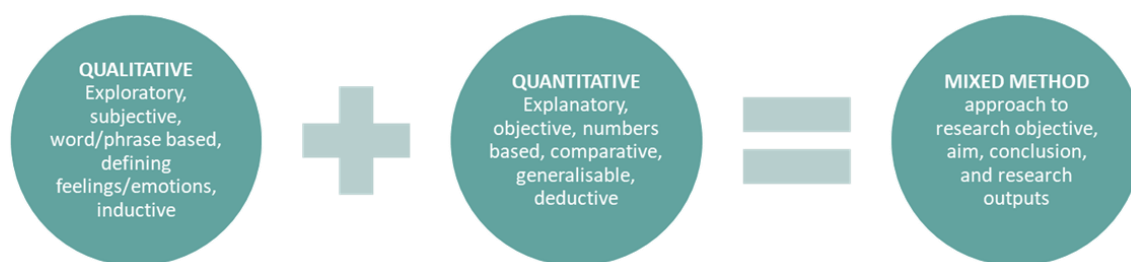
*The Research Onion Framework Applied to the Current Research. Adapted from Saunders et al. (2019).*



My research methodological approach is both inductive and deductive. The inductive ‘bottom-up’ qualitative approach progresses from gathering individual participant perspectives to developing broad themes based on that data. The deductive or ‘top-down’ quantitative approach uses specific hypotheses to test existing theories (Cresswell & Cresswell, 2018). My study’s mixed method approach also assumes that gathering data from various perspectives will provide a more complete response to the research question (Cresswell & Cresswell, 2018) (Figure 2, Table 1).

Figure 2

*A Mixed Method Approach. Adapted from Cresswell and Cresswell (2018)*



The qualitative research phase adopts a researcher-led position, exploring and interpreting individual perspectives expressed in words and phrases, thus externalising latent participant cognitions such as conservation attitudes.

My study utilises the mixed method approach; a qualitative phase followed by a quantitative methodology research phase. I chose this approach as neither the quantitative nor qualitative-based methodologies on its own can help me achieve two of my research objectives, 1. identifying Aotearoa New Zealand adult conservation attitudes towards current conservation action and future conservation intention, and 2. exploring relationships between Aotearoa New Zealand adult hope, conservation attitudes, current conservation action, and future conservation intention.

I chose the qualitative approach as it is situated in the real world, and can produce a rich variety of data from individual participants (Davies & Hughes, 2014; O'Leary, 2017). The qualitative phase enables one-on-one interviews eliciting themes which can be reframed as conservation attitude items.

In my exploratory sequential research design, qualitative data collection and analysis precedes quantitative data collection and analysis (George, 2022). The quantitative research phase thus enables me to test causal relationships with a wider population facilitating generalisability of results (Bhandari, 2022; Cresswell & Cresswell, 2018). Thus hope, conservation attitudes elicited in the qualitative research phase, current conservation action, and future conservation intention can be tested with a convenience sample of Aotearoa New Zealand adults. My research is affected by temporal, financial and resource-related constraints. These constraints necessitated utilising a convenience sample to test my hypothesis and get a 'sense' of whether further research into hope, conservation attitudes, conservation actions and intentions might be helpful (Qualtrics, 2023).

Thus this mixed method approach enables subjective experiences, sense-making, and action-taking related to perceptions of current and future worlds to be more widely tested (Braun & Clarke, 2013, 2021a; Cresswell & Cresswell, 2018). Adopting a mixed-method approach that includes deductive and inductive reasoning ((Creswell, 2014)Table 1) can overcome the shortcomings and biases of each approach.

**Table 1**

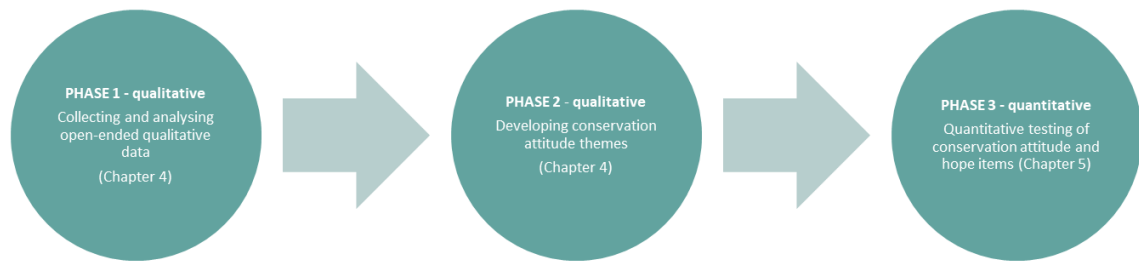
*Strengths and Limitations of Qualitative and Quantitative Research Approaches. Adapted from Cresswell and Cresswell (2018); Davies and Hughes (2014); O'Leary (2017); Ross (2012)*

Qualitative			Quantitative		
Feature	Strength	Limitation	Feature	Strength	Limitation
Exploratory	Real-world situated	Participant-specific	Explanatory	Theory-situated	Less nuanced
Interpretive	Rich variety of data	Potential researcher bias	Predictive	Hypothesis creation	Biases in surveys may affect survey validity
Word/phrase-based data collection and thematic analysis	Externalises latent cognitions e.g., attitudes	Potential researcher bias	Number-based data collection and statistical analysis	Generalisability	Less nuanced
Subjective	Rich variety of data	Potential researcher bias	Objective	Moderates researcher bias	Less nuanced
Individual/small group	Rich variety of data	Lacks generalisability	Population	Generalisability	Less depth
Inductive reasoning	Can develop knowledge in an area with little prior information	Inferences from specific situations may not have significant real-world applicability	Deductive reasoning	Hypothesis creation	Relies on the original premise being correct

Specifically, my research has an exploratory sequential (three-phase) design (Figure 3).

**Figure 3**

*Exploratory Sequential Three-phase Research Design*



In **Chapter 4** (*Phase 1*), I utilise open-ended qualitative data collection and analysis that in *Phase 2* informs and develops conservation attitude themes. *Phase 3* involves quantitative testing of these conservation attitude items (**Chapter 5**) (Cresswell & Cresswell, 2018; Greene et al., 1989; Kelly & Cordeiro, 2020; O'Leary, 2017; Shorten & Smith, 2017). The quantitative phase provides closed-ended data supporting an objective exploration of possible relationships between hope, conservation attitudes, current conservation action, and future conservation intention (**Chapter 5**). Consequently, my research methodology combines the depth of knowledge, from the qualitative enquiry phase, with the breadth gained during the quantitative phase (Figure 3).

#### 1.4.1 Qualitative Phase

Conservation attitudes are individual and mediated by various factors, including personal experiences and exposure to the natural environment (Cheng & Monroe, 2012; Collado et al., 2013). Since attitudes cannot be observed directly, indirect methods are used to investigate, assess, and interpret people's thoughts (Wallen & Landon, 2020). Various methods are employed to externalise an individual's internal thoughts as attitudes, including interviewing, photo-elicitation, and collage-making (Butler-Kisber & Poldma, 2009; Roberts & Woods, 2018; Taylor & Plowman, 2010).

Collage-elicited interviewing, an arts-based methodology, enables individuals from different age groups to reflect on and externalise their world experiences by self-assigning meaning to their collage images. This tool has successfully contributed to diverse environment-associated topics, including revealing children's place attachments, children's environmental understandings, and local adult fisher involvement in policymaking (Brooks & Sorin, 2011; Chapsos et al., 2019; Sorin et al., 2012). However, CLC and conservation attitude research have

yet to utilise collage-elicited interviewing. Consequently, in my study, I adopted collage-elicited interviewing to reveal an individual's thoughts about today's world, the future, and their perceived place within those two worlds. This collage-elicited interviewing approach also enabled participants to reflect on the actions they need to take to move from today's world to the future.

In my study, each participant participated in a semi-structured conversation I facilitated as the researcher. In this interview, I utilised a series of laddering questions (de Souza Leao & Benicio de Mello, 2007) (Appendix C). Laddering questioning helps uncover participant decision-making, values, and functional and emotional benefits associated with their decisions. An external transcriber transcribed the recorded interview *verbatim*. I conducted a thematic analysis (TA) of the transcribed interviews as the researcher.

Described by Fugard and Potts (2020) as a family of methods, TA is often positioned as an experiential qualitative research methodology formalising the theme development process (Braun & Clarke, 2021a; Morrow, 2007). TA has been previously used in a range of biodiversity conservation research, including identifying social causes of project failure, citizen scientist nature engagement, and stakeholder engagement (Catalano et al., 2019; Ganzevoort & van den Born, 2019; Sterling et al., 2017).

I adopted an inductive approach called reflexive TA during the qualitative phase of my research. Reflexive TA addresses the research question by utilising people's thoughts, experiences, and perceptions to identify patterns of shared meaning underpinned by a central organising concept. Furthermore, this approach highlights data set similarities and differences, summarises key features, generates unanticipated insights, and identifies themes (Braun & Clarke, 2006, 2020, 2021a; Kiger & Varpio, 2020). Reflexive TA is thus an appropriate methodology for the current research. This approach enables the collage-elicited transcripts, based on an individual's previous and current experiences and perceptions about actions leading to a possible future, to be analysed for underlying themes related to an individual's current and future world views and their self-identified present-day to future actions. However, the researcher's interpretation of participant collage-elicited thoughts and perceptions requires researcher subjectivity. TA specifically addresses such subjectivity through six recursive phases, 1. familiarisation with the data, 2. coding, 3. generating initial themes, 4. reviewing and developing themes, 5. refining, defining and naming themes, and 6. writing up. I will address these phases in **Chapter 4**.

## 1.4.2 Quantitative Phase

A quantitative approach, unlike qualitative, enables the investigation of inter-variable relationships. This approach can also test the generalisability of qualitative research results from a wider population (Cresswell & Cresswell, 2018).

I compiled and administered a digital survey during the quantitative research phase. This time-efficient and inexpensive approach captures and stores an individual's data numerically, making such data readily available for statistical analysis (Cresswell & Cresswell, 2018; Dressler & Oths, 2015; Oppenheim, 2000).

The survey was administered over several summer months (December to February) to Aotearoa New Zealand adults in the Bay of Islands, Aotearoa New Zealand. Summertime in the Bay of Islands is a holiday period when residents and national visitors are present and may be more amenable to completing the survey. This strategy thus supplied a range of potential survey participants. The survey tested four variables, 1. adult state hope levels, 2. conservation attitudes, 3. current conservation actions, and 4. future conservation intentions.

Snyder's Theory of Hope describes hope as a cognitive trait that influences behaviour through goal-directedness and barrier-overcoming characteristics (Snyder, 2002). Hope might thus be considered a logical supporting trait for those currently active in CLC and those intending to volunteer for conservation. Consequently, this study incorporated Snyder's Adult State Hope Scale (Snyder, Harris, et al., 1991; Snyder et al., 2018).

The conservation attitude items that I developed during the qualitative phase of my research were framed as six-item Likert-like scales to facilitate participant responses, data collection and statistical analysis. The remaining two variables, current conservation action and future conservation intention were framed as conservation action questions determining survey participants' current conservation actions and future conservation intentions. Three specific biodiversity restoration actions were tested, 1. planting, 2. weeding, and 3. IAS control. These actions are the main practical volunteer contribution to ecological restoration in Aotearoa New Zealand (Peters et al., 2015).

## 1.5 Thesis Structure

My thesis is organised into six chapters. In **Chapter 1**, the current chapter, I have outlined the thesis aim and objectives. In **Chapter 2**, my literature review will provide the context for my research. **Chapters 3 to 5** consider my three research objectives; these chapters are developed from peer-reviewed manuscripts. In **Chapter 6**, the Discussion, I help address the knowledge-

action gap (Roche et al., 2021) by creating practical applications for national conservation agencies, NGOs, and local CLC groups based on my research findings. The thesis organisation is summarised by chapter content and purpose, research methods used, and associated research publication status (Table 2). My thesis aim, research question, objectives and mixed-method research design are also presented (Figure 4).

**Table 2**

*Organisation of Thesis by Chapter, Chapter Purpose Outline, Research Method Used, and Research Publication Status.*

Chapter	Outline of chapter purpose	Research method used	Research publication status
1 – Introduction	Introduce the research topic. Describe research issue. Outline research background. Propose thesis aim and research objectives. Identify thesis research design and rationale. Describe thesis organisation. Identify thesis originality and significance. Note research methods.	Literature review	N/A
2 - Literature review	Use literature to determine/verify theoretical foundations and guidelines adopted by psychology, sociology, and applied ecology research fields. Determine the research context. Describe research approaches & methods. Introduce relevant literature. Highlight current knowledge gaps.	Literature review	N/A
3 - Approaching future Aotearoa New Zealand community-led conservation	Examine existential and future scenarios from demographic database projections relating to potential barriers to volunteering in Aotearoa New Zealand. Determine the research context. Examine socio-political-economic drivers. Introduce relevant literature. Highlight current knowledge gaps.	Literature review, Open-source data analysis	Ough Dealy et al. (2022)
4 - Aotearoa New Zealand conservation attitudes	Discern conservation attitudes. Devise Likert-type conservation attitude items. Use relatively novel collage-based research methodologies allowing a broader range of participants to become actively involved. Use documented participant discourses to crystallise themes.	Literature review, Collage-elicited interviews, Thematic analysis	Ough Dealy et al. (2021)
5 - The role of hope and attitudes in current conservation actions and future conservation intentions	Determine the validity of Snyder's Adult State Hope Scale in Aotearoa New Zealand. Determine the relationship between hope and conservation attitudes. Identify the relationship between hope, current conservation action, and future conservation intention. Discuss the relevance of hope to Predator Free 2050 vision and CLC.	Literature review, Snyder's Adult State Hope Scale, Conservation action items, Conservation attitude items	Ough Dealy et al. (Under review)

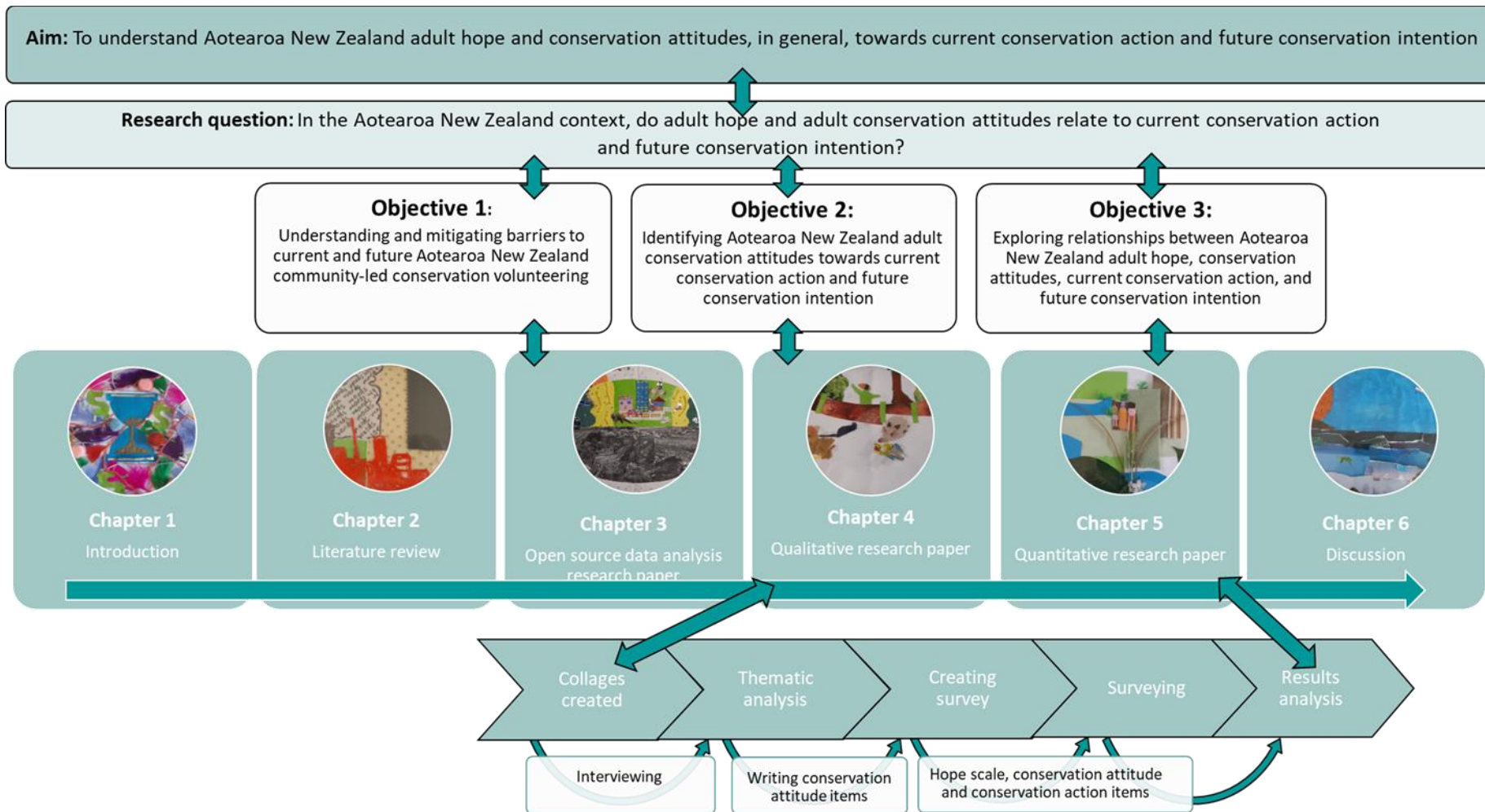
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Chapter	Outline of chapter purpose	Research method used	Research publication status
6 - Discussion	Summarise main thesis findings. Relate the main findings to the thesis aim. Address research limitations. Describe research implications and detail original contributions. Describe remaining knowledge gaps. Identify future research questions. Reduce the knowledge-action gap by applying research results to conservation practice.	Literature review, Self-reflection, Constructive critique	N/A

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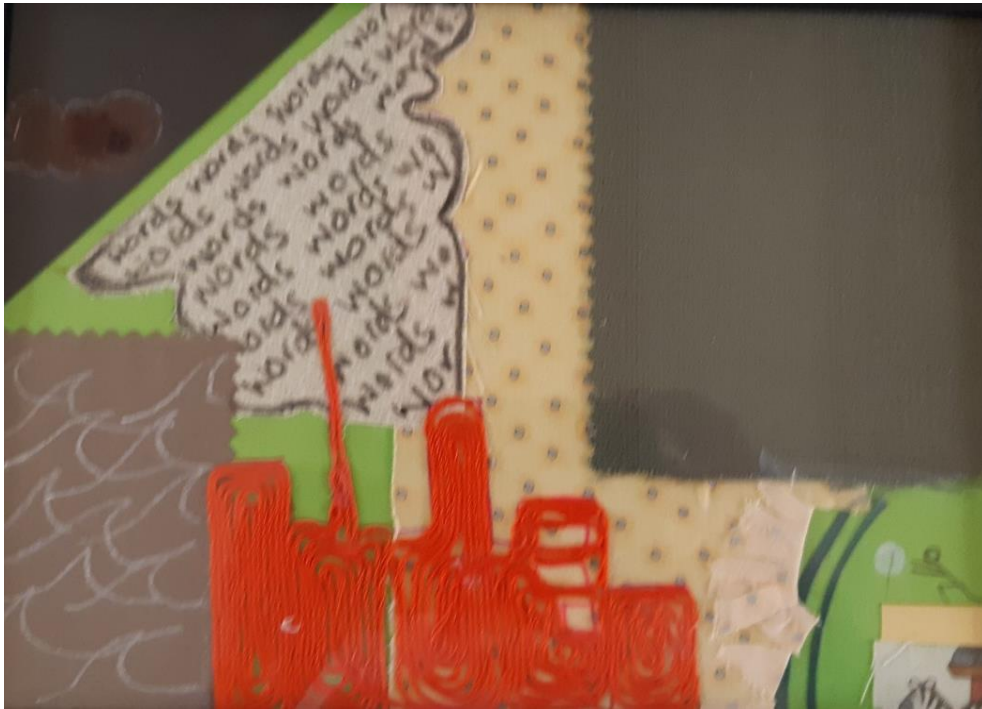
**Figure 4**

*Thesis Aim, Research Question, Objectives, and Mixed Methods Research Design*



## Chapter 2 Literature Review

*World in the Present-day*



Note. By P13001, 2019, collage, mixed media.

*World in the Future*



Note. By P13001, 2019, collage, mixed media.

## 2.1 Overview

Global biodiversity is under threat (IUCN, 2021b). The impacts of IAS and habitat loss contribute to this worldwide biodiversity decline. Community-led conservation actions support biodiversity restoration, including IAS control and habitat restoration efforts (Bennett et al., 2017). However, the long-term sustainability of CLC and its consequent impacts on biodiversity decline are unknown. At a national level, this uncertainty has implications for Aotearoa New Zealand's Predator Free 2050 vision (PF2050), a government-led biodiversity restoration goal of being predator-free by 2050 (Department of Conservation, 2020f; New Zealand Government, 2016).

In this chapter, I determine the state and factors contributing to declining international and national Aotearoa New Zealand biodiversity. I then consider international and national Aotearoa New Zealand biodiversity restoration agreements and goals addressing this decline. Subsequently, I narrow my focus to the impact of IAS and habitat loss on Aotearoa New Zealand biodiversity. I then describe Aotearoa New Zealand CLC volunteering efforts to halt biodiversity decline. Here I also consider possible barriers to CLC efforts. Following this, I identify motivational factors that may predispose an individual to become a CLC volunteer carrying out biodiversity restoration actions, including planting, weeding, and predator control. I then consider the specific potential roles of conservation attitudes and hope in an individual's current conservation actions and future conservation intentions.

I conclude **Chapter 2** with the first step to a more sustainable Aotearoa New Zealand CLC by identifying current and future CLC volunteering barriers. I explicitly address these barriers and possible solutions in **Chapter 3**.

## 2.2 Biodiversity

### 2.2.1 State of International Biodiversity

Over the past 3.5 billion years, of the estimated four billion species to have evolved on Earth, only about 1% remain today (Barnosky et al., 2011). The International Union for Conservation of Nature's (IUCN) Red List of Threatened Species provides comprehensive information about the global extinction risks of animal, fungus, and plant species. The IUCN Red List confirms that worldwide, biodiversity is continuing to decline. More than 37,400 of the 134,400 species listed are threatened with extinction, including amphibians (41%), conifers (34%), reef-building corals (33%), mammals (26%) and birds (14%) (IUCN, 2021b). However, these species extinction estimates are likely an undercount in part resulting from greater resource

availability in more developed countries and preferential assessment of forest ecosystems (Leclère et al., 2020).

The ramifications of global and more localised biodiversity loss are widespread and varied. Significant impacts include the tangible effects of impoverished species and ecosystem diversity, reduced ecological resilience, and altered ecological services benefitting humans (Chase et al., 2020; Peterson et al., 2014; Wardle et al., 2011). Furthermore, there are the less tangible, highly valued impacts of “connections with nature that help define our identities, cultures and beliefs” (Secretariat of the Convention on Biological Diversity, 2020, p. 2).

The primary drivers of human-induced biodiversity loss vary over time and by geographic region. They include overexploitation and habitat loss, climate change, and IAS introduction (Bellard et al., 2016; Leclère et al., 2020; Oliver, 2018; Spooner et al., 2018; Wilson, 2016), which has reduced mean species richness by 21% among local species (Crystal-Ornelas & Lockwood, 2020). While Leclère et al. (2020) identify habitat conversion, for example, from forest to pasture, as the largest human-initiated biodiversity threat to date, they also propose emerging threats, including biological invasions by IAS, as potentially important in the future. All taxonomic groups are represented by IAS, from viruses to mosses and higher plants, invertebrates to mammals (Invasive Species Specialist Group, 2000). These species contribute to “the irretrievable loss of native species and ecosystems” (Invasive Species Specialist Group, 2000).

### 2.2.2 International and National Biodiversity Restoration Agreements and Targets

International and national biodiversity restoration agreements and targets are interrelated. UN-mandated sustainable development goals are defined in the Convention on Biological Diversity. National biodiversity targets are implemented at the local community-led conservation level (Department of Economic and Social Affairs, n.d.; IUCN, 2021a). These protective mechanisms support conservation attempts to slow, halt or reverse biodiversity loss (IPCC, 2021).

The United Nations has designated 2021 to 2030 as the UN Decade on Ecosystem Restoration (United Nations General Assembly, 2019). This designation focuses national efforts on supporting the international cross-government Convention on Biological Diversity (CBD) (Convention on Biological Diversity, 2017). A strategic plan for achieving biodiversity conservation was established in 2010 and incorporated 20 measurable targets (Aichi Biodiversity Targets) to be met by 2020 (IUCN, 2021a). Such targets assist national progress in

measuring biodiversity loss prevention and improving benefits from biodiversity to society (Convention on Biological Diversity, 2020). However, none of these targets has been fully met. Despite progress in some areas, natural habitats continue disappearing, and many species remain threatened by extinction (Secretariat of the Convention on Biological Diversity, 2020).

Aichi Biodiversity Targets 1 (conserving biodiversity), 2 (taking greater action for the environment), 9 (identifying and controlling IAS), 12 (preventing threatened species extinction), and 19 (establishing knowledge-based biodiversity restoration) are relevant to this thesis. These targets directly relate to Aotearoa New Zealand's national biodiversity restoration goals and are addressed, in part, through voluntary CLC efforts countering the negative impacts of habitat loss and IAS. To appreciate the singular nature of that loss, it is necessary to understand the unique evolution of Aotearoa New Zealand and its flora and fauna.

### 2.2.3 State of Aotearoa New Zealand Biodiversity

Some 80 million years ago, Aotearoa New Zealand's archipelago of islands split off from Gondwanaland (Gibbs, 2016). Small, isolated islands rather than continents tend to have more species found nowhere else (endemism). The more isolated the islands, the higher the proportion of unique endemic life forms (Gibbs, 2016). The natural marine barrier isolated Aotearoa New Zealand's islands and their increasingly unique biodiversity. Consequently, Aotearoa New Zealand became a land where invertebrates were the size and weight of mice, birds had mammalian characteristics, and reptiles gave birth to live young rather than lay eggs (Gibbs, 2016). In common with other archipelagos, Aotearoa New Zealand developed a high level of species endemism, specifically 72% of birds (land, freshwater and marine); 84% of vascular plants (land and freshwater); 81% of insects (land and freshwater); 88% of freshwater fishes, and 100% of reptiles, frogs, bats (land and freshwater) found nowhere else on Earth (Department of Conservation, 2020a; Lee & Lee, 2015; Macinnis-Ng et al., 2021). Consequently, Aotearoa New Zealand has been described as a "biological hotspot" with attendant conservation priorities (Myers et al., 2000; Reid, 1998).

Isolated island species are especially vulnerable to IAS impacts (Invasive Species Specialist Group, 2000). By 2019, more than a third of Aotearoa New Zealand's surviving indigenous terrestrial species had been categorised as threatened, with, or at risk of extinction (Ministry for the Environment, 2019; New Zealand Threat Classification System, 2020). IAS and forest clearance contribute to this catastrophic biodiversity loss (Clout & Lowe, 2000; Norton et al., 2018).

Every IAS taxon (Doherty et al., 2016; Fea et al., 2021; Holdaway, 1999; Innes et al., 2010) is represented in Aotearoa New Zealand. A land described by Clout and Lowe (2000, p. 369) as “one of the most isolated and invaded places on Earth”. Aotearoa New Zealand’s endemic birds, for example, are particularly vulnerable to IAS being mainly flightless, ground-nesting, diurnal, slow-breeding and large, making them, their fledglings, and eggs desirable food targets (Anderson, 2013; Flannery, 1994; Valente et al., 2019; Worthy & Holdaway, 2002). Taking advantage of these traits, invasive alien predators such as common brushtail possum (*Trichosurus vulpecula*), ship rat (*Rattus rattus*), and stoat (*Mustela erminea*) kill over 25 million native birds a year (Hill, 2012; Innes et al., 2010). IAS's negative impacts are not confined to killing Aotearoa New Zealand’s avifauna. Possums and rats compete with fruit- and seed-eating and -dispersing birds, e.g., North Island weka (*Gallirallus australis greyi*) and kererū (*Hemiphaga novaeseelandiae*), by consuming their food sources (Carpenter et al., 2018; Norton, 2009). Thus, as Doherty et al. (2016) state, “mitigating the impact of invasive mammalian predators is essential for reducing the rate of global [and Aotearoa New Zealand] biodiversity loss.”

However, invasive mammalian predators are not the only threat. Invasive alien plant species negatively impact more than a third of Aotearoa New Zealand’s critically endangered ecosystems (Wiser et al., 2013). These impacts are widespread, from reducing native arthropod species abundance to selectively suppressing native seedling survival (Effah et al., 2020; Hulme, 2020; Nielsen et al., 2017; Norton, 2009).

Before the early 2000s, IAS management was termed pest management and regarded as a branch of wildlife ecology and agricultural science focussing on pest species' impacts on biodiversity, agriculture, and landscape (Howard et al., 2019). The human dimension of IAS control is a relatively recent area of investigation (Ballard, 2006). For example, human behaviour underpinning community action has only recently been identified as a “necessary avenue for research in the pest management context” (Ballard, 2006; Howard et al., 2019). Consequently, individual or group human behaviour has a biodiversity-enhancing pest management role (Manfredo et al., 2009).

Supporting Aotearoa New Zealand’s indigenous biodiversity can also be achieved through habitat restoration. Such native plantings occur at various scales, from nationwide enrichment plantings supported by Trees That Count through to Project Island Song, an island-based community-led habitat restoration project (Department of Conservation, 2020c; Forbes et al., 2020; Norton et al., 2018; Norton et al., 2016; Trees that count, 2021; Whitburn et al., 2019).

I have identified the need for biodiversity conservation through IAS control and ecosystem restoration. Specifically, CLC efforts (planting, weeding, and predator control) can reduce and slow Aotearoa New Zealand biodiversity loss. Concurrent with biodiversity rehabilitation efforts are ongoing protection approaches, including sustained and coordinated community action. Consequently, CLC efforts can be considered a vital component of such practical conservation solutions (Ban et al., 2013; Bennett et al., 2017; Bennett et al., 2018; Peters et al., 2015). Therefore, voluntary engagement in conservation action requires an understanding of supporting mechanisms.

## 2.3 Volunteering and Community-led Conservation

In a rapidly changing environment, volunteering is a constant, universal means by which individuals, motivated by deeply-held values and beliefs, donate time, labour, talent, and skills, often without having to be asked to do so, without coercion or expectation of payment, for the community and their own benefit (International Labour Office Geneva, 2011; United Nations, 2011; Volunteering New Zealand, 2021).

Community-led conservation is a specific subset of those who volunteer. These volunteers are diverse individuals linked by shared perspectives and social relationships who voluntarily act for the environment at particular geographical locations (McLellan et al., 2001).

In this thesis, I define *community-led conservation volunteering* as

“any community conservation project, initiative, group, or trust that focuses group volunteer community actions toward pest species management and ecological restoration”.

### 2.3.1 Aotearoa New Zealand community-led conservation

Aotearoa New Zealand CLC participation, in common with international CLC volunteering, has increased in recent years (Department of Agriculture Water and the Environment, 2020; Grant & Langpap, 2019). Peters et al. (2015) identified more than 600 Aotearoa New Zealand CLC groups. By 2017, more than 1200 community conservation groups were actively pursuing biodiversity restoration (Department of Conservation, 2017; Towns et al., 2019). However, this data is likely dated and may under-report informal conservation group efforts as these groups can be challenging to identify or enumerate (Heimann & Medvecky, 2022).

Generally, Aotearoa New Zealand’s current CLC efforts are locally focussed, self-organised, not-for-profit, non-governmental and mostly comprised of voluntary groups and individuals (Peters et al., 2015). Group size and structure may vary from relatively informal collectives to

quasi-corporate entities with formal legal structures and strategic processes (Forgie et al., 2001; Jones & Kirk, 2018). Community-led conservationists identify strongly with their local area. Often CLC group names reflect their members' social affiliation and geographical area of concern, for example, Russell Landcare Trust, Puketi Forest Trust, and Supporters of Tiritiri Matangi (Puketi Forest Trust, 2021; Russell Landcare Trust, n.d.; Supporters of Tiritiri Matangi Inc, 2010).

Conservation volunteers utilise IAS management and control to restore and protect biodiversity within the Aotearoa New Zealand context (Heimann & Medvecky, 2022; Woolley et al., 2021). Predator species most commonly controlled by CLC volunteers are the rat, possum, and stoat; also targeted are the unowned domestic or feral cat (*Felis catus*), house mouse (*Mus musculus*), hedgehog (*Erinaceus europaeus*), and ferret (*Mustela furo*) (Glen et al., 2012; Innes et al., 2023; Predator Free New Zealand Trust, n.d.). CLC volunteers utilise a range of predator removal/management methods, including low-tech rat, stoat, and possum traps and more sophisticated forms of toxin control (Bissell, 2022; K. Brown et al., 2015; Department of Conservation, 2019d; Innes et al., 2023; King & Scurr, 2013).

These groups also reintroduce endemic flora and fauna species, utilise planting and weeding to restore habitats, and carry out community-directed conservation advocacy and education (Galbraith, 2013; Peters et al., 2015). CLC groups may undertake supportive actions, such as fundraising, monitoring for reporting purposes, and administrative and governance roles (Sullivan & Molles, 2016). Volunteering can be on private or public land and support environmental and social individual volunteer goals (Guiney, 2009).

Aotearoa New Zealand CLC group activities vary in type and location: online or hands-on; individual or group; one-off, intermittent or regular; planned or spontaneous (Conservation Volunteers, n.d.-a). However, irrespective of these variations, CLC activities tend to have three aims in common: 1) predator control and, in some cases, elimination; 2) biodiversity restoration, including native plantings; and 3) endangered species reintroductions (M. A. Brown et al., 2015; Department of Conservation, 2017; Norton et al., 2016; Russell et al., 2015).

In 2019, the Aotearoa New Zealand government endorsed the Predator Free 2050 (PF2050) vision of a predator-free country by 2050 (Beehive.govt.nz, 2016); deliberate eradication of a suite of invasive alien mammalian species, the possum, stoat, and rat (Department of Conservation, 2019b). This predator-free goal is anticipated as attainable, in part, through existing and future CLC activities (Department of Conservation, 2020f).

The current availability and interest of Aotearoa New Zealand's CLC groups imply a ready source of labour, skills, and enthusiasm to make the PF2050 vision a reality. Agency assistance for CLC groups to achieve this audacious predator-free vision is emerging. In 2017, for example, the Department of Conservation created nine predator-free regional ranger roles supported by a contestable fund of NZ\$300,000 to scale up local predator control efforts by working specifically with communities and volunteer groups (New Zealand Government, 2017). Multi-stakeholder regional pathway plans supporting the PF2050 goal are under development (Department of Conservation, 2021b). Local government authorities support CLC predator control efforts through targeted rate models. Northland Regional Council, for example, has two predator control mechanisms. An annual pest management rate of 18c in the dollar directly supports community-led predator control projects across the region (Northern Regional Council, 2021). A more localised annual Whangarei Heads Pest Management Rate of \$50 is levied on Whangarei Heads ratepayers (Northern Regional Council, 2017). Similarly, Nelson City Council has adopted a rating increase through Nelson Nature. This '\$6m over 10 years' biodiversity programme supports community-conservation aspects such as individual house owner backyard trapping and local trapping groups (personal communication, Jo Martin 14 May 2021).

However, whether CLC can meet PF2050's current and future demands is uncertain. These uncertainties include a nationally ageing CLC membership, an apparent absence of viable succession planning, and urban-rural population changes. Most current community conservation volunteers are 50 years or older and unlikely to be active conservationists by 2050 (Heimann & Medvecky, 2022; Peters et al., 2015). Ban et al. (2013) also predicted that the predator control activities necessary for a predator-free Aotearoa New Zealand would require intergenerational community support. It is currently unknown whether younger Aotearoa New Zealanders will become involved in community conservation over the next three decades and beyond. Current and projected demographic changes may contribute to uncertain CLC volunteer involvement. For example, while almost 87% of Aotearoa New Zealand's population live in urban areas (O'Neill, 2021b), most public conservation land is rurally situated (Department of Conservation, n.d.-a). Rural populations, by 2050, are projected to be older and reduced in number (Stats NZ, 2021b). Young (2004) foreshadowed the impacts of this issue, "If there is no community, there will be little conservation, while conservation needs individuals for leadership, it requires communities for action."

Based on these factors, I question whether CLC, as currently supported by national and regional government and NGOs, will provide a sustainable mechanism for achieving a

predator-free Aotearoa New Zealand by 2050. In chapter 3, I address these concerns and suggest CLC volunteer recruitment and retention mitigation strategies.

Natural processes underpin biodiversity restoration. These processes are not static. Replanting an area with 'nursery' species (e.g., mānuka (*Leptospermum scoparium*), kānuka (*Kunzea ericoides*)) is a first step towards establishing a climax forest (Tulod & Norton, 2020). Ongoing planting, weeding, and predator control are necessary to restore biodiversity. Consequently, the long-term success of CLC projects relies on the current conservation actions and future conservation intentions of present-day and future volunteers (Ban et al., 2013).

In the following sections, I consider the association of CLC biodiversity restoration with three research areas, 1. current conservation action and future intention to act, 2. conservation attitudes, and 3. hope. These themes help address my primary research question, "In the Aotearoa New Zealand context, do hope and conservation attitudes relate to current conservation action and future conservation intention?".

## 2.4 Current Conservation Actions and Future Conservation Intentions

Current and likely future environmental challenges to biodiversity health demand research that identifies contributing factors and promotes robust solutions (Clayton & Saunders, 2012). Therefore, CLC biodiversity restoration will likely benefit from an enhanced understanding of factors contributing to current conservation action and future conservation intention.

Volunteering exists within a social context and entails enduring psychological traits (Ackermann et al., 2014; Joy, 2020). Hines et al. (1987) environmental behaviour model identified the interplay of cognitive and personality variables. Bamberg and Möser (2007) replicated and extended Hines et al.'s 1987 meta-analysis by assessing psychological action theories concerned with the interactions influencing an individual's decision to behave pro-environmentally (e.g., Meinhold & Malkus, 2005; Ren et al., 2022). Diverse external and internal social-psychological factors may influence conservation actions; external (e.g., demographic, economic, social and cultural), and internal (e.g., motivation, pro-environmental knowledge, awareness, values, **attitudes**, emotion, locus of control, responsibilities and priorities) (Bamberg & Möser, 2007; Hines et al., 1987; Klöckner, 2013; Kollmuss & Agyeman, 2002).

An individual's pro-environmental behaviour does not stand apart from these external or internal influences. Rather, social (external) and personal (internal) factors shape an individual's conservation behavioural responses. Social factors may encompass economic and social pressures, urban or rural residence, access to the natural environment, and cultural

values. Non-environmental goals such as saving money or mental/physical health improvement may also be among the root causes influencing pro-environmental behaviour. Personal factors may also influence pro-environmental behaviours, e.g., childhood experiences with the natural world, education and environmental knowledge, age, gender, life goals, sense of control, values, place identification and attachment, and personal values (Gifford & Nilsson, 2014; Kollmuss & Agyeman, 2002; Park et al., 2020; Siegel et al., 2018).

## 2.5 Attitudes and Community-led Conservation

Evaluation pervades and influences everyday life (Kansky et al., 2014). Evaluating our environment regarding whether to engage with or avoid situations enables individuals to avoid a chaotic and possibly brief existence (Fazio & Olson, 2003). Consequently, the attitude concept has been, for decades, the centre of environmental psychology attempts to predict and explain human behaviour (Clayton & Saunders, 2012; Fishbein & Ajzen, 2010).

One social-psychological factor influencing conservation action is attitudes (Bamberg & Möser, 2007). Attitudes have been defined as an individual's disposition or tendency to respond to a psychological object external to themselves (Fishbein & Ajzen, 2010). This positive or negative focus may be towards a concrete or abstract attitude object, e.g., a person or an inanimate item, idea, location, event, behaviour or issue (Allport, 1954; Breckler, 1984; Fishbein & Ajzen, 1975; Gifford & Sussman, 2012; Heberlein, 2012; Hunter et al., 1976; Kollmuss & Agyeman, 2002).

Attitudes can be based on past experiences, persist over time, and are relatively stable (Breckler, 1984; Rosenberg & Hovland, 1960). Human dimensions of wildlife management research, specifically attitudes, have been extensively explored (Manfredo et al., 2009).

### 2.5.1 Environmental Attitudes

Initially, environmental attitudes were considered a unidirectional construct describing an attitude ranging from unconcern to environmental concern (Dunlap et al., 2000). Further development of this construct incorporated two aspects, 1. ecocentrism (valuing nature for its own sake) and 2. anthropocentrism (valuing nature for its human-related benefits) (Thompson & Barton, 1994). More recently, a multi-dimensional construct has emerged, embracing egoism (concern for self), altruism (concern for other people), and biospherism (concern for the natural world) (Schultz et al., 2005). Research suggests that these three attitudinal components may support two higher-order factors, preservation (protecting biodiversity from human impacts) and utilisation (accepting human use of the natural world) (Gifford & Sussman, 2012; Milfont & Duckitt, 2010).

Conservation-related attitudes can be understood through the ABC Model's three components, affective, behavioural, and cognitive (Eagly & Chaiken, 1998, 2007; Milfont, 2007). The first component, *affective*, entails feelings or emotions about the object (e.g., I enjoy being among native trees). The second component, *behavioural*, implies a willingness to act (e.g., I will plant native trees this winter). The third component, *cognitive* or thinking about an object, usually includes an evaluation (e.g., I believe planting native trees will help protect native species). Recent Aotearoa New Zealand conservation attitude research includes these attitude components, 1. *affective*, attitudes towards gene drive as a pest control tool; 2. *behavioural*, prioritising protective actions for the marine environment and 3. *cognitive*, determining tourist comprehension of eco-sanctuary biodiversity (Esvelt et al., 2015; Howard, 2021; MacDonald et al., 2020; Zhang et al., 2021).

Attitudes concerning the environment do not differ notably from other attitude types (Cruz & Manata, 2020). Consequently, they can be defined and organised similarly, where specific environmental topics reflect a broad concern (Dunlap & Jones, 2002). For example, holding an attitude supportive of a CLC predator control project might be part of a broader intent for a predator-free New Zealand by 2050 and more widely applied to biodiversity restoration and endangered species protection.

The Hines et al. (1987) meta-analysis indicates a significant correlation between pro-environmental attitudes and pro-environmental behaviours ( $r=.38$ ). Bamberg and Möser (2007)'s more recent metanalysis expanded on and updated Hines et al. (1987) work, identifying pro-environmental behavioural intention as mediating the impact of all other psycho-social variables (27% explained variance). However, the link between environmental attitudes and behaviours is contested (Gifford & Sussman, 2012; McCleery et al., 2006; Siegel et al., 2018). Some researchers suggest a positive link, where attitudes may influence action (Alcock et al., 2020; Bamberg & Möser, 2007; Chaiklin, 2011; Ernst et al., 2017; Gosling & Williams, 2010; Hines et al., 1987; Klöckner, 2013; McCleery et al., 2006; Schultz, 2011). While other researchers are less supportive, advocating for observational evidence supporting the attitude-behaviour link (Nilsson et al., 2020; Swaisgood & Sheppard, 2011).

Recent international research supporting the attitude-pro-environmental intention link includes positive attitudes towards koalas predicting native vegetation restoration landowner behaviour (Fielding et al., 2022); farmer attitudes towards environmental and water quality degradation reduction positively affecting farmer intention to adopt protective wetland practices (Lang & Rabotyagov, 2022), and global citizenship attitudes among millennials predicting environmental volunteering participation (Woosnam et al., 2019), and urban

resident attitudes and practices regarding wildlife predation by pet cats (Hall et al., 2016). Aotearoa New Zealand conservation-related attitude/intention research include island resident, urban dweller, conservationist, the general public, and animal protectionist attitudes towards non-native wild and feral mammal control, including cats, rats, stoats, brushtail possums, and rabbits (Aley & Russell, 2019; Farnworth et al., 2014; Kikillus et al., 2016).

Klößner's (2013) meta-analysis of environmental behaviour models identifies that intention to act directly predicts behaviour. Attitudes, personal and social norms and perceived behavioural control predict behavioural intentions. In brief, environmental attitudes influence behaviour that either increases or decreases environmental quality (Cruz & Manata, 2020; Gifford & Sussman, 2012). Thus, researching future conservation intentions is vital to ongoing biodiversity restoration efforts.

## 2.5.2 Conservation Attitudes

My research concerns specific conservation actions and future conservation intentions (e.g., planting, weeding, and predator control) by CLC volunteers. Hence, I use the term 'conservation' attitudes rather than the broader term 'environmental attitudes'.

Volunteer action in the present day and intentions to continue such conservation acts into an unknown future are vital components in successful CLC projects. Conservation attitudes are motivational drivers underpinning such actions. Thus, community-led biodiversity restoration necessitates understanding conservation volunteer attitudes and their role in future conservation intention (Bennett et al., 2017; Díaz et al., 2019; Dietsch et al., 2020; Ganzevoort & Van Den Born, 2020; Heimann & Medvecký, 2022; Mascia et al., 2003; Saunders, 2003). However, measuring such attitudes is not necessarily straightforward.

### 2.4.2.1 Measuring Conservation Attitudes

Conservation attitudes are not directly observable or measurable latent constructs (Himmelfarb, 1993). They are inferred from overt responses generally gathered through direct self-report methods (e.g., interviews and surveys) (Himmelfarb, 1993; Kaiser et al., 2018; Krosnick et al., 2005; Kyle et al., 2020; Milfont & Duckitt, 2010). Many environmental attitude measurement tools have been created based on various conceptual and theoretical frameworks. Researchers have often generated new measures rather than utilising those already available (Cruz & Manata, 2020; Dunlap & Jones, 2002; Milfont & Duckitt, 2010). Consequently, choosing the most appropriate measurement scale can be difficult. Environmental attitude scales include the New Ecological Paradigm measuring limits to human population growth, anti-anthropocentrism, and ecological damage (Dunlap et al., 2000); the

Environmental Concern Scale focussing on conservation and pollution issues (Weigel & Weigel, 1978), and the Environmental Attitudes Inventory measuring attitudes towards enjoying nature, supporting interventionist conservation policies, environmental movement activism, anthropocentric concern, and confidence in science and technology (Milfont & Duckitt, 2010).

Currently, scales measuring attitudes supporting action and intention to act for conservation, thus supporting biodiversity restoration, are underrepresented. Additionally, conservation attitudes do not operate in isolation; they are impacted, for example, by personal experience and subjective attributions (Wong-Parodi & Berlin Rubin, 2022). A first step in addressing this measurement gap is investigating an individual's attitudes about the world they currently inhabit and the future environment they anticipate occupying, as well as the behavioural strategies they might adopt to move from the current world to that of the future.

I address this attitude measurement tool gap in several ways. In **Chapter 4**, I develop a conservation attitude elicitation technique based on subjective personal experiences. Subsequently, I form conservation attitude items based on the attitudes elicited. In **Chapter 5**, I test these conservation attitudes relating to current conservation action and future conservation intention on the general adult Aotearoa New Zealand public, potential and actual CLC volunteers.

Current conservation action and future intention to act depend on achieving short-term and long-term goals. The primary determinant for goal achievement has been described as an individual's agentic behaviour, as expressed in Snyder's Theory of Hope Theory and Bandura's self-efficacy theory (Bandura, 1977, 1997; Snyder, 2002). Thus, the following section explores the possible relationship between hope, self-efficacy, conservation action, and future intention to act.

## 2.6 Hope

Hope is complicated. This section explores the complexities and varying definitions of hope and the related concepts of optimism and self-efficacy. I then focus on the particular relevance of Snyder's Theory of Hope to conservation action and future conservation intention. Finally, I consider hope measurement tools in relation to community-led conservation.

Philosophers, theologians, and poets were the leading explorers of hope's structure and value in earlier times. Hope has been construed as a virtue, a passion, a belief, a disposition, an affect, a motivational attitude, an emotional state, a personality trait, and a life force (Bloeser & Stahl, 2017; Blöser, 2020; Descartes, 2015; Dufault & Martocchio, 1985; Govier, 2011; Lazarus, 1999; Park et al., 2020; Slezackova, 2017; C R Snyder et al., 2002; Staats & Stassen,

1985; Stotland, 1969). Hope has also been described as self-empowering, even transcendent, bringing the individual closer to their ultimate goals and spirituality (Knight, 2013; Slezackova, 2017).

By the late 1990s, hope emerged as a vital construct within positive psychology (Snyder et al., 2018), the scientific study of what makes life most worth living. Positive psychology is concerned with optimal human functioning while exploring an individual's strengths and weaknesses (Linley et al., 2006; Peterson, 2018). Seligman (2004) further characterised positive psychology as finding purpose, intrinsic motivation, character development, self-directed learning, and preparation for the future.

Hope has been variously described as a multi-faceted, multi-dimensional cognitive construct (Dufault & Martocchio, 1985; Lopez et al., 2003; Slezackova, 2017; Staats & Stassen, 1985). Other researchers consider hope a unidimensional construct (Khodarahimi, 2013; Metzler et al., 2022; Nel & Boshoff, 2014).

Common themes attributed to hope involve a future-focussed intentional act to attain an important goal, positive expectations for the future, and implied possible, although uncertain, success through personal efforts (Averill et al., 1990; Downie, 1963; Ehrenfeld, 2009; Frumkin, 2022; Gasper et al., 2020; Orr, 2004; Snyder, 2000).

Hope appears to be a universal construct available to all to access and develop (Edwards & McClintock, 2018). There appear to be no significant differences in hope between genders (Snyder, 2002) or across the life course (e.g., adolescents, emerging adults, and adults) (Bronk et al., 2009). However, people from different cultures use and conceptualise hope differently (Lopez et al., 2003). Thus, understanding hope within the cultural context is vital (Constantine & Sue, 2006; Sandage et al., 2003; Sue & Constantine, 2003). Individuals can be positioned along a high-hope to low-hope continuum. However, this position is not static. As a person achieves their goals, hope rises; hope diminishes with repeated lack of goal achievement (Snyder, 2002). Greater hope levels also predict increases in problem-solving and goal-seeking behaviour (Chang, 1998; Chang & DeSimone, 2001).

### 2.6.1 Snyder's Theory of Hope

Initially, Snyder, Irving, et al. (1991, p. 287) defined hope as a "positive motivational state ... based on an interactively derived sense of (a) agency; (goal-oriented energy) and (b) pathways (planning to meet the goals)". These necessary components of hope are also described as "willpower" (agency) and "waypower" (pathways) (Snyder, Harris, et al., 1991). Hopeful individuals employ willpower to initiate and continue their efforts towards achieving their

anticipated goals. Waypower enables a hopeful person to adopt multiple ways of achieving their goals.

Snyder (2000) expanded the hope concept to include barriers (obstacles associated with pathways) that may prevent goal achievement while facilitating the development of new goal-oriented pathways. For example, having willpower but lacking the necessary skills or knowledge may frustrate and limit the chances of achieving the intended goal, thus lowering hope. Lacking the determination to overcome barriers to goals while having the means and abilities needed may also undermine goal achievement, thus lowering hope due to a lack of pathways. Pathways thinking may also entail ongoing goalsetting, resetting, re-goaling pathways, potentially discarding earlier conceived pathways and goals and opting for alternate replacement pathways and goals. Thus, both willpower and waypower are necessary prerequisites for goal achievement (Gwinn & Hellman, 2022).

As framed by Snyder's Theory of Hope, hope is not an emotion but primarily a motivational process with secondary affective responses (Snyder, 2000, 2002). Thus, hope is a future-oriented, concrete objective, goal-focused cognition utilising personal agency to achieve possible success (Downie, 1963; Lazarus, 1999). Hope is not wishful thinking but "clear-headed engagement with our capacities as they are, geared to bringing those capabilities to where we want them to be." (Snyder, 2000, p. 17). A hopeful person lives their life with one foot in the present day, the other firmly placed in the future, their eyes focused on achieving specific goals. In summary, hope is a positive motivational state where an individual's agentic sense enables them to attain desired achievable (but not certain) objectives by engaging in behaviours that overcome barriers to these goals (Bloeser & Stahl, 2017; Park et al., 2020; C R Snyder et al., 2002).

## 2.6.2 Hope and Self-efficacy

The concept of a hopeful person having the will to use ways to achieve goals is similar to Bandura's concept of self-efficacy (1977; 1982; 1997). Self-efficacy, as with hope, is based on an individual's perception of their capability. However, there are significant differences between self-efficacy and hope theory. As Magaletta and Oliver's (1999) empirical research into relationships between hope, self-efficacy, and well-being highlights, hope and self-efficacy are separate constructs. While goal achievement is central to both, the goal type differs. Goals gained through self-efficacious behaviour are situation-specific, while those hoped-for objectives are 'enduring, cross-sectional, situational, goal-directed, or all three' (Snyder, 2002, p. 257). Self-efficacious thinking involves outcome expectancy and analysis of specific goal-associated attainment contingencies. Hopeful thinking incorporates the individual self-

analysing their ability to “produce workable plans required to reach one’s goals” (Bronk et al., 2009).

Self-efficacy also differs from hope theory in the individual’s evaluation of their capability to act. Efficacious perceptions involve the individual believing they **can** act; hopeful thinkers combine an ability to act with the desire to do so. Thus, hopeful people **will** act. An individual’s current conservation actions and future intentions to act contribute significantly to biodiversity restoration. Consequently, I chose to explore the relationship between hope, conservation action and future intention to act rather than self-efficacy for this thesis.

### 2.6.3 Hope and Optimism

Optimism and hope are two constructs that tend to be conflated, particularly in everyday language (Conservation Optimism, 2022; McAfee et al., 2019; Park et al., 2020). Before considering the role of hope in CLC, it is necessary to acknowledge the similarities and differences shared by optimism and hope (Alarcon et al., 2013; Frumkin, 2022; Magaletta & Oliver, 1999; Peterson, 2000). Optimism, as with hope, is a generally stable personality trait influencing goal-directed behaviours affecting goal achievement of desired rather than undesired future outcomes. (Alarcon et al., 2013; Carver & Scheier, 2002; Gallagher & Lopez, 2009; Snyder, Harris, et al., 1991). Both are positive cognitive constructs and help explain situational behaviours (Carver & Scheier, 2002; Snyder, 1995).

Hope and optimism, however, differ in two significant aspects, 1. event dependency and 2. personal control. Firstly, optimism can be event-independent, while hope is event-specific. An optimist has a generalized expectation for future positive outcomes without considering the personal control affecting those outcomes (Carver & Scheier, 2002). For example, Bressan et al. (2017) define optimism as “an individual's confidence in a good outcome”. However, while an optimistic person anticipates effortless success, a hopeful person is “actively engaged in defying the odds or changing the odds” (Orr, 2007). For example, where an optimistic person might wish for weed-controlled native forest habitats, a hopeful individual identifies and participates in specific weeding events necessary to support biodiversity restoration. Secondly, while optimism lacks goal-directed agency or personal control, hopefulness engages the individual in planning and working towards a goal. For example, hopeful individuals focus on practical steps they will take to achieve concrete outcomes such as a weed-free habitat. An optimistic person may consider weeding beneficial without necessarily identifying nor engaging in the steps needed or who will take them. As Alarcon et al. (2013, p. 822) state, “...the optimistic person believes that somehow—either through luck, the actions of others, or one’s own actions—that [their] future will be successful and fulfilling. The hopeful person, on

the other hand, believes specifically in [their] own capability for securing a successful and fulfilling future.”

Snyder’s Hope Theory also better ‘fits’ conservation action motivations as goals are achieved through strategy (pathway) generation (e.g., I can and I will use a range of weeding strategies) (Gallagher & Lopez, 2009; Snyder, 2002).

Snyder’s Hope Theory emphasises a person’s agency in relation to capabilities and outcomes (Gallagher & Lopez, 2009). Research indicates that hope supports individual behavioural outcomes, including responsible financial behaviour, improved well-being in everyday life and during crises, and positive educational achievement (Possebon, 2010; Slezackova, 2017; Wagner & Ruch, 2015). The role of hope in supporting individual climate change actions has been extensively studied (Birdsall, 2020; Hornsey & Fielding, 2016; Ojala, 2007; Ojala, 2012, 2017). However, hope’s role is relatively under-investigated in the pro-environmental behavioural area of conservation action and intention to carry out conservation action (Ogden, 2016). Consequently, I explore the relationship of hope rather than optimism with conservation action and future intention to act.

#### 2.6.4 Hope and CLC

CLC relies on volunteers actively restoring biodiversity through current actions and future intentions to act. Such community conservationists establish and maintain habitats in the present day for a future they may not experience. Furthermore, those with future restoration intentions are committed to acting for an unknown outcome. Hope, an anticipatory intention, may thus mediate current conservation action and future intention to act.

Hope and conservation actions, whether current or intended, are under-researched. However, climate change activism, a related field to conservation action (Love-Nichols, 2020), indicates that feeling hopeful strongly and positively predicted climate action intentions, particularly when individuals were contemplating taking action in public (Brosch, 2021; Geiger et al., 2021). Feeling hopeful about taking such action is vital to acting. For example, van Zomeren et al. (2019) suggest that hope is an emotion-focused coping function helping people feel better about their current circumstances. Specific examples supporting hope’s influence on climate change activism include environmentally beneficial educational initiatives, imitating green behaviour, and attitudinal change (Babutsidze & Chai, 2018; Birdsall, 2020; Li & Monroe, 2015; Li, 2016; Li & Monroe, 2017; Ojala, 2007; Ojala, 2012, 2015, 2017). Increased policy support and political engagement related to climate change, rising from social phenomena such as seeing others act, was also linked to hope (Marlon et al., 2019).

Measuring an individual's hopefulness is the first step to understanding the links between hope, conservation action, and intention to act for conservation.

### 2.6.5 Measuring Hope

In common with attitudes, hope is a latent construct (Kyle et al., 2020). Reliable, valid measurement tools enable latent constructs to become visible and measurable. Scales often measure constructs such as hope in relation to sustaining physical exercise, life satisfaction, and academic success (Anderson & Feldman, 2020; Bailey et al., 2007; Dixon, 2019).

Redlich et al. (2018) systematically reviewed hope scale psychometric properties. The most used scale was Snyder's Hope Scale (46%), followed by the Herth Hope Index (16%). All other scales (n = 16) came from less than 10% of the papers evaluated. Community-led conservation relies on current conservation action and future conservation intention. Such efforts depend on volunteers demonstrating current and future goal-directed, agentic behaviour, such as ridding an area of predators by carrying out specific trap-setting, -maintaining, and -clearing actions. Thus, the hope measurement tool chosen for this thesis must reflect the will to pursue goals (agency) and the ways (pathways) to attain goals effectively. Furthermore, the chosen instrument would attempt to determine situations and circumstances among a general adult Aotearoa New Zealand population when hope's effects may be less pronounced. Thus, hope's boundaries are more identifiable (Edwards & McClintock, 2018, p. 361).

Two hope measurement instruments have emerged from Snyder's Theory of Hope, the Adult Dispositional Hope Scale (ADHS) and the Adult State Hope Scale (ASHS) (Snyder, Harris, et al., 1991; Snyder et al., 1996). ADHS measures an individual's general hopefulness disposition at any given moment; the ASHS, developed from the ADHS, measures ongoing goal-directed thinking (Snyder et al., 1996). Thus, ASHS focuses on goals an individual has under immediate consideration (Gallagher & Lopez, 2018; Rose & Sieben, 2018). The ASHS instructions reflect this focus directing respondents to "consider what is going on in their lives at the moment" and to estimate, on a Likert-type scale, how hopeful they are in the "here and now" (Snyder et al., 1996).

The relationship between the cognitive trait, hope (agency and pathway thinking (Snyder, Harris, et al., 1991)), attitudes, and behaviours, has been under-researched (Pleeging, van Exel, et al., 2021; Uitto et al., 2015). In particular, the unexplored relationship between hope and conservation attitudes to current conservation action and future conservation intention. Consequently, given the emphasis of this thesis on the relationships between hope, current

conservation action and future conservation intention, the ASHS was selected as the more appropriate individual differences hope measurement instrument.

The ASHS has high levels of internal validity (0.74) and reliability ( $\alpha = 0.82$  to 0.95) and test-retest reliability (0.80 for a 10-week period) (Snyder et al., 1996). This instrument has been tested with adults across various countries, including the United States, Colombia, South Africa, and Malaysia (Abdullah et al., 2018; Counted et al., 2020; Snyder et al., 1996), and in languages other than English including Malay, Portuguese, and Arabic (Abdel-Khalek & Snyder, 2007; Abdullah et al., 2018; Marques et al., 2009). However, only a few Aotearoa New Zealand-based studies have used Snyder's ASHS measurement instrument. These include the organisational resilience of post-2016 Kaikoura Earthquake tourism business operators and coping mechanisms exhibited by secondary school student climate change activists (Birdsall, 2020; Fang et al., 2020). Therefore, this thesis adds to hope measurement knowledge, specifically as measured by the ASHS, within the Aotearoa New Zealand context (McIntyre & Milfont, 2016). This thesis also addresses a global research gap, the possible role of hope in CLC volunteering, particularly current conservation action and future conservation intention in three areas: planting, weeding, and predator control.

## 2.7 Summary

This thesis addresses two critical gaps in conservation theory and practice. Firstly, investigating the potential role of hope and conservation attitude in current conservation action and future conservation intention. Secondly, developing CLC volunteer retention and recruitment resources and approaches utilising hope and conservation attitudes.

Chapter 2 established CLC as a vital factor supporting volunteer restoration of current and future Aotearoa New Zealand biodiversity. In this chapter, I provided evidence of possible beneficial relationships between current conservation action, future conservation intention, conservation attitudes, and hope. The remainder of my thesis identifies and then explores these relationships within an Aotearoa New Zealand context. Thus, in **Chapter 3**, I consider the projected age-related, economic, and social demographic challenges impacting an individual's current conservation actions and future conservation intentions. In **Chapter 4**, I develop a conservation attitude elicitation methodology. Finally, in **Chapter 5**, I test two previously under-researched conservation volunteering concepts. Firstly, adult conservation attitudes, incorporating attitudes elicited in **Chapter 4**, and secondly, Snyder's ASHS measurement instrument relating to current conservation action and future conservation intention (e.g., planting, weeding, and predator control).

Finally, in **Chapter 6**, I will develop approaches and resources incorporating conservation attitude and hope constructs. These applications support conservation volunteer retention and recruitment approaches of CLC groups, conservation-related government agencies, and NGOs, thus increasing the likelihood of successful biodiversity restoration outcomes.

In **Chapter 3**, I establish the projected demographic 'landscape' within which Aotearoa New Zealand adults volunteer for future conservation actions. In this chapter, I consider various projected barriers to CLC volunteering and suggest practical approaches to overcoming these impediments.

## Chapter 3 Using Open-Source Aggregated Data to Understand Future Community-Led Conservation

*World in the Present-day*



Note. By 8env002, 2019, collage, mixed media.

*World in the Future*



Note. By 8env002, 2019, collage, mixed media.

In **Chapter 3**, I will identify and then analyse projected barriers to community-led conservation, thus achieving my first research objective:

*Objective 1: Understanding and mitigating barriers to current and future Aotearoa New Zealand community-led conservation volunteering*

To achieve this objective, I consider a range of national and international open-source aggregated data sources to support my thesis that there are substantial barriers in Aotearoa New Zealand, to current and intended CLC. Firstly, I identify the most appropriate current and projected demographic data sources. Secondly, I consider the implications of demographic challenges to current conservation action and future conservation intention. Thirdly, I suggest mitigations to such challenges. Finally, I connect these challenges and solutions to Aotearoa New Zealand's national predator-free vision, Predator Free 2050. Consequently, this chapter helps establish the context for developing practices supportive of community-led conservation (**Chapters 4 to 6**).

A version of this chapter has been published as Ough Dealy, H.R., Jarvis, R.M., & Petterson, M. (2022). Who will be New Zealand's Community Conservationists by 2050? Using open-source aggregated data to understand future community-led conservation. *New Zealand Population Review*, 48. 78–119 [https://population.org.nz/wp-content/uploads/2022/12/Dealy\\_formatted.pdf](https://population.org.nz/wp-content/uploads/2022/12/Dealy_formatted.pdf) .

## 3.1 Abstract

Introduced mammalian predators threaten Aotearoa New Zealand's endemic species. Predator Free 2050 (PF2050) espouses a rat-, mustelid-, possum-free Aotearoa New Zealand, by 2050, achieved partly through community-led conservation (CLC). In this chapter, I examine Aotearoa New Zealand conservation volunteer participation at different life stages based on national open-source demographic data and national and regional attitudinal and conservation action data. The projected data suggest an ageing, more diverse population; changing urban/rural population ratios; increased financial debt extending to later ages; extended time in employment, and for some, work insecurity. Such barriers may reduce future active regular conservation volunteering, thus limiting CLC group sustainability. I challenge PF2050's promotion of existing CLC to support its aims. This chapter suggests ways for Aotearoa New Zealand's current 'hands-on' CLC group model and associated funding to remain relevant and resilient.

## 3.2 Introduction

### 3.2.1 A Volunteering Nation

Aotearoa New Zealand is a nation of volunteers. One in two New Zealanders is involved in formal or informal non-paid work (Stats NZ, 2018b). In 2018, more than 20% of the population volunteered their time, effort, and skills to 115,770 voluntary and community sector organisations (Volunteering New Zealand, 2020). The same year, Aotearoa New Zealanders contributed 159 million volunteer hours valued at \$4 billion, 2.8% of the national GDP (Stats NZ, 2018b; Volunteering New Zealand, 2020).

However, volunteering in Aotearoa New Zealand is changing. Between 2013 and 2018, volunteer numbers decreased from 1,229,054 to 1,008,000 and hours volunteered increased from 157 million to 159 million, indicating fewer people are volunteering more time (Stats NZ, 2018b). During the same period, not-for-profit employee numbers increased by 10%, from 136,750 to 150,630 (Stats NZ, 2018b). While these data suggest increasing professionalisation in the voluntary sector, more than 85% of not-for-profit environmental institutions, for example, remain solely reliant on volunteers, with only 4% employing six or more people (Stats NZ, 2018b).

Volunteer-involving organisations are concerned for their future. More than 35% of volunteer-involving organisations responding to the annual Volunteering New Zealand (2020) survey identified the potentially negative impacts of an ageing volunteer workforce on their future operations. Other concerns included the "ongoing challenge of making the volunteering

landscape more diverse and inclusive” (Volunteering New Zealand, 2020, p. 9) and the lack of younger people volunteering. Community-led conservation (CLC) biodiversity restoration groups are similarly uneasy (Peters et al., 2015). This apprehension is well-founded as Aotearoa New Zealand biodiversity faces a precarious present and uncertain future.

### 3.2.2 New Zealand’s Vulnerable Biodiversity

More than 4000 of Aotearoa New Zealand’s critically endangered or naturally uncommon native species are threatened with extinction by introduced predators, climate change and habitat loss (Department of Conservation, 2019c, 2020e; Parliamentary Commissioner for the Environment, 2017). Habitat loss is multifactorial. Human-induced land-use changes (Chase et al., 2020), climate change leading to increased fire risk (Kelly et al., 2020), and the negative impacts of IAS (Bellard et al., 2021), are some of the contributing factors. In response to the latter, in 2019, the Aotearoa New Zealand government mandated the Predator Free 2050 (PF2050) vision of a predator-free country by 2050. This vision is expected to be achieved through the deliberate eradication of the Australian brushtail possum (*Trichosurus vulpecula*), mustelids (*Mustela ermine*, *M. nivalis*, *M. furo*), and three species of rat (*Rattus exulans*, *R. norvegicus* and *R. rattus*) (Department of Conservation, 2019b).

PF2050 has assumed that the predator-free vision will be attained, in part, through existing and future community-led conservation (Department of Conservation, 2019c). I define community-led conservation (CLC) in this thesis as any community conservation project, initiative, group, or trust focusing on community actions towards predator species management and ecological restoration.

This chapter considers the potential impact of a changing human population on future New Zealand CLC. Investigating current and projected national and regional New Zealand demographic and non-demographic aggregated data sets might assist policy and investment decision-making (Cook, 2018), thus contributing to a more resilient CLC.

#### Demographic data and data sources

Increasingly, Aotearoa New Zealand’s CLC group efforts contribute to landscape-scale conservation (Peltzer et al., 2019; Towns et al., 2019). National and regional aggregated dataset projections may suggest population scenarios affecting future conservation volunteering. Such projections could develop ways of supporting volunteering to achieve conservation outcomes, including predator control.

In this chapter, I consider the potential impact of Aotearoa New Zealand’s changing human population on future CLC (Department of Conservation, 2020f). I examine current and

projected national and regional Aotearoa New Zealand demographic and non-demographic aggregated datasets, specifically, projected age and diversity profiles, environmental attitude and conservation action commitment information, employment and debt status, and urban/rural residency (Table 3). I chose these data sources as they are inexpensive, accessible, transparent, utilise large sample sets, and adhere to randomised survey participant sampling methodology (Johnston, 2014; O'Leary, 2017).

I then conclude Chapter 3 by discussing how such information might assist policy and investment decision-making (Cook, 2018), thus contributing to a more resilient CLC capable of supporting the PF2050 vision from wish to fulfilment.

### 3.3 Methods

#### 3.3.1 Study Design

A Google keyword search using terms including 'world population statistics', 'New Zealand population statistics', 'Predator Free 2050', 'Department of Conservation' and 'volunteers' highlighted potential datasets. Data sources included international (United Nations (UN)), national (Stats NZ; Aotearoa New Zealand's Department of Conservation (DOC); Volunteering New Zealand (VNZ)) and regional (Waikato Regional Council (WRC)) datasets. Such datasets supported researcher credibility, data authenticity and relevance to the research questions and information currency limitations (Johnston, 2014; O'Leary, 2017) (Table 3).

The UN addresses "inherent uncertainty in population projections" by adopting trends with a 95 per cent probability. This "medium variant... is considered the most likely trend of population change." (United Nations, 2017). For consistency, I adopted the same approach when considering Aotearoa New Zealand population data trends (Stats NZ, 2017a).

**Table 3***Aggregated Dataset Source, Focus, Sample Size, Representativeness, and Limitations*

<b>Dataset name and year</b>	<b>Data source</b>	<b>Focus</b> N=National R=Regional	<b>Sample size (n)</b> I=Individual H=Household O=Organisation	<b>Representativeness Update</b> <b>frequency</b>	<b>Data limitations</b> P=pre-COVID-19 M=mid-COVID-19
<b>NZ Census (2013 and 2018) (Statistics New Zealand, 2014; Stats NZ, 2020a)</b>	Tatauranga Aotearoa Statistics New Zealand	N	2013 usually resident population count. 4,353,198 (I) 2018 usually resident population count. 4,699,755 (I)	All in Aotearoa New Zealand on census night Five-yearly	2013 survey - field interviewer led 2018 survey - Self-administered (Stats NZ, 2021a)
<b>National ethnic population projections, characteristics, 2013(base)-2038 update. (Stats NZ, 2017b)</b>	Tatauranga Aotearoa Statistics New Zealand	N	2013 estimated resident population as at June 4,442,100 (I) 2018 estimated resident population as at June 4,900,600 (I)	Resident population as at 30 June of the reference year Five-yearly	Adjusted for known Census undercount, residents temporarily overseas and natural increase between Census and 30 June. (Stats NZ, 2020c)
<b>Time Use Survey (2009/10) (Statistics New Zealand, 2011)</b>	Tatauranga Aotearoa Statistics New Zealand	N	9159 (I)	Primary sampling unit design No update	Diary and personal questionnaire; face-to-face computer-assisted interviewing by trained interviewers; self-administered questionnaires; 12 years and over. (P)

<b>Dataset name and year</b>	<b>Data source</b>	<b>Focus</b> N=National R=Regional	<b>Sample size (n)</b> I=Individual H=Household O=Organisation	<b>Representativeness Update frequency</b>	<b>Data limitations</b> P=pre-COVID-19 M=mid-COVID-19
<b>New Zealand General Social Survey (2016 and 2018) (Stats NZ, 2017e, 2018a)</b>	Tatauranga Aotearoa Statistics New Zealand	N	Approx. 12,000 (H)	Usually resident Aotearoa New Zealand population aged 15 years and over, in private dwellings in the North and South islands and Waiheke Island. (Stats NZ, 2018a) Two-yearly	2016 survey - Potential seasonal variation April–Nov 2016, Jan–April 2017 survey periods due to the Kaikōura earthquake. (P)
<b>Te Kupenga (2018) (Stats NZ, 2020d)</b>	Tautauranga Aotearoa Stats NZ	N	Approx. 8500 (I)	Post-censal survey of those identifying as Māori in 2018 census Five-yearly	A lower proportion of Māori completed the 2018 Census, which resulted in some bias; most bias effects removed through statistical weighting. (P)
<b>Survey of New Zealanders (2016 and 2019) (Department of Conservation, 2016, 2019e)</b>	Department of Conservation	N	2016 survey - 4131 (I) 2019 survey - 2803 (I)	Random selection from Electoral Roll. Weighted adjusted sampling based on regional council population distribution. Annual	2016 survey - Online and paper-based self-completion; potential seasonal variation March-May survey period; 18 years and over. (P) 2019 survey – Self-completed, opt-in panels; potential seasonal variation May-June survey period; 18 years and over. (P)

<b>Dataset name and year</b>	<b>Data source</b>	<b>Focus</b> N=National R=Regional	<b>Sample size (n)</b> I=Individual H=Household O=Organisation	<b>Representativeness Update frequency</b>	<b>Data limitations</b> P=pre-COVID-19 M=mid-COVID-19
<b>State of Volunteering 2020 (2020)</b> <b>(Volunteering New Zealand, 2020)</b>	Volunteering New Zealand	N	More than 3000 (I and O)	Online survey sent to volunteering-involving organisations and volunteers Annual	Online survey; potential seasonal variation, survey period mid-Dec 2019-end Feb 2020. (P), (M)
<b>Quality of Life Survey (2016 and 2018)</b> <b>(Waikato component)</b> <b>(Waikato Regional Council, 2017, 2019b, 2019c)</b>	Waikato Regional Council	R	2016 survey - 1280 (I) 2018 survey - 1416 (I)	Weighted adjusted sampling based on regional and city council population distribution and population size by gender, ethnicity, and ward/local board. Two-yearly	2016 survey - Potential seasonal variation, March-June survey period; 18 years and over. (P) 2018 survey - Potential seasonal variation April-June 2018 survey period; 18 years and over. (P)
<b>Your Environment - What Matters? (2019)</b> <b>(Waikato Regional Council, 2019c)</b>	Waikato Regional Council	R	1250 (I)	Electoral roll (n=959); online survey (paid social media ads, third-party panel) (n=217); intercept interviewing hard copy surveys at retail outlets and supermarkets (n=48); telephone interviewing (n=26) Annual	Potential seasonal variation March-April survey period; Reduced landline ownership made robust sampling using Computer Assisted Telephone Interviewing difficult, hence various data collection methods; 18 years and over. (P)

### 3.3.2 Database Limitations

The aggregated datasets I used in this chapter provide a snapshot in time. While many of these projections are updated regularly (Table 3), this research is limited by using backwards-looking data to predict future age-related behaviour. Such data may not, for example, reflect the impact that non-demographic factors, including pandemics or natural disasters and significant government or business decisions related to such incidents, might have on data projections. It is also important to note that between 2013 and 2018, some data sources changed; for example, the Time Use Survey 2009/10 was used in 2013, while the General Social Survey (GSS) 2016 supplied the 2018 data (Stats NZ, 2018b). Changes in DOC survey methodology between 2016 and 2019 also make direct comparisons between those years inadvisable (Department of Conservation, 2019e).

## 3.4 Results

### 3.4.1 Age or Stage?

Aotearoa New Zealand's CLC groups and their volunteer members are active across the country (Nature Space, n.d.). However, while Aotearoa New Zealand has a good understanding of current CLC (Heimann, 2019; Peters et al., 2015), future CLC is less well understood. Most present-day active conservation volunteers are 50 years old and over (Peters et al., 2015). By 2050, those volunteers still alive will be potentially less active as 'hands-on' predator controllers, cutting traplines, setting and maintaining traps and bait stations, and laying bait. Increasing age will affect their future volunteer capacity regardless of whether younger volunteers engage in practical biodiversity restoration. Consequently, negative impacts on future predator control, and the PF2050 biodiversity restoration vision, can be anticipated.

The PF2050 strategy anticipates these life course concerns stating that "our society is changing – we are ageing, becoming more urbanised and more culturally diverse". This strategy acknowledges that PF2050 must be sufficiently socially flexible to accommodate these shifts (Department of Conservation, 2020f, p. 33). Practical solutions are needed to determine who, other than those currently carrying out predator control, will maintain, extend, and potentially deliver a predator-free Aotearoa New Zealand. This chapter builds on future volunteering capacity concerns, framed by Norton et al. (2016) as the need for "investment in the next generations of restoration practitioners".

Volunteering appears to be a relatively stable behaviour over the life of an individual, where "...the majority of those who were volunteering at the beginning did not stop, and most of those who did not volunteer initially did not start later" (Lancee & Radl, 2014, p. 833; Niebuur

et al., 2018). As Volunteering New Zealand (2020) survey results indicate, 82.3% of volunteers have a long-term commitment to their current volunteering role; once Aotearoa New Zealand volunteers have committed to that activity, they are likely to continue, irrespective of age.

### 3.4.2 Conservation Attitudes and Volunteer Motivations

Understanding volunteer attitudes towards and motivations for the environment may suggest ways of encouraging more people to volunteer (Ganzevoort & Van Den Born, 2020; Guiney, 2009; Kragh, 2017). Aotearoa New Zealanders hold predominantly positive attitudes towards the environment, rating natural scenery and the environment 9.1 out of 10, equalling attitudes towards freedom, rights and peace (Stats NZ, 2018c). These findings are supported, in general, by the upward trend in personal importance of conservation reported nationally, from 68% to 76% between 2007 and 2019 (Department of Conservation, 2016, 2019e). More than 80% of Aotearoa New Zealanders felt nature improved their lives personally, irrespective of where they lived (rural, 88%; provincial town dwellers, 81%) (Department of Conservation, 2016). Meanwhile, regional Aotearoa New Zealanders' pro-ecological attitudes, based on the New Ecological Paradigm Scale (Anderson, 2012), have remained high and relatively stable between 90% (2000) and 87% (2019) (Waikato Regional Council, 2020).

However, volunteer motivation differs with culture, age, retirement, and health status (Grönlund et al., 2011; Komp et al., 2012; Sloane & Pröbstl-Haider, 2019). People volunteer for many reasons: connecting with and helping the community, social contact, accessing novel nature-based experiences, leaving a legacy, and altruism. Other motivations include developing skills, gaining access to career opportunities and learning experiences, and gaining others' admiration (Caissie & Halpenny, 2003; Sloane & Pröbstl-Haider, 2019; Volunteering New Zealand, 2020). Further motivations among Aotearoa New Zealand conservation volunteers include having a volunteer role identity (Heimann, 2019), feeling connected to nature, and having a sense of community (Ough Dealy et al., Under review).

Motivations supportive of conservation do not necessarily express themselves as actions for the environment (Kollmuss & Agyeman, 2002). Between 2013 and 2016, about 44% of national respondents were not active in conservation (Department of Conservation, 2016); by 2019, the inactivity level had increased to 60% (Department of Conservation, 2019e). In terms of 'hands-on' biodiversity restoration activities, particularly predator control, in 2016, only 1 in 4 national survey participants were active (Department of Conservation, 2016). By 2019, the percentage of those controlling predators (not including mice in the home) had fallen to 14% (Department of Conservation, 2019e). Regional data for 1998 and 2019 supports the national picture, with

only 4% to 6% of all age groups actively involved in predator control (Waikato Regional Council, 2019a).

The challenge for PF2050 is two-fold: to encourage potential volunteers to channel their concern for the environment into activities supportive of a predator-free Aotearoa New Zealand, and then sustain these actions long-term (Department of Conservation, 2016). While current conservation volunteers somewhat or strongly agree with the concept of predator control (92.2%), they are less confident (54.3%) that PF2050 goals will be achieved (Heimann, 2019). Research by Dickie (2018) is more encouraging, indicating that young adults, while not directly engaged in predator control, express strong interest (79.8%) in the PF2050 goal.

### 3.4.3 New Zealand's Changing Population

#### 3.4.3.1 Ageing

Aotearoa New Zealand's population is ageing. By 2053, 25% of Aotearoa New Zealand's population is projected to be 65 years or older (Stats NZ, 2020a). Aotearoa New Zealand's median age is also likely to trend upward, from 37 years in 2018 to 44 years in 2048 (Stats NZ, 2021b). Aotearoa New Zealand's ageing population and rising median age might imply a secure future for CLC as current Aotearoa New Zealand conservation volunteers tend to be older (Peters et al., 2015). However, the Commission for Financial Capability has recommended that the current (2021) Aotearoa New Zealand Superannuation (pension) age of 65 years continues through to mid-century due to "increasing numbers of New Zealanders who are vulnerable to poorer outcomes in their future retirement" (Commission for Financial Capability, 2020, p. 4). This recommendation aligns with the projected 15-29% rise (by 2068) of those working beyond the pension age (Stats NZ, 2017d). However, older, disability-free individuals, who may be financially available and willing to volunteer, cannot be considered a homogenous group. Some may transition from full-time to part-time work to retirement (Boyd & Dixon, 2009; Choi, 2003) or exercise episodic task-specific activity (Brayley et al., 2014). In short, an extended working life may negatively affect volunteer availability and, consequently, the volunteering choices they can make (Chambré & Netting, 2018).

Aotearoa New Zealand age-related conservation action data is minimal (Table 4), thus potentially affecting interpretation. Despite this limitation, the data reveal patterns, for example, ageing influencing the likelihood of volunteering, thus suggesting that conservation action modes may differ throughout the human life course (Table 4).

**Table 4***Physical and Non-physical Conservation Actions in the Previous 12 months by Age Group.**(Department of Conservation, 2016) N=4073.*

Conservation activity	18-24 years	35-49 years	65+ years
<i>Non-physical</i>			
Expressed opinion online	24%*	17%	7%*
Encouraged others to contribute to conservation activity, group, or issue	23%*	14%	12%*
Sought conservation information	23%*	18%	15%*
<i>Physical</i>			
Predator/weed control, hunting, setting traps	1%	1%	0%
Tree/native planting	0%	0%	1%
Nothing	42%	46%	49%*

Note. \* =  $p > .05$ 

Expressing conservation actions through non-physical means, including online views, encouraging others to participate in conservation activities, and proactively seeking conservation information declined with age (Department of Conservation, 2016) (Table 4). This trend is unrelated to physical actions directly impacting the environment, such as predator control (Table 4). Volunteers of different ages may spend similar amounts of time in conservation activities (predator/weed control and tree planting) yet express their actions differently. Older volunteers tend to carry out regular localised hands-on behaviours. In contrast, younger volunteers concentrate more on ‘virtual’ activities, sharing conservation-related information, opinions, and petitions online and supporting larger-scale actions through worldwide climate change protest marches (Achieve, 2018; O'Brien et al., 2018; Turns, 2020).

#### 3.4.3.2 Diversity

Aotearoa New Zealand’s population diversity and associated age profiles are also changing. Between 2013 and 2038, projected European (Pākehā) Aotearoa New Zealander numbers will likely increase more slowly than other ethnicities (3,312,000 to 3,781,000). Over the same period, Māori population projections increase from 692,000 to 1,059,000. Pasifika populations, including Samoan, Tongan, and Fijian, will also potentially increase from 344,000 to 590,000 (Statistics New Zealand, 2015b). Asian populations, including Chinese, Indian and Korean, are likely to more than double from 541,000 to 1,272,000 (Statistics New Zealand, 2015a). Thus, by 2038, those in Aotearoa New Zealand, identifying as Asian, are projected to outnumber Māori by 213,000. Regional projections are that ethnic diversity will increase faster in less-diverse regions (Cameron & Poot, 2019). I acknowledge that interactions between migrant and

Aotearoa New Zealand-born populations and trends exhibited by multi-ethnic populations, including age-sex profiles, interethnic partnering, and different fertility patterns, also exist. However, commenting on such complexity concerning CLC volunteering is beyond the scope of this chapter.

As ethnicity population numbers change, so too do their age profiles. Aotearoa New Zealand's current age profile reflects an older European (Pākehā) and more youthful Māori, Pasifika, and Chinese populations. By 2038, the country's projected population will likely have increasing proportions of younger Māori, Pasifika, and Chinese (as well as groups of other Asian ethnicities) (Stats NZ, 2017b). Currently, the DOC Community Fund (Department of Conservation, n.d.-b) supports Māori-led hapu/iwi and takiwa (district) conservation initiatives, as well as funding the Chinese Conservation Education Trust (Chinese Conservation Education Trust, n.d.). However, Aotearoa New Zealand's anticipated ethnic population and age-related changes provide CLC groups with volunteer recruitment and retention opportunities from an ethnically more diverse population (Stats NZ, 2017c). These population-related changes may negatively impact future CLC group sustainability if these groups fail to anticipate, adapt to, or accommodate.

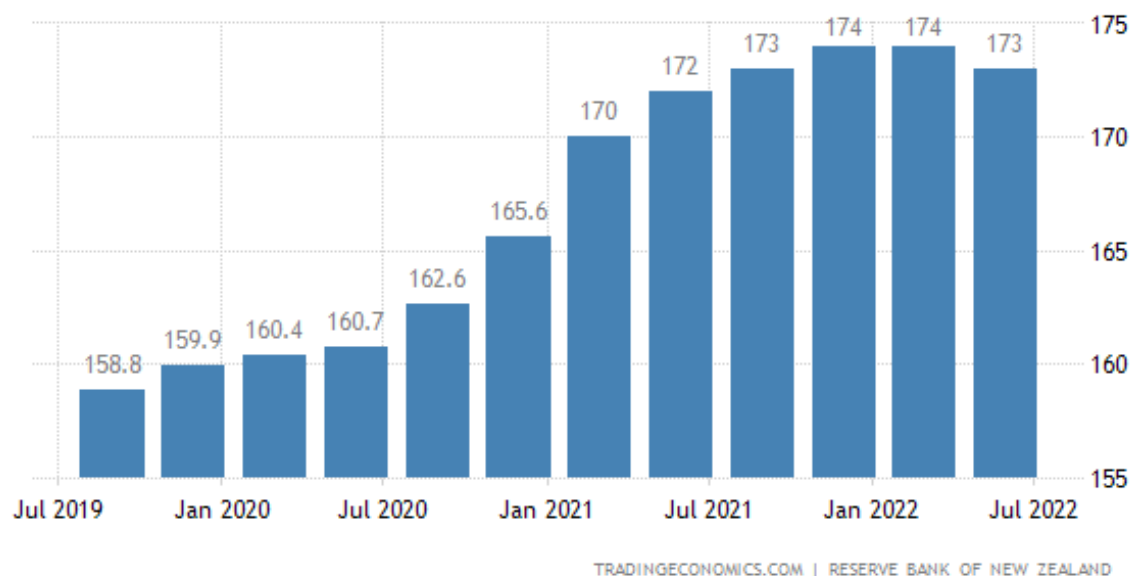
#### 3.4.4.3 Limiting Factors, Time and Financial

Volunteers may provide their time and labour for free, but other factors may limit effective involvement. For example, the most significant time constraints on volunteering are competing vocational, social, educational, and caring commitments (Volunteering New Zealand, 2020). Volunteering can also be limited by and incur personal costs, including transport, training, and personal protective equipment. Internationally, these financial costs have hindered active conservation participation (Hansen & Slagsvold, 2020; Higgins & Shackleton, 2015; Hobbs & White, 2012).

While limited in period and not including the as-yet-unknown economic impacts of COVID-19 or natural disasters such as Cyclone Gabrielle, on household debt status, the upward trend in Aotearoa New Zealand's actual and projected household debt to income between 1991 and 2022 (Figure 5) suggests reduced financial capacity that may have a negative impact on individual volunteering.

**Figure 5**

*Aotearoa New Zealand Households Percentage of Actual Debt to Income July 1991 to July 2022 (Trading Economics, 2023).*



Community conservation could also benefit by understanding and addressing the barriers to volunteering experienced by the *precariat*, a currently under-engaged group. In 2017, one in six Aotearoa New Zealanders was part of this group, experiencing persistently insecure employment or income (Dictionary.com, 2021; Groot et al., 2017; McCarthy, 2015). In 2018, 21% of Aotearoa New Zealanders were in part-time, although not necessarily insecure, work (Rosenberg, 2018). Evidence shows that labour precarity can lead to volunteering opportunities (Sandiford & Green, 2020). However, it is unclear whether precariat members can sustain those volunteer efforts as they may also experience ‘precarity of place’ (Banki, 2013; Bates et al., 2020). Frequent location changes due to uncertain labour and accommodation opportunities may reduce commitment to long-term place-based volunteer projects. The corollary for place-based voluntary community conservation groups may be a reluctance to invest time, effort and training in those unable to settle in a community long enough to form stable volunteering relationships (Standing, 2011). As Thompson (1993, p. 160) comments about firefighting volunteers, “Recent arrivals and individuals who intend to move away soon are not a fertile group to cultivate for new members, since they generally are not willing to make the substantial commitment required for this activity”.

CLC might learn from successful precariat group exceptions such as student peer group volunteering (Student Volunteer Army, n.d.), expatriates experiencing shorter-term in-country placements (Smith, 2009), and physically distanced volunteering continuing during COVID-19 lockdown (Biddle & Gray, 2020; Tierney & Mahtani, 2020).

However, the potential impact of current events, such as COVID-19, on future CLC volunteer availability is unknown. Recent Australian research (Biddle & Gray, 2020) suggests that, at least in the short term (February and April 2020), 65.9% of volunteers stopped volunteering. Those over 65 years, the most virus-vulnerable group, were more likely to cease volunteering than other age groups. Aotearoa New Zealand's CLC groups and their future efforts may be similarly affected.

#### 3.4.4.4 Access to Conservation Projects

By 2050, the United Nations Department of Economic and Social Affairs Population Division (2014) projects that 66% of the world's population will live in cities. Aotearoa New Zealand is ahead of this world trend, with more than 85% of its population currently living in urban areas (Central Intelligence Agency, n.d.; Leeson, 2018; Stats NZ, 2017a). Between 2009 and 2019, this urban dweller percentage has been relatively stable (O'Neill, 2021a). However, by 2048, about half of Aotearoa New Zealand's population growth will likely be Auckland-based (Stats NZ, 2021b), potentially providing urban-based conservation opportunities in this specific part of the country.

Current urban/rural CLC location data are limited. Of the 288 groups responding to the Peters et al. (2015) survey, 54% self-identified as rural; 18% as urban. More recent data from Nature Space, a website for groups, individuals and landowners undertaking ecological restoration in New Zealand, describes 14% of its groups, their administration, membership, and activities as based in urban areas (Nature Space, n.d.). Of those who volunteer for the environment, rural residents (30%) are more than twice as environmentally active as urban dwellers (13%) (Waikato Regional Council, 2019c).

Volunteers appear more likely to volunteer for places they live near to and identify with (Deri-Armstrong et al., 2016). Willingness to volunteer thus appears to be affected by the distance volunteers travel to a conservation project. The greater the distance potential volunteers live from voluntary conservation opportunities, the fewer people will volunteer (Seymour & Haklay, 2017). The Predator Free New Zealand Trust community group location map (Figure 6) visually represents the national distribution of predator-free volunteers (Gooch, 2003; Predator Free New Zealand, n.d.).

**Figure 6**

*National Map of Predator Free New Zealand Community Predator Control. Map by permission Predator Free New Zealand (n.d.).*



Transportation availability and costs can also impact conservation volunteering outputs. Easier access to volunteering opportunities, for example, increases the decision to volunteer and the amount of time devoted to volunteering (Deri-Armstrong et al., 2016). Access to public transport differs between urban and rural dwellers. Fewer city dwellers (6.3%) found public transport difficult or very difficult to use than those living in rural areas (75.2%) (Stats NZ, 2019). Difficulty accessing public transport data implies that rural CLC volunteers depend more on access to private vehicles. Thus, the fixed and flexible running costs of owning a vehicle may further impede active rural conservation engagement (Automobile Association, 2018).

Aotearoa New Zealand's rural population is also projected to age and reduce in number (Table 5). Consequently, the conservation action capacity of rural community-led conservation groups, 86% of Aotearoa New Zealand's CLC volunteers (Nature Space, n.d.) servicing the majority of Aotearoa New Zealand's landmass, will be detrimentally impacted. The consequences of a reducing and ageing rural population will likely be fewer active predator control volunteers. Associated negative impacts may include extended periods between biodiversity protective activities due to non-CLC competing commitments. Prioritizing easier-to-access CLC projects, perhaps closer to rural population centres and, should funds and expertise availability allow, increased reliance on specialist conservation contractor services (e.g., IAS control) may result.

**Table 5**

Percentage of Aotearoa New Zealand National, Auckland, Southland, and Northland Regional Populations by Age Cohort 2018 (base) to 2048 (projection)

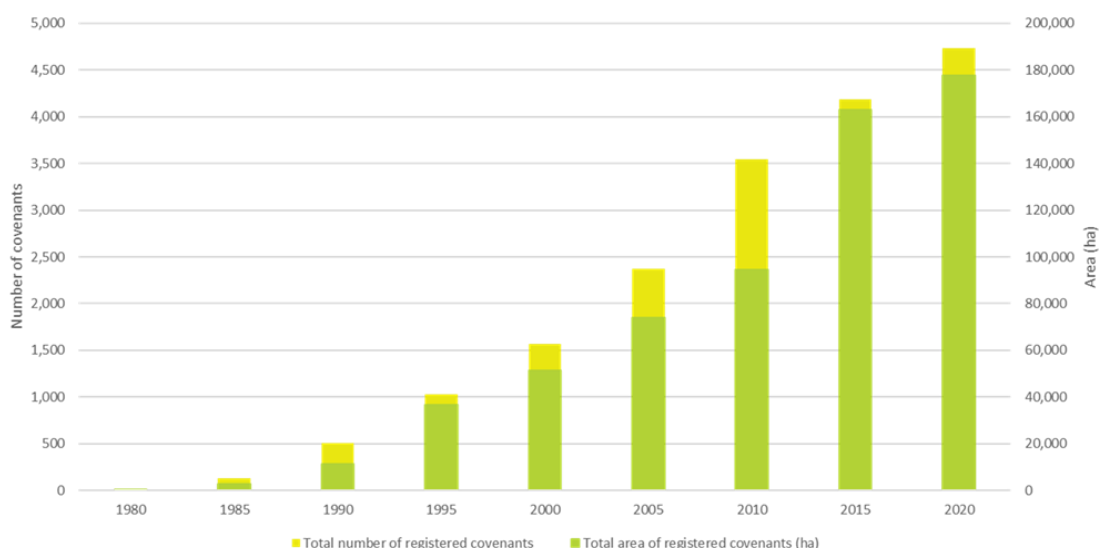
	Age cohort											
	15-39				40-64				65+			
	National	Auckland	Southland	Northland	National	Auckland	Southland	Northland	National	Auckland	Southland	Northland
2018 (base year)	34	38	31	27	32	30	33	33	15	12	17	19
2048 (projected year)	30	33	27	25	32	33	31	30	23	19	27	29

(Stats NZ, 2021b).

Aotearoa New Zealand’s urban population is increasing, as is rural hectareage under QEII National Trust covenants (Figure 7). Between 1980 and 2019, this upward trend suggests an increasing citizen commitment to conservation on privately owned and Crown leasehold property (Queen Elizabeth II National Trust, 2019).

**Figure 7**

*Total Area and Number of QEII National Trust Registered Covenants, 1980-2020 (Permission to reproduce table granted by QE II National Trust, 2019)*



### 3.4.4 Adapting CLC Approaches

A range of barriers to conservation action currently experienced by individuals (e.g., access, income, time) are likely to influence involvement with CLC groups in the near future. Other inadvertent barriers from CLC groups, including group social structure and professionalisation, exist.

#### 3.4.4.1 CLC Group Profiles

Nearly 80% of Aotearoa New Zealand community conservation groups surveyed in 2015 had been operating for six or more years (Peters et al., 2015). Some current community conservation projects have had decades of time and effort invested, for example, Waimate North Landcare Trust (WNL), 14 years; Russell Landcare Trust (RLT), 20 years; and Supporters of Tiritiri Matangi (SoTM), 34 years (Russell Landcare Trust, n.d.; Supporters of Tiritiri Matangi Inc, 2010; Waimate North Landcare Trust, n.d.). Anecdotal reporting confirms that RLT and WNL founding members are still active. Current CLC appears to attract and sustain long-term volunteering rather than irregular volunteer activity. More general volunteering data supports this view, with 82.3% of Volunteering New Zealand survey (2020) respondents intending to

continue their current volunteering role long term. Such commitment, however, may contribute to exclusive ‘in’ groups (Masson & Fritsche, 2014; White et al., 2011). Unless CLC groups specifically attract younger volunteers (Winch et al., 2020), they may risk group extinction and the loss of past and current biodiversity restoration achievements (Klein, 2017).

#### 3.4.4.2 CLC Group Professionalisation

To survive, some Aotearoa New Zealand community conservation groups are already adapting to their ageing volunteer base and decreasing their appetite for physical conservation action by adopting a more professional operating model (Table 6). This approach maintains group conservation efforts and achievements and ensures the sustainability of ongoing group and ecological restoration.

**Table 6**

*Examples of Northland Aotearoa New Zealand Community-led Conservation Group Approaches*

Community group	Group type	Contract positions	Success
Kiwi Coast Trust	Umbrella group helping individual CLC groups.	Administrative and technical assistance for Northland conservation groups based in Whangarei, Mid North, and Far North Aotearoa New Zealand.	Increase in projects and groups contributing predator control data from 31 (2013) to 115 (2018) (Kiwi Coast Trust, 2018).
Mahinepua Radar Hill Landcare Trust	Individual community group carrying out kiwi protection through predator control.	Predator controller	Significant recovery of pōhutukawa trees from foliage browsing by possums (Figure 8).
Russell Landcare Trust	Individual community group carrying out kiwi protection through predator control.	Project manager, predator controller, treasurer	Intensive rat control over 220 ha (Harwood, 2019; Russell Kiwi Protection, 2019)

Northland groups, Russell Landcare Trust (RLT), Mahinepua Radar-Hill Landcare Trust (MRHLT), and Kiwi Coast Trust (KCT), for example, have moved from being predominantly volunteer-based to contactor-based operations. RLT and KCT have contract project managers, while RLT and MRHLT also employ predator control specialists. KCT has employed predator control advisors, funded by the Northern Regional Council targeted predator management rate (14c/\$1) (Northern Regional Council, 2021).

Increased CLC professionalisation may benefit current and future community conservation and PF2050 aspirations. Requirements for up-to-date methods and technology utilised consistently by professionals in a planned manner may maintain current predator control achievements and support future national predator-free aspirations. For example, professional possum control on the Mahinepua Peninsula has improved Pōhutukawa (*Metrosideros excelsa*) foliage (Figure 8).

### Figure 8

*The impact of Mahinepua Radar Hill Landcare Trust Contractor Common Brushtail Possum (Trichosurus vulpecula) Control on Pōhutukawa (Metrosideros excelsa) Foliage on the Mahinepua Peninsula, Northland, New Zealand. Photo credit: Mahinepua Radar Hill Landcare Trust.*



Pre-2005

Post-2008

Professionalisation may also assist in overcoming barriers to volunteering, including time, location and income reflected in projected decreasing volunteer numbers. Professionals, for example, may free up volunteer efforts to concentrate on one-off activities such as group restoration plantings or species translocation events. However, the impacts of increasing professionalism on future conservation volunteer group membership and group structure are uncertain.

## 3.5 Discussion

Human populations are dynamic, and their demographics change over time. CLC, dependent on human involvement, is likewise impacted. Consequently, CLC groups and national predator control visions, such as Predator Free 2050, benefit from identifying, anticipating, adapting to,

and understanding population projections to meet their particular current goals and future aims.

Here I discuss barriers to CLC, particularly predator control volunteering, population demographics and their impacts on CLC, including population diversity and diversification. I then summarise practical mechanisms for addressing the impacts of projected population change on CLC sustainability.

### 3.5.1 Overcoming Barriers to Predator Control Volunteering

CLC could benefit from identifying and addressing barriers preventing volunteering, including time constraints, competing vocational, social, educational, and caring commitments, impact on future commitments, disinterest, or undervalued competencies (Hansen & Slagsvold, 2020; Heimann, 2019; Volunteering New Zealand, 2020). CLC projects may need to adapt by providing more self-interested and flexible forms of involvement (Hansen & Slagsvold, 2020).

Within the context of conservation actions contributing to systemic change (Singh, 2020), virtual volunteering presents PF2050 with both a challenge and an opportunity. While realising PF2050 aspirations necessitates converting individual conservation concerns into actions that further existing local community predator control efforts, the effectiveness of the following approaches needs to be independently assessed. CLC groups could develop younger volunteer engagement in a stepwise fashion by identifying and then building on their areas of interest (Winch et al., 2020). For example, young volunteers might lead online predator control workshop communications and share these skills with older volunteers, who in turn may provide hands-on predator control mentoring to younger and non-volunteers. Such cross-age mentoring may also support pro-social behaviour development (Deane et al., 2018; Raposa et al., 2017).

Currently, only 32.6% of volunteering organisations reimburse volunteers for out-of-pocket expenses (Volunteering New Zealand, 2020). National and regional government agencies may need to subsidise volunteer expenses, including travel times to the volunteering site, PPE and specialised weed and predator control training and equipment. CLC groups, particularly in rural areas, may consider subsidising private transportation or providing group transport to conservation sites.

CLC groups and volunteers could benefit from better awareness of and access to expense reimbursement and honoraria payment exemption provisions (Inland Revenue, 2021).

Currently, volunteer labour in Aotearoa New Zealand is not tax-deductible, while charitable donations are. Toran (2014) states that tax incentives can encourage volunteer labour supply.

Changes to Aotearoa New Zealand's taxation policy could incentivise current and future volunteers.

### 3.5.2 Utilising Interest in Predator Control Volunteering

Given the low levels of current CLC predator control, PF2050 may need to capitalise on non-physical actions supporting its aims, including fundraising (23%); acquiring conservation information (19%); raising awareness and promoting activities about conservation issues (17%) and expressing a conservation-related opinion through online forums (17%) (Department of Conservation, 2019e). Another approach may be considering the preferential interest displayed in restoration (planting) over protection (weed or predator control), which may suggest a CLC effort hierarchy (Conservation Volunteers, n.d.-b; Seek Volunteer, 2021). A snapshot of volunteer opportunities advertised by Seek Volunteer (2021) showed that planting attracted 19 adverts; weeding, 16; and predator control, 4. Future research may identify planting as a social, annual, life-creating, immediate, visible, and emotionally engaging activity. In contrast, predator control may be a conceptually challenging activity necessitating visualising the indirect effects of control at an ecosystem scale. Predator control is generally a solitary task, dealing with death. Effective long-term predator control is repetitive and entails updating relevant skills associated with changing predator control technology. Predator control results are subtle and incremental, often difficult to recognise without recording techniques such as photo plots (Handford, 2002). Success, measured in diminishing predator numbers, may prove demotivating. Research is needed to identify the underlying rationales for preferring one conservation activity (e.g., planting) over another (e.g., predator control).

### 3.5.3 Predator Control Volunteering Over the Lifespan

Dávila and Díaz-Morales (2009, p. 92) suggest volunteering "...can be an activity that ...satisfy[ies] very different motives over the life course", thus potentially engaging non-volunteers later in life. Life course volunteering motivations could help shape multi-staged long-term biodiversity restoration and conservation projects (Leyshon et al., 2021; New Zealand Plant Conservation Network, 2014). Other opportunities could include specific one-off 'taster' conservation actions providing hands-on experience to current and intending volunteers (Leyshon et al., 2021). In contrast, CLC-tertiary educational institution partnerships may enable students and volunteer groups to build ongoing conservation-based connections.

### 3.5.4 Population Diversity and Diversification

It is unknown how projected national diversity changes will impact CLC volunteering. However, increasing conservation action by accessing population diversity is an opportunity CLC and

PF2050 should not dismiss. Conservation funding for a broader range of ethnic groups, for example, may be warranted.

Future CLC opportunities must recognise and acknowledge the broader, more diverse population's varied interests, capabilities, and availability. Widening the definition and lived experience of volunteering may benefit volunteering efforts, as understood by other ethnicities resident in Aotearoa New Zealand (Norton et al., 2016; Volunteering New Zealand, 2020). Joint CLC volunteering projects, led, and designed from positions of autonomy and self-determination, may emerge from this more informed view. Identifying actions that appeal to particular communities and deliberately harnessing those actions may further increase conservation action. Existing CLC groups will benefit by creating spaces within their structures that enable more and different people to become involved, thus further increasing conservation action outcomes (Gould et al., 2018; Norton et al., 2016). Deliberate establishment of collaborative multi-agency inter-organisation projects, particularly in ethnically diverse urban areas, may involve a broader range of potential volunteers (Auckland Council, 2020) and provide a more sustainable, flexible approach to future population diversity.

Currently, the DOC Community Fund (Department of Conservation, n.d.-g) supports Māori-led hapū/iwi and takiwā (district) conservation initiatives, as well as funding the Chinese Conservation Education Trust (Chinese Conservation Education Trust, n.d.).

It is essential to acknowledge that these multi-ethnic opportunities would parallel existing Māori (iwi, hapū, whānau)-led conservation efforts aligned to their local social, cultural, and environmental priorities, goals, and worldviews. So too, is the need for European (Pākehā) and tau iwi (non-European/non-Pākehā) New Zealanders to design or co-design conservation action programmes relevant to their own needs and perspectives (Department of Conservation, n.d.-f). As Norton et al. (2016, p. 178) state, “Māori are critical to the restoration vision for 2050 with partnerships, policy and legislation that recognise an iwi’s mana, values and mana motu-hake (self-determination) in relation to the environment becoming fundamental elements.”

Changes in rural populations will also increase pressure on rural community conservation groups as their source populations age and reduce in number. Partnering urban with rural groups may benefit both parties, resulting “in thousands of small projects that will together merge eradication and control concepts on [a] landscape scale” (Russell et al., 2015). Urban CLC groups may, in turn, provide some of the ‘hands-on’ assistance that the mainly rural QEII Trust covenanted properties need. The Sister City movement may provide a helpful model (Sister Cities International, 2020).

### 3.5.5 Education for CLC Sustainability

Continued project-building between school-based environmental education and community-led conservation is needed to enable today's students to become tomorrow's active conservation volunteers (Department of Conservation, 2020f; Dove, 2019).

CLC must be further developed as a recognised and valued part of Aotearoa New Zealand's Education for Sustainability Curriculum (Ministry of Education, 2020). Supporting mechanisms could include secondary school and tertiary education credits for active volunteering with community conservation groups and tertiary student interns working alongside CLC groups (Enviroschools, n.d.; Papa Taio Earthcare, n.d.). Enviroschools can continue encouraging links between global Friday for Future school strike activism (Wahlström et al., 2019) and local hands-on community conservation actions (Dove, 2019), thus developing practical means of ameliorating the ecological grief associated with climate change loss (Cunsolo & Ellis, 2018).

### 3.5.6 CLC Group Professionalisation

Some CLC groups are already embarking on pathways to professionalisation. Supportive actions by regional and national government might include funding for, or access to, executive member training, reimbursement, and recognition. Such professionalisation may simultaneously develop career pathways that increase work opportunities and conservation outcomes (Heimann, 2019). However, there may be issues associated with group professionalisation that will need addressing. These include fewer opportunities for 'hands-on' volunteering, the potential for member disengagement, and employee/contractor costs demanding consistent, ongoing funding and associated administrative expertise and effort (Table 7).

**Table 7***Pros and Cons Associated with Proposed Aotearoa New Zealand Community-led Conservation Professionalisation Models.*

Community-led conservation professionalisation models	Pros	Cons	Mitigation
Agency-led (e.g., DOC, Regional Council)	Project independent of temporary nature of volunteering	Possible volunteer disempowerment	Involve communities in early decision-making and model development
	Appropriate financial, management, and communication skills	Dependent on agency prioritising community conservation	Community conservation outputs valued appropriately by agency
Paid positions in CLC groups	Enables skills retention	Uncertainty associated with ongoing funding to support positions	Establish funding opportunities specifically for paid positions
	Potential for shared roles across community groups	Fundraising needed to support position may reduce conservation capacity	
Independent government-funded consultancy	Maintain appropriate levels of professional skills	Possible volunteer disempowerment	Involve communities in early decision-making and model development
	Expertise and independent audit function	Reduce local engagement with project	Upskilling opportunities for local people

Successful succession planning may partly relate to adapting current CLC models through, for example, urban-rural collaboration and group professionalisation. I propose various professionalisation models; agency-led, CLC-paid positions, and independent consultancy (Table 7). Group professionalisation is a realistic approach, which among other CLC projects, can align with the 5-year PF2050 Action Plan statement, “Predator Free 2050 will only be achieved if everyone takes responsibility for it, requiring collaborative effort [regional and national] across the country.” (Department of Conservation, 2020b, p. 10).

In line with this collaborative approach, I propose funding CLC group professionalisation as central to any PF2050 investment discussions (Department of Conservation, 2020b, p. 14). Such investment would also benefit the broader restoration aims of CLC groups.

Professionalisation may also improve existing CLC group resilience by providing the time and

expertise necessary for specialist contract design and administration, health and safety legislation compliance, and sourcing insurance funding (Sakofsky & Cooney, 2017; Volunteering New Zealand, 2020).

### **Predator Free New Zealand community predator control**

The PF2050 vision has rallied new community predator-control groups (Fenwick, 2017; Predator Free New Zealand, 2017). However, their current status and anticipated trajectories are under-researched. Analysis of and extrapolation from relevant data may help to track and improve PF2050 group effectiveness, both current and future. While the longer-term impacts on volunteering are unknown, emerging from the uncertainty of recovery from COVID-19 restrictions and Cyclone Gabrielle's environmental impacts may boost Aotearoa New Zealand's outdoors-based CLC volunteering in the short term. Consequently, CLC groups may take advantage of this as the country returns to a more normal situation.

To be successful, CLC groups need to bring their communities with them (Department of Conservation, 2020b). Such changes should be long-term and developed in partnership with current and future conservation volunteers, thus ensuring their input and ownership (Table 7).

Furthermore, CLC resilience strategies could include alliance development by combining executive functions across NGOs (Bertacchini & Goberna, 2020), honoraria for officeholders, and funding agencies working with CLC groups to streamline funding applications and reporting requirements.

### **3.5.7 Benefitting from Others**

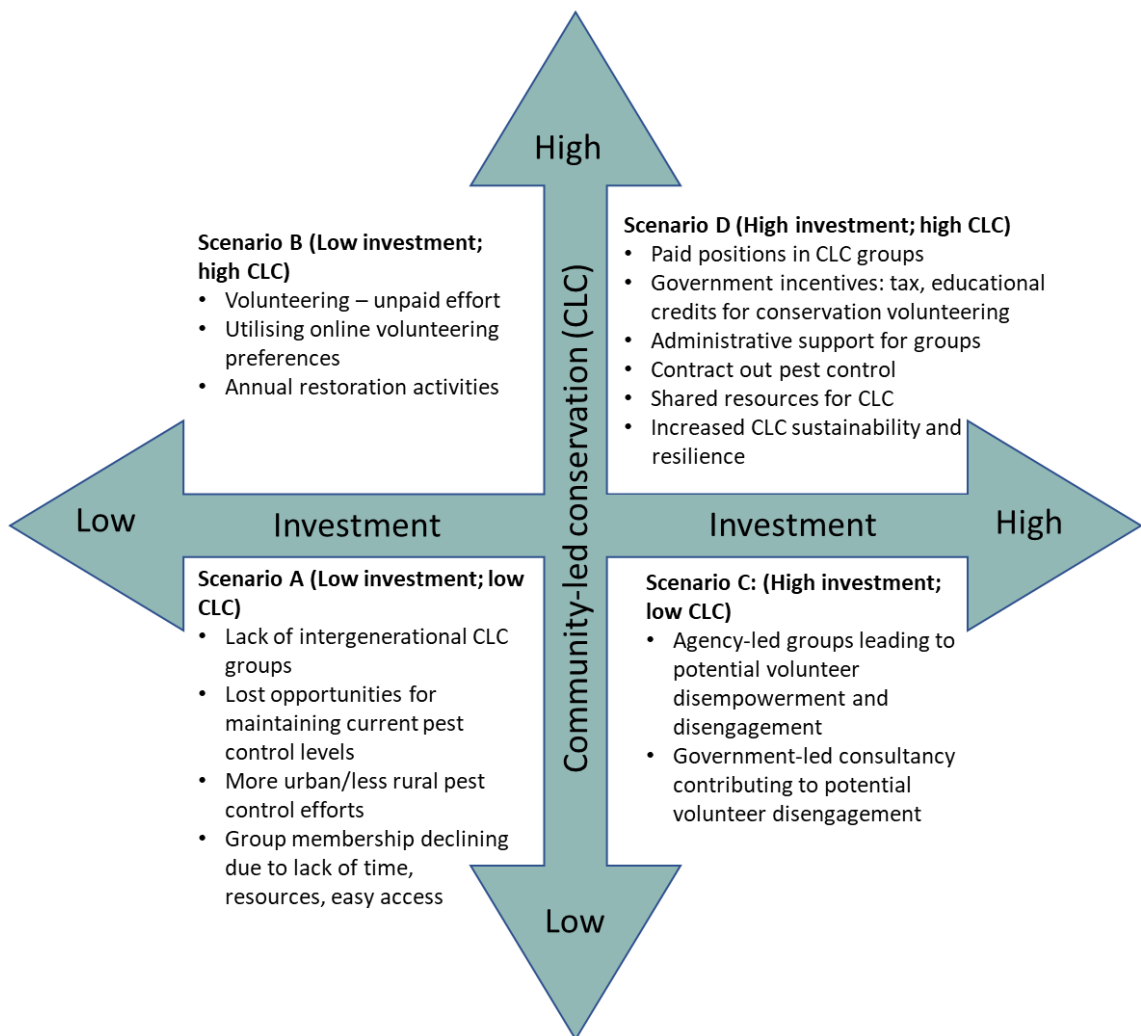
Many voluntary groups face similar volunteer shortages (Volunteering New Zealand, 2020). Non-CLC groups may find some of the group resilience strategies discussed in this chapter of interest. CLC groups could also benefit from considering non-CLC group resilience development measures. For example, the New Zealand Red Cross offers retail work experience leading to a nationally-recognised Certificate in Retail (New Zealand Red Cross, n.d.); the Fire and Emergency Services designate personnel as active champions and supporters of volunteers and volunteerism within the service (Fire and Emergency NZ, n.d.).

In order to survive, CLC groups cannot stay as they are. Current and projected demographic, economic and attitudinal data illustrating present-day and near-future societal trends and pressures suggest barriers to active community participation in conservation. However, understanding population change and applying demographic analysis to current and future community conservation may help CLC group resilience.

CLC group resilience may be promoted by moving from Scenarios A and C (Figure 9) to Scenarios B and D – two complementary scenarios necessitating different strategies. In Scenario B, volunteers continue working for free, possibly relying on non-financial inducements, including community recognition, to encourage volunteering. In Scenario D, paid positions, foreshadowed by Stats NZ (2020b), and tax and educational incentives could sustain volunteering efforts over time.

**Figure 9**

*Potential Impacts of Investment on Current and Future Aotearoa New Zealand Community-led Conservation.*



One of PF2050’s underlying assumptions is a resilient CLC that will move Aotearoa New Zealand’s vision of a predator-free nation by 2050 from wish to fulfilment. Achieving a predator-free Aotearoa New Zealand by 2050 and maintaining this state into an indefinite, possibly uncertain future necessitates an improved understanding and fostering of Aotearoa New Zealand volunteer motivation and associated CLC/PF2050 infrastructures. For Aotearoa New Zealand’s predator-free vision to succeed, government action, policy and practical tools

supporting current and future conservation volunteers must develop in parallel with predator control tools (Smith & Cordery, 2011).

### 3.5.8 Steps Towards Sustainable Community-led Conservation

A more comprehensive picture of future CLC can be gained by addressing several data limitations and research gaps. These include 1. addressing the under-reporting of emergent urban PF2050 and other CLC groups; 2. improving consistency in DOC survey methodology, which, in this chapter, made direct year-on-year comparisons inadvisable, and 3. developing a more nuanced environment volunteering definition (Stats NZ, 2018b) that categorises CLC volunteers separately; for example, from those volunteering for Greenpeace. However, despite these limitations, this research provides important insights into future CLC group sustainability, potential volunteer availability and the supporting role that government policy and investment could play. Practical ways of building CLC sustainability through an interest in and barriers to group professionalisation, population diversity, and predator control volunteering are described.

This chapter provides current and projected data illustrating present-day and near-future societal barriers to active community participation in Aotearoa New Zealand conservation. Understanding then addressing these barriers will support current and future community-led conservation resilience.

In summary, regional and national government policy should be proactive and support 1. tax incentives and expense allowances for current and future conservation volunteers; 2. infrastructural resources for existing community conservation groups, particularly in rural areas; 3. identification of and transition to future appropriately funded fit-for-purpose conservation group models; 4. environmental education development aligned with current and future community conservation needs; 5. opportunities for conservation education credits; 6. increasing the voluntary conservation sector level and variety of 'professionalisation', including funding paid positions; 7. longitudinal research identifying volunteer CLC motivations, enabling current and future conservation projects to be designed to embrace differing conservation volunteering preferences, attitudes, motivations and actions; and 8. 'showcasing' areas where successful conservation has led to outstanding outcomes with greatly enhanced Aotearoa New Zealand indigenous wildlife biodiversity increases.

### 3.6 Conclusion

In **Chapter 3**, I identified and described the current depauperate state of Aotearoa New Zealand biodiversity. PF2050, an attempt to redress this imbalance, relies partly on CLC efforts to achieve a predator-free Aotearoa New Zealand, by 2050. Furthermore, I utilised open-source aggregated data to identify actual and potential barriers to Aotearoa New Zealand CLC. Those barriers directly impact individual and group current conservation actions and future conservation intentions. Volunteer conservation actions were negatively impacted by volunteer ageing, time and financial resource availability, and access to restoration projects. Incorporating practical mechanisms, including CLC-supportive regional and national policies, other volunteer sector experiences, environmental education strategies, and early-adopter CLC group exemplars may partly address CLC sustainability concerns (Department of Conservation, 2020f; Peters et al., 2015). This chapter, therefore, establishes the context for developing policy and practice supporting the future sustainability of community-led conservation (**Chapters 4 to 6**) in this thesis.

In **Chapter 4**, I develop a qualitative tool to elicit conservation attitudes among Aotearoa New Zealanders. This tool will be tested on a wider sample of Aotearoa New Zealand adults in **Chapter 5**.

## Chapter 4 Aotearoa New Zealand Adult Conservation Attitudes

*World in the Present-day*



*Note.* By Enved001, 2019, collage, mixed media.

*World in the Future*



*Note.* By Enved001, 2019, collage, mixed media.

In this chapter, I will elicit Aotearoa New Zealand-specific conservation attitudes towards current conservation action and future conservation intention to achieve my second research objective:

*Objective 2: Identifying Aotearoa New Zealand attitudes towards current conservation action and future conservation intention*

To achieve this objective, I will apply two qualitative tools. First, the currently underutilised collage-elicitation interview technique followed by thematic analysis employing the list-creating *app*. Trello in a novel manner. This two-step approach will elicit Aotearoa New Zealand-specific conservation attitudes, an important motivator of CLC volunteering.

Chapter 4 begins with Aotearoa New Zealand residents of various ages from across the country creating collages based on their thoughts about their place in, and attitudes towards, the world of today and that of the future. In collage-elicited interviews, I then ask them how they might move from today's world to that of the future. The thematic analysis of collage interview participant responses using Trello identifies six main conservation attitudes. I then construct these six attitudes as Likert-like conservation attitude items. I will incorporate and report on these attitude items in Chapter 5, the quantitative phase of this research.

A version of Chapter 4 has been published as Ough Dealy, H.R., Jarvis, R.M., & Petterson, M. (2021). Innovative ways of illustrating the present, imagining the future and analysing themes: A collage-elicited interview study. *Methodological Innovation*, 14(3).

<https://doi.org/10.1177/205979912111051452>

## 4.1 Abstract

Mammalian predators are threatening Aotearoa New Zealand's endemic species with extinction. Community-led predator control may contribute to a predator-free nation by 2050. An individual's present and future thoughts about, and subsequent actions for, conservation rely on their current and projected motivations and concerns. In this chapter, I report innovative approaches to understand better how people feel about the present and future worlds and their place within these. A visual arts-based qualitative study approach incorporates conservation action theme elicitation and analysis. Twenty-five males and females from New Zealand's rural and urban communities, aged between 12 and 75 years, from primary, secondary and tertiary education, environmental education, and community conservation backgrounds, each created two collages of themselves situated in today's and a future world. Interviewer-led open-ended laddering questions elicited participant responses to their collages. A further open-ended question elicited actions participants would take to move

from their perceived present to a projected future world. Trello, a web-based list-making application, facilitated reflexive thematic analysis of the interview transcripts. Six common themes resulted: connectivity, commitment, learning cycle, practical actions, unconditional belief, and group action. These themes, presented as 8-point Likert-type scale items in a Qualtrics digital survey, contributed to the quantitative aspect of this mixed-methods study and may facilitate understanding of future Aotearoa New Zealand volunteer community conservation participation.

## 4.2 Introduction

Aotearoa New Zealand native biodiversity has a precarious present and an uncertain future. More than 4000 of Aotearoa New Zealand's critically endangered or naturally uncommon native species are threatened with extinction by introduced predators, climate change and habitat loss (Department of Conservation, 2019a; Parliamentary Commissioner for the Environment, 2017). In response, the Aotearoa New Zealand government established Predator Free New Zealand (PFNZ), a nationwide public and private partnership (Department of Conservation, 2019b) mandated to create a predator-free country by 2050.

PFNZ's implementation mechanisms include increasing support for community-led projects (Department of Conservation, 2017). The current community-led voluntary conservation (CLC) group model is assumed to support the PFNZ vision (Department of Conservation, 2017). However, it is unknown whether there will be the necessary public engagement by 2050 to support this vision. Currently, most active Aotearoa New Zealand community conservationists are at or beyond 65 years of age (Peters et al., 2015). This chapter builds on ways of addressing the future conservation volunteering capacity concerns raised by Peters et al. (2015).

An individual's personal beliefs about and attitudes towards the world and their place within it influence their engagement in community-led conservation (Thiermann & Sheate, 2020; Wray-Lake et al., 2010) and may shape their "...responses and willingness to alter (their future) behaviour." (Paterson et al., 2020, p. 1). My research took a pragmatic critical realist approach that "arises out of actions, situations and consequences..." (Cresswell & Cresswell, 2018, p. 10). In order to help understand the "rich and complex lives and opinions of the people we are researching." (Davies & Hughes, 2014, p. 26), I adopted a two-phase mixed-method methodology; the qualitative phase incorporating collage-elicited interviews and reflexive thematic analysis. These methods helped address Moon and Blackman (2014, p. 1168) cautionary

comment that “studying and understanding human-environment action needs to fully account for the subjective nature of human reasoning and choices.” The qualitative phase results underpinned the subsequent quantitative study phase. This approach is supported by triangulation, using more than one research technique to examine a research question, thus further verifying the research findings. “[It is an] attempt to map out, or explain more fully, the richness and complexity of human behaviour by studying it from more than one standpoint and, in so doing, by making use of both quantitative and qualitative data.” (Cohen et al., 2007, p. 141).

I intended to gather wide-ranging views about current conservation actions and future conservation intentions. Consequently, I accessed the voices of others through my primary, secondary and tertiary education, conservation, and public sector contacts, thus “enhancing the validity of the research outcomes.” (Richards & Munsters, 2010, p. 213). I identified collage-elicited interviews as the means of gathering such information.

In this chapter, I ascertain Aotearoa New Zealand conservation attitudes based on thematic analysis of collage-elicited interviews, develop Likert-type conservation attitude items based on these themes, then identify and recommend ways for qualitative research to utilise collage-elicited interviews and the Trello *app*. more widely.

## 4.3 Tools

### 4.3.1 Collage-elicited Interviewing as a Research Method

#### What is collage?

Collage is a visual art form with a long history. Derived by Picasso and Braque from the French verb *coller*, ‘to glue’ or ‘to stick together’ (Poggi, 1992), collage is “the process of cutting and sticking found materials onto a flat surface” (Butler-Kisber, 2010, p. 114). Popularised by 20th-century artists, including Picasso and Braque, collage forms visual representations through the selection, placement, and combination of disparate materials. These representations express new meanings outside of the materials’ original intended purpose. Various found and created materials, including fabric, paper, natural objects, photographs, and print clippings, are often employed. As Butler-Kisber (2010, p. 104) describes, “Collage creation involves working from the ‘heart to the head’ ... seeking fragments and glues (to piece) them together to express a feeling or sense of an experience or phenomenon rather than a particular idea.”

### What is collage-elicited interviewing?

Collage-elicited interviews utilise interviewee-created collages as conversational triggers. This interview type has been used to better understand attitudes and actions towards sea-level rise, investigate children's place attachment, and develop strategic plans for future scenarios (Paterson et al., 2020; Saunders, 2009; Sorin et al., 2012). This flexible, inclusive attitude-illuminating arts-based tool is suitable for a wide age range (adolescents; Awan, 2007; children; Huss & Cwikel, 2005; adults; Mannay, 2010) and accessible to those who feel they are less artistically able (Landgarten, 1994; Williams, 2002).

The collage-elicited interview helps create a "common language" (Williams, 2002) that, according to Vaughan (2005, p. 40), "...form(s) the basis of discussion and learning." Collages have the potential "to create new understandings and bring unconscious dimensions of experience to the fore." (Butler-Kisber, 2010, p. 118). Collages can capture participants' sense-making of their relationship to the present world based on their lived experience, as well as "to predict future events based on (those) observations" (Margolis & Zunjarwad, 2018, p. 600). The term 'elicitation' used in this research context is defined as "to elicit multiple perceptions, interpretations, and possibilities" (Schwartz, 1992, p. 13) to visualise rather than "to bring to light" (Collins English Dictionary, 2020).

The qualitative research community is increasingly incorporating collage into its methodological 'toolbox' to illuminate feminist, postmodern, and postcolonial methods of inquiry (Vaughan, 2005). Marginal voice participation in art gallery exhibitions (Gerstenblatt, 2013), researcher reflexivity (Lahman et al., 2019) and the struggles of experienced secondary school teachers (Culshaw, 2019) have also been explored. In summary, collage-elicited interviews are easy to administer, user-friendly, accessible irrespective of participants' self-perceived artistic ability or location, relatively inexpensive, and suited to participants from differing age groups and ethnicities (Butler-Kisber & Poldma, 2010; Gerstenblatt, 2013). This interview style also allows participants "to both 'show' and 'narrate' their experiences and lives." (Mannay, 2016, p. 64).

However, there are a few examples of thematic outcomes from collage-elicited interviews informing and enriching quantitative research, for example, local concepts of cultural tourism (Fernandez et al., 2010) and photo-elicited descriptive adjectives used to create a photo-semantic assessment survey instrument (Ball, 2014).

I anticipated that reflexive thematic analysis of collage-elicited ideas could be incorporated into a future quantitative study. My research thus goes a small way

towards confirming collage inquiry as a valuable qualitative tool with quantitative applications.

### 4.3.2 Trello as a Reflexive Thematic Analysis Coding Tool

#### What is Trello?

Trello, a digital cardwall application (Atlassian, 2020; Gossage et al.), is a collaborative teamwork project management tool. This *app.* enables the virtual 'hands-on' organisation of data, processes and ideas within and between participants' groups, incorporating personal or group boards built on a list and card system (Kaur, 2018).

To date, Trello has mainly been used by businesses and institutions for a variety of data manipulation purposes: hospital library information organisation and access (Kaur, 2018); knowledge management among non-profit organisations (Rathi & Given, 2017) and journal publication "...from ideation through promotion." (Fic, 2019, p. 15).

However, Trello offers more than data manipulation. Conner (2018) describes Trello as "afford[ing] rapid, collaborative, and colourful codification of insight." An application, therefore, that appears suited to qualitative research. A few examples exist of Trello as a reflexive thematic analysis tool. Wan (2018) utilised Trello when data coding Indigenous languages, while Watson (2019) investigated travel industry customers' automated booking system experiences. Watson (2019, p. 178) explains that Trello was "chosen as a simple and accessible tool to enable collaborative participation and efficient data processing while still producing usable results."

Trello has not been designed explicitly for reflexive thematic analysis. However, its functionality and flexibility enable Trello to be adapted as a reflexive thematic analysis tool for qualitative researchers. In particular, regarding the qualitative research phase, Trello provided the means to explore my research questions within the qualitative and quantitative research phases (Figure 3).

Trello facilitated reflexive thematic analysis of collage-elicited interview transcripts displaying participants' thoughts and actions about present-day and future worlds. These themes formed survey items investigating how individual attitudes and concerns might relate to future community-led conservation. As Butler-Kisber (2010, p. 116) explain, "Collage can be a way of conceptualising a response to a research question... a way of finding commonalities across collages ... new conceptualisations can emerge that respond to the question...".

I chose the Braun and Clarke (2020) reflexive thematic analysis approach as it can shed light on common conservation-related patterns stimulated by the collage-elicited participant interviews.

#### *Trello-assisted reflexive thematic analysis*

Trello (Atlassian, 2020), a cloud-based digital cardwall application, was initially designed to manage complex publication projects. Trello offers the same strengths as NVivo (QSR International, 2020), ease of use, documents, memos and images can be imported and coded on-screen (Welsh, 2002). Trello gave me a more tactile ‘hands-on’ interaction with the data. The programme’s hierarchical functionality (cards, labels, lists, boards) (Table 8) also provided the phased approach I needed, from coding data extracts to proposing candidate themes.

**Table 8**

#### *Locating Reflexive Thematic Analysis Phases Using Trello as a Hierarchical Coding Tool*

<b>Reflexive thematic analysis phases</b>	<b>Trello as a hierarchical thematic coding tool</b>
<b>Phase 2 – Coding</b>	Cards and labels
<b>Phase 3 – Generating initial themes</b>	Lists
<b>Phase 4 – Reviewing themes</b>	Boards
<b>Phase 5 – Defining and naming themes</b>	Boards

Note. Reflexive thematic analysis phases adapted from “Thematic analysis | a reflexive approach” by V. Braun and V. Clarke, 2020. <https://www.psych.auckland.ac.nz/en/about/thematic-analysis.html>

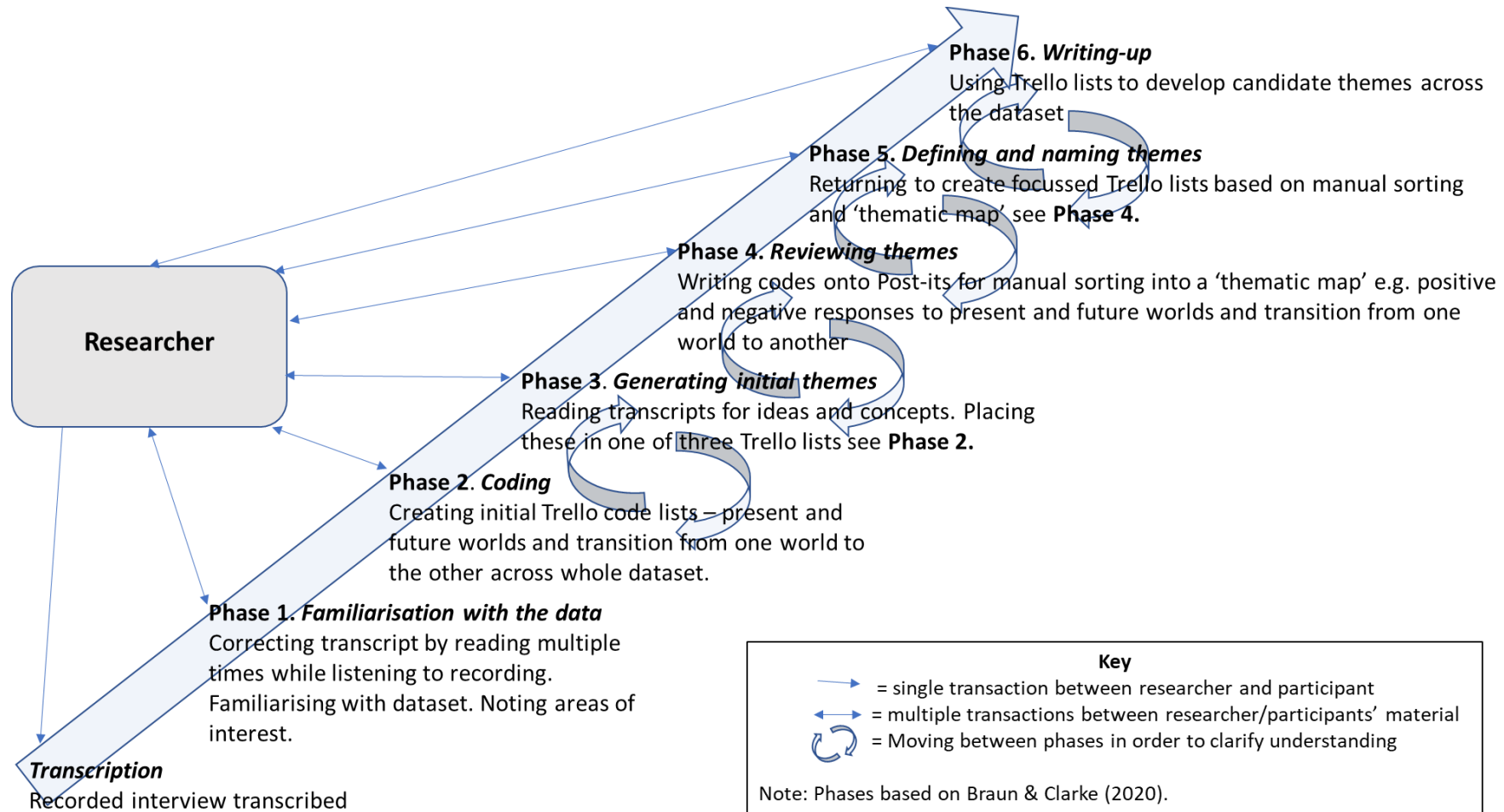
Each data extract could be considered and labelled (coded) on individual virtual cards. As codes developed and focused into candidate themes, the resulting information could be gathered into lists and, from there, candidate themes presented on boards. In brief, Trello functionality aligns with the Braun and Clarke (2020) reflexive thematic analysis phase approach.

#### **Researcher reflexivity**

Throughout the collage-elicited transcript reflexive thematic analysis, I adopted a deliberate multi-phased process that was linear, moving from phase to phase, and recursive, moving backwards and forwards between phases (Figure 10). This approach deliberately mirrors Braun and Clarke (2020) description of analysis as a “...typically a recursive process...”.

**Figure 10**

*Schematic of Trello App. as a Reflexive Thematic Analysis Process.*



Note. Phases adapted from “Thematic analysis | a reflexive approach,” by V. Braun and V. Clarke, 2020. <https://www.psych.auckland.ac.nz/en/about/thematic-analysis.html>.

Understanding current and future conservationists' thoughts about the present and future world and their place within it may help support future community conservation resilience. Consequently, I adopted two innovative and relatively underutilised qualitative methodological approaches, 1) collage-elicited interviews and 2) reflexive thematic analysis based on the Braun and Clarke (2020) approach, using a readily available web-based list tool – Trello (Atlassian, 2020).

#### 4.4 Method

The study investigated diverse participants' self-perceptions of their actions in the world today and in the future. Two research phases were undertaken - a pilot and a full study.

##### Participant recruitment

Participants for both the pilot and full study were deliberately recruited from a wide range of ages, educational backgrounds, conservation interests and involvement, and physical locations. I anticipated that a heterogeneous group would provide a variety of themes more representative of the general Aotearoa New Zealand public than if I had contributed the themes myself.

Participants were recruited through email invitations and social media posts. This approach was cost-effective, time-efficient, and encompassing, thus ensuring an initial separation between the interviewer and potential participants. Social media posts were distributed to potential community conservation volunteers through Aotearoa New Zealand's Bay of Islands Facebook and Bay of Islands community email platforms. Email invitations were sent to the Toimata Foundation (parent body of Enviroschools) for dispersal through Aotearoa New Zealand's national Enviroschool educators' networks. Enviroschools is Aotearoa New Zealand's only nationwide "environmental action-based programme where young people are empowered to design and lead sustainability projects in their schools, neighbourhoods and country." (Enviroschools, 2020). Emails were also sent to Bay of Islands Enviroschool and non-Enviroschool primary and secondary school principals inviting participation from their Years 8 and 13 students. Given that some participants were classified as vulnerable (under the age of 16 years), both the pilot and full study operated under Auckland University of Technology Ethics Committee approval (AUTEK Reference number 18/406).

I adopted a two-phase exploratory mixed methods approach, the qualitative component results underpinning the subsequent quantitative study. Triangulation uses multiple research techniques to examine a research question, thus further verifying the research

findings. “[It is an] attempt to map out, or explain more fully, the richness and complexity of human behaviour by studying it from more than one standpoint and, in so doing, by making use of both quantitative and qualitative data” (Cohen et al., 2007, p. 141).

My study asked the following questions, 1. What do people think about the present world and their place within it? and 2. What do people think about the future world and their place within it? These questions support this thesis’s overarching research question, “In the Aotearoa New Zealand context, do adult hope and adult conservation attitudes relate to current conservation action and future conservation intention?”

#### **Pilot study phase**

The pilot study phase determined whether the paperwork (information sheets, consent and assent forms, laddering questions) (Appendix B) and collage-elicitation interviews were age-appropriate. This phase also determined whether the recorded interviews produced the richness and breadth of data necessary for reflexive thematic analysis from a sample “large enough to capture a range of perspectives; not so large that you are drowning in data” (Braun & Clarke, 2017, p. 46). Five individuals (3 females; 2 males) aged 11 to 60 years from community conservation, primary, secondary, and tertiary student backgrounds participated (Table 9).

**Table 9***Pilot Study Participant Groups, Identification Codes, Locations, Recruitment Approach, Age, Gender, and Numbers in Sample*

<b>Participant group</b>	<b>Anonymous coding</b>	<b>Participant institution location</b>	<b>Recruitment approach</b>	<b>Age</b>	<b>Gender</b>	<b>Number in sample</b>
<b>Year 8 non-Enviroschool students</b>	P8non	Kerikeri High School, Bay of Islands, North Island	Email to Year 8 dean requesting research invitation be passed on to students	11-15	Female	1
<b>Year 13 non-Enviroschool students</b>	P13non	Kerikeri High School, Bay of Islands, North Island	Email to headteacher requesting research invitation be passed on to students	16-20	Female	1
<b>Community conservation</b>	Pcon	Bay of Islands community, North Island	Notice in local Facebook pages, community emails and Letters to Editor sections of local newspapers	31-60	Female/ Male	2
<b>Tertiary students (Education)</b>	Paut	AUT - Auckland University of Technology, Auckland, North Island	Email through the intranet to Science Faculty students requesting their participation in the research	26-30	Male	1
					<b>Total</b>	<b>5</b>

*Note.* Meeting with and interviewing the participants

I conducted all meetings and interviews in person. Each person participated in a two-step process; an initial scoping meeting followed by a collage-elicited recorded interview.

### Scoping meeting

Following initial contact by email, letter, or word of mouth (Table 9), potential participants were invited to an initial in-person meeting with me as interviewer and researcher. This meeting was held in a public place (e.g., school, library, café) at a time and date agreeable to the potential participant. Where that individual was under 16 years of age, an adult (their guardian, parent, or schoolteacher) other than me was present, thus satisfying any ethics concerns. At this initial meeting, I explained the reason for the research, the individual's possible role, and their likely time commitment. The potential participant was then given an age-appropriate information sheet, a consent form (for those 16 years and over), assent and consent forms (the assent form for the potential participant, if under 16 years of age; the consent form for their parent or guardian), and a box of collage materials (Appendix G). At this stage, and in the time leading up to the collage-elicited interview, three individuals decided not to continue their involvement in the research. Their reasons for not continuing included: "too busy", "not interested", "didn't have the necessary artistic skills", and "didn't have the time". Twenty individuals agreed to participate in the next stage of the research. I compiled and gave each participant a box of collage materials (Figure 11, Appendix G).

**Figure 11**

*Example of Box Containing Collage Materials Given to Each Study Participant*



The boxes varied in content. However, all boxes contained scissors, glue stick, sellotape, fabric, coloured cardboard and paper, coloured crayons, felt-pens, pencils, magazines, newspapers, A3 paper collage backing sheets, as well as varied craft materials including feathers, sequins, buttons, lace, ribbons, plastic plants, and raffia.

### **Collage making**

Each participant was asked to create two collages on the A3 backing paper provided, using materials from the collage box and self-identified materials participants found for themselves. The participants were asked, “While you are making your first collage, think about the world you live in today; the second collage should be about the world you would like to live in the future. You need to include a picture/drawing/illustration of yourself in both collages.” No further explanation was provided, either in what constituted today’s world or what period the “future world” referred to. The interviewer’s statements to the participants were deliberately vague, providing them with a broad interpretive ‘playing field’. The participants had up to four weeks of their own time to create their collages.

### Collage-elicited interview

The collage-elicited interview was held at a location of the participant's choosing under similar conditions to the initial scoping interview. During this meeting, the participant and I carried out a one-on-one recorded interview designed to elicit the participant's responses to the collages they had created. Participants brought with them their signed consent/assent forms and completed collages.

The participants responded to their collages in the same order, today's world followed by the future world. As the interviewer, I read aloud five open-ended laddering questions (Jacob & Furgerson, 2012; Reynolds & Gutman, 1988) (Appendix C) to the participants enabling them to respond to their collages in a semi-structured manner (Table 10).

**Table 10**

*Laddering Questions Used in the Collage-elicited Interview Phase*

Question	Question rationale
What do you like best about your picture?	Features of importance to the participant
What is important about x?	Functionality associated with that feature
Why is that important to you?	Higher benefits of the feature to the participant
How does (x) make you feel?	Emotional benefit of the feature to the participant
Is there anything else you would like to tell me about your picture?	All information of value to the participant has been elicited.

*Note.* Adapted from "Writing interview protocols and conducting interviews: Tips for students new to the field of qualitative research." by S. A. Jacob and S. P. Furgerson, 2012, *The Qualitative Report*, 17(42), p. 1-10 and "Laddering theory, method, analysis and interpretation." by T. J. Reynolds and J. Gutman, 1988, *Journal of Advertising Research*, Feb/March.

These questions elicited an open-ended free-flowing 'conversation' between me as interviewer and the participant as interviewee. The first question established those features of importance to the participant "What do you like best about your picture?". The second question queried any functionality associated with that feature "What is important about x?". While the third question explored the higher benefit of the feature to the participant, "Why is that important to you?" and the fourth question delved into the emotional benefit of the feature to the participant, "How does (x) make you feel?". The fifth question, "Is there anything else you would like to tell me about your picture?" ensured that all information of value to the participant had been elicited. Once all aspects of the initial feature had been elicited, the same sequence of probing questions was used on other features that had meaning for the participant. Once no new themes emerged, and saturation had been achieved, or the

participant indicated they wished to stop, the interview concluded (Grady, 1998), (Braun & Clarke, 2021b).

Pilot interviews ranged in length from 30 to 60 minutes. Each interview was recorded on a Galaxy A8 (2018) smartphone (Samsung Electronics, 2018) using a Samsung voice-recorder *app*.

### Transcription

Raji Unka, an independent contract transcriber, transcribed the MP3 audio recordings created during the collage interviews. The contractor was instructed to transcribe the recordings verbatim and include any speech disfluencies, such as fillers and pauses, repetitions, and overlapping talk. Once all recordings were transcribed, I listened to each audio recording while reading the relevant transcript. Any amendments or corrections identified were made on the transcript. Each transcript line was numbered to facilitate the identification of relevant or interesting text. As Terry and Braun (2009) described, data extracts presented in this paper differ slightly from the original transcripts to facilitate reading. The annotation [ ... ] indicates that “text not relevant to the analytic point being made” (Terry & Braun, 2009) has been deleted. Codes representing the individual’s group affiliation (Table 9), e.g., 8env (Year 8 student from an Enviroschool school), replaced participant names.

### Transition from pilot to full-study phase

Only two changes to the research design and methodology resulted from the pilot phase. A laddering question was reworded from “What does (x) do for you?” to “How does (x) make you feel?” and a question asking each collage creator how they would move between the present-day as depicted in their collage to their future world collage, was incorporated into the full study. This verbal discussion ‘bridge’, framed as a transitional question, “How did you get from one (the world of today) to the other (the world of tomorrow)?” enabled participants to describe what actions they would take to move from the world of today to that of tomorrow.

### Full-study phase

Twenty participants (5 males; 15 females) from various educational and environmental backgrounds, age groups and Aotearoa New Zealand locations (Table 11) participated in the full-study interview. The full group of participants ranged in age from 11 to 75 years; interview times from 11 to 37 minutes.

**Table 11***Full-study Participant Groups, Identification Codes, Locations, Recruitment Approach, Age, Gender, and Numbers in Sample*

<b>Participant group</b>	<b>Anonymous coding</b>	<b>Participant institution location</b>	<b>Recruitment approach</b>	<b>Age</b>	<b>Gender</b>	<b>Number in sample</b>
<b>Year 8 Enviroschool students</b>	8env	Russell Primary School, Bay of Islands, North Island	Email to headteacher requesting research invitation be passed on to students	11-15	Female	2
<b>Year 8 non-Enviroschool students</b>	8nonenv	Kerikeri High School, Bay of Islands, North Island	Email to Year 8 dean requesting research invitation be passed on to students	11-15	Female/ male	3/1
<b>Year 13 non-Enviroschool students</b>	13nonenv	Kerikeri High School, Bay of Islands, North Island	Email to headteacher requesting research invitation be passed on to students	16-20	Female	2
<b>Tertiary students (Science)</b>	Aut	AUT - Auckland University of Technology, Auckland, North Island	Email via the intranet to Science Faculty students requesting their participation in the research	16-30	Female/ male	6/2
<b>Community conservation</b>	Con	Bay of Islands community, North Island	Notice in local Facebook pages, community emails and Letters to Editor sections of local newspapers	71-75	Male	1
<b>Environmental educators</b>	Enved	Dunedin, South Island	Letter to Toimata Foundation CEO	16-35	Female/ male	2/1
					<b>TOTAL</b>	<b>20</b>

## Coding and reflexive thematic analysis process

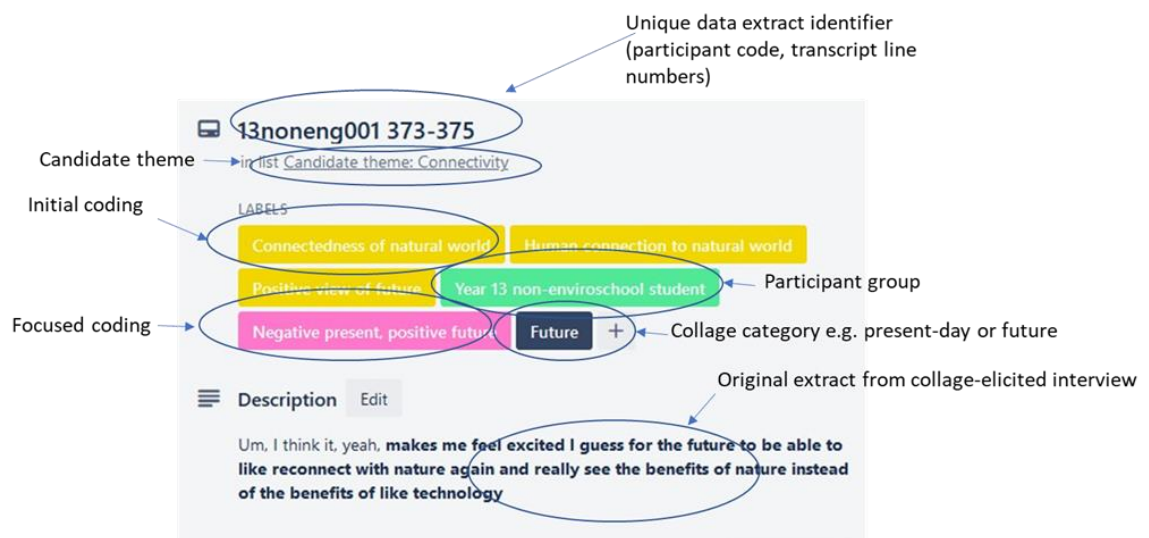
The six reflexive thematic analysis phases (Braun & Clarke, 2020): 1. familiarisation with the data, 2. coding, 3. generating initial themes, 4. reviewing themes, 5. defining and naming themes, and 6. writing up, framed the coding and thematic analysis aspects of this research. The phases offered a rigorous, objective framework to analyse the data and support the credibility of reflexive thematic analysis as a trustworthy qualitative process (Nowell et al., 2017). An inductive data-driven approach was taken throughout the reflexive thematic analysis process (Boyatzis, 1998; Braun & Clarke, 2006).

### Phase 1 – Familiarisation with the data

Throughout the coding process, a copy of the research questions was visible to me, thus ensuring coding related to these questions. I familiarised myself with the data by reading and re-reading each transcript. Becoming familiar with the dataset was the first step in creating a uniquely identifiable digital card in Trello for each text extract (Figure 12).

#### Figure 12

*Screenshot of a Trello Coding Card Showing Unique Data Extract Identifier, Original Extract, Initial and Focused Coding, Participant Group, Collage Category and Candidate Theme*

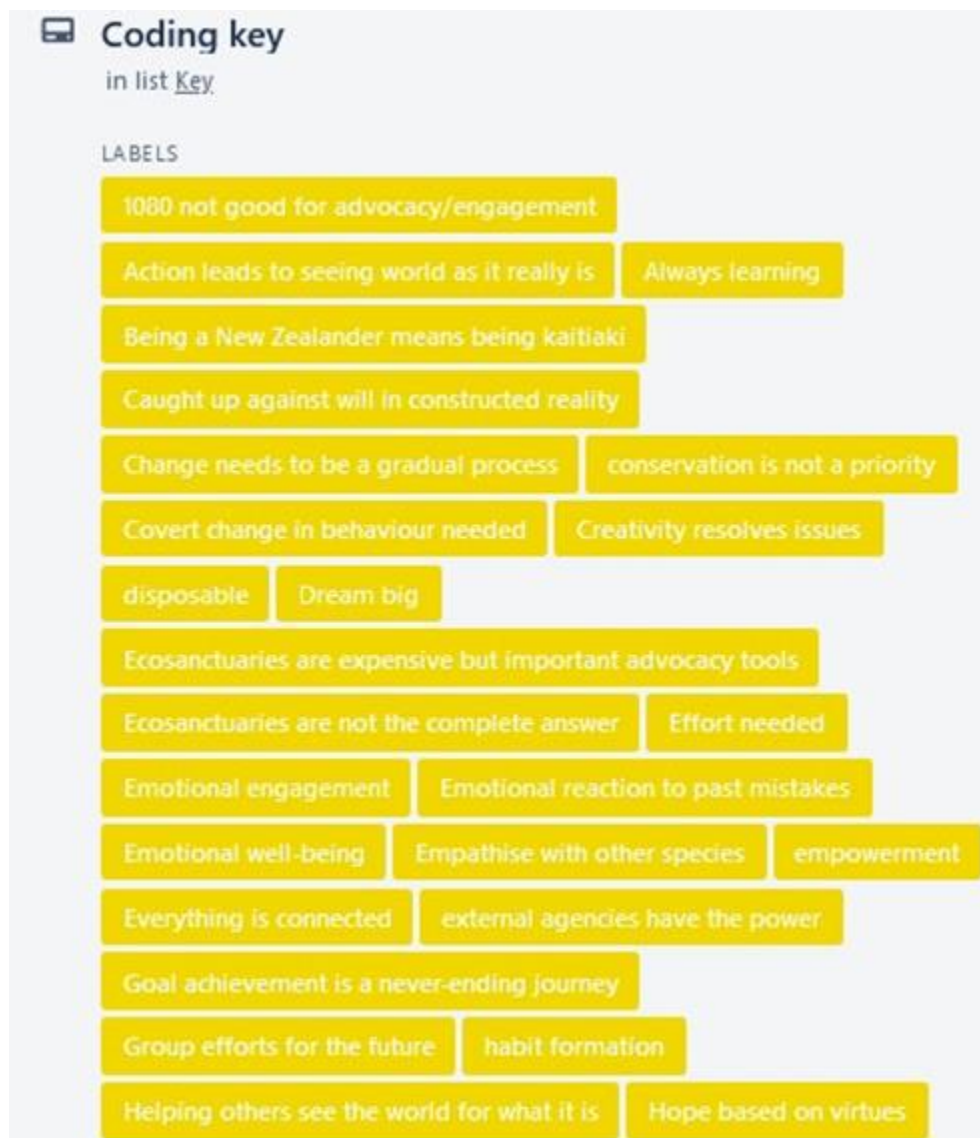


### Phase 2 – Coding

I ensured within-transcript coding consistency by fully coding each transcript before moving on to a different one. I encapsulated each text extract's main thought/idea as a Trello label. These labels were all the same colour (yellow) (Figure 13) to reduce any unintentional hierarchical ordering or relationships and support the bottom-up approach from code to sub-theme to candidate theme.

**Figure 13**

*Screenshot Example of the Coding Key in Trello*



**Figure 14**

*Screenshot of Participant Group Labels in Trello*



Colour-coded labels identified participant groupings (Figure 14); dark blue labels provided the relevant category for each collage or collage transition transcript – present, transition or future (Figure 15).

**Figure 15**

*Screenshot of Collage-type Labels in Trello*



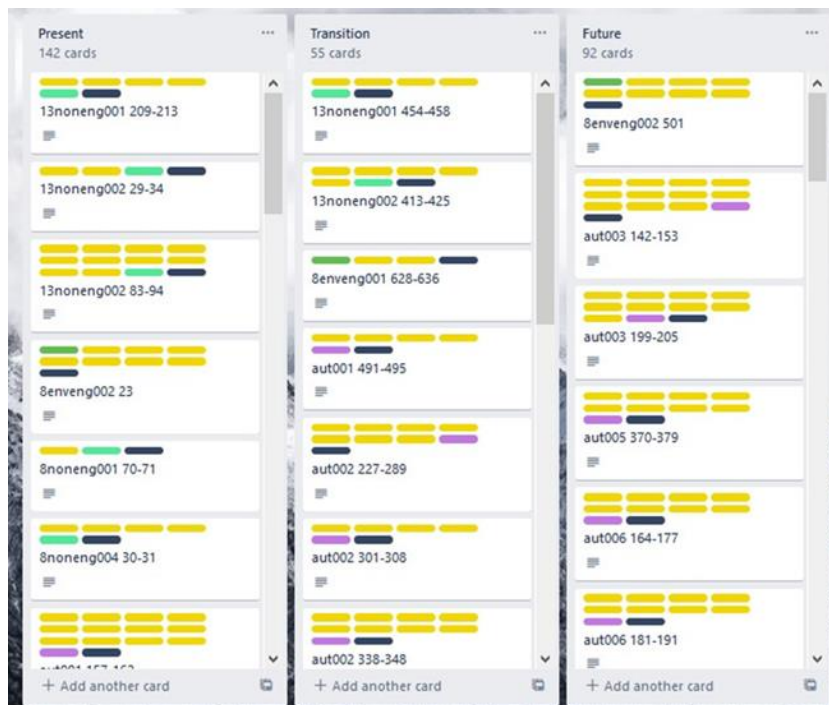
Once all transcript extracts were coded, I re-examined all coded extracts to check that all possible codes had been used.

### **Phase 3 – Generating initial themes**

The collage-elicitation interview process provided the following three distinct “broader patterns of meaning” (potential themes) (Braun & Clarke, 2020) related to the collages, 1. present-day world; 2. future world, and 3. the participant’s transition between the present and future worlds. I created a second Trello board with the following three lists, 1. Present, 2. Transition, and 3. Future (Figure 16).

**Figure 16**

*Screenshot in Trello of the Present, Transition and Future Lists*



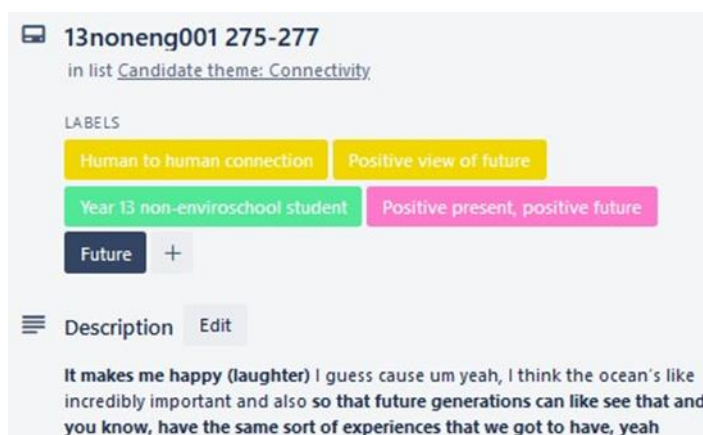
These lists reflected the two collages each participant produced (present-day and future world) and the participants' verbal comments as they explained how they would move between the worlds portrayed in their collages.

#### Phase 4 – Reviewing themes

Cards with codes that appeared to group together were moved into lists within the appropriate Trello board. Related code labels in the same list were coloured the same, for example, pink (Figure 17).

**Figure 17**

*Screenshot of a Participant's Coded Data Extract in Trello*



Where cards had multiple codes, the card was duplicated and inserted into the correct lists. In order to establish some physical and psychological distance from the coding process, I wrote the codes onto sticky paper notes, coloured them similarly to the Trello labels, and grouped these notes into candidate sub-themes (Figure 18).

**Figure 18**

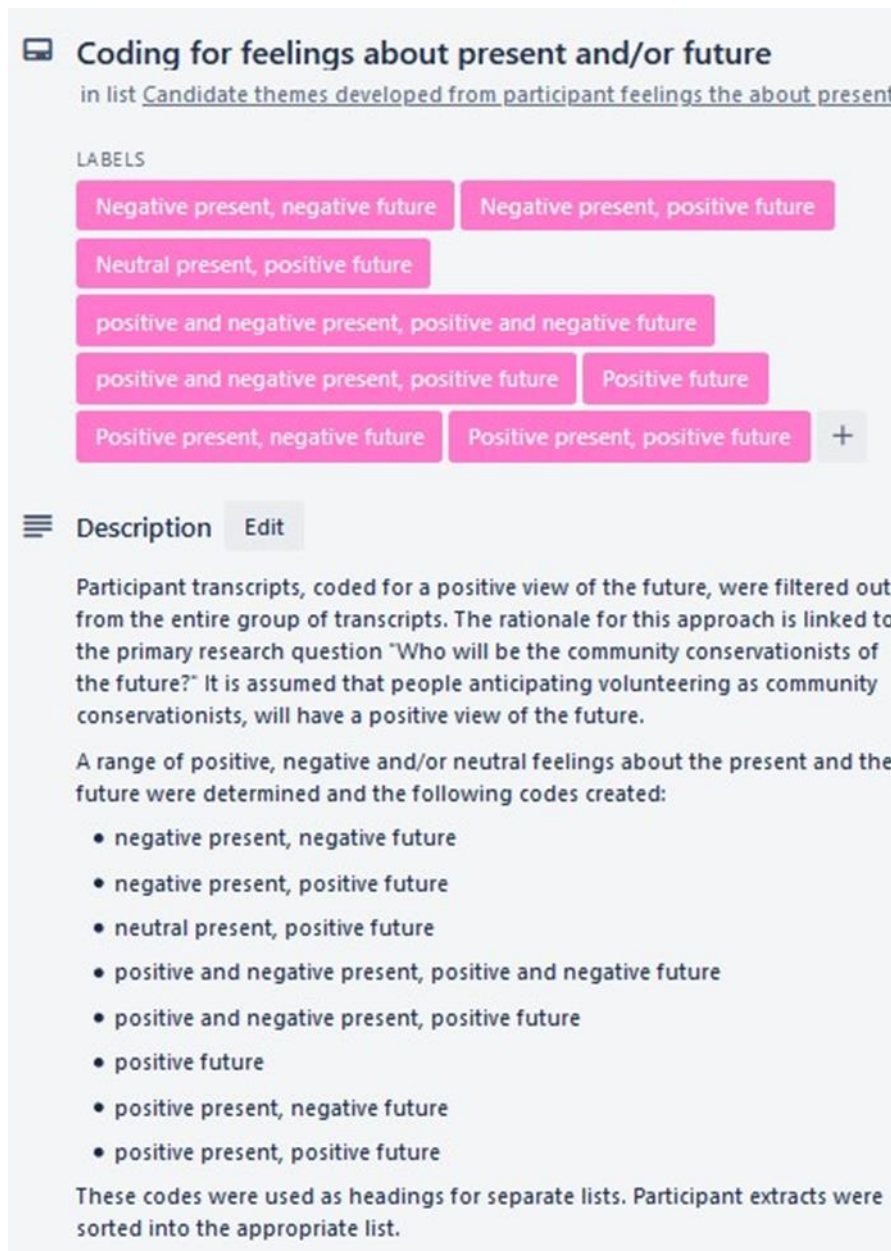
*Coloured Sticky Paper Notes Facilitated the Move from Individual Codes to Candidate Sub-themes. For Example, Mapping Codes Expressing Positive Feelings Towards the Present, Positive Feelings Towards the Future*



Participant comments about and descriptions of their present-day or future world collage or collage elements were couched in positive, negative, or neutral terms. One means of approaching and understanding participants' coded responses was to filter these comments using a positive view of the future filter. The rationale for this approach links to my primary research question, "In the Aotearoa New Zealand context, do adult hope, and adult conservation attitudes relate to current conservation action and future conservation intention?" I have assumed that people anticipating volunteering as community conservationists will have a positive view of the future. A range of positive or negative feelings about the present and the future were determined, resulting in several filter combinations (Figure 19).

**Figure 19**

*Screenshot of a Trello Card Providing Descriptions of Phase 5 Filters.*

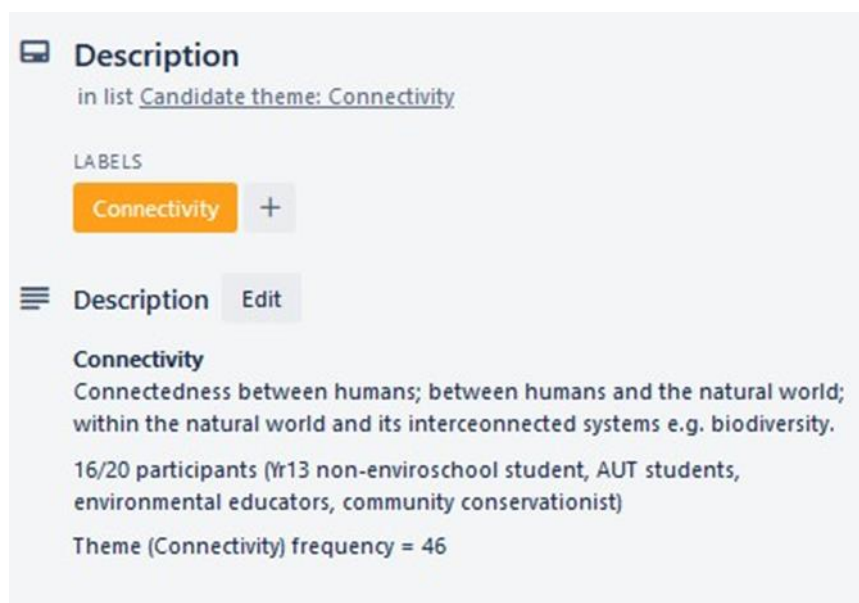


*Note.* These filters are varied combinations of positive, negative, or neutral feelings about the present and the future related by collage-elicited interview participants.

Coded data extracts were separated into the appropriate lists based on these temporal affective filters (Figure 19). All previously developed codes were stripped out from the individual data extracts. Ideas coalescing from the extracts filtered by the Positive view of future code, for example, were then given codes. These codes were attached to each extract and recorded in the images attached to each list on this board. Once all extracts had been coded, the codes were mapped for each list. Candidate themes were developed from these hierarchical maps (Figure 20).

**Figure 20**

*Screenshot in Trello of Description, Connectivity and Participant Data Related to Connectivity – a Candidate Theme*



#### Phase 5 – Defining and naming themes

Once candidate themes had been formed through the Phase 4 sorting and collating process, I returned to the individual interview extracts. I read them in the context of the candidate theme to see whether they still related to that theme. I recoded the extract if the data extract and candidate theme did not align. If they did align, the appropriate candidate theme was added as a label to that data extract card. Labelling interview extracts with candidate themes highlighted quotes suitable for writing up.

During Phase 5, the following two analyses, a form of triangulation (Nowell et al., 2017), were carried out on the candidate themes: 1. participation spread and 2. theme frequency (Table 12). Participation spread determined whether a range of participants supported the candidate theme; theme frequency or prevalence counted the number of times data extracts relating to the candidate theme were mentioned by participants (Braun & Clarke, 2006) (Table 12).

**Table 12***Candidate Theme Definitions, Participation Spread and Frequency*

<b>Candidate theme</b>	<b>Candidate theme definition</b>	<b>Participation spread</b>	<b>Theme frequency</b>
Connectivity	Connectedness between humans, between humans and the natural world, within the natural world and its interconnected systems, e.g. biodiversity.	16/20 participants (Yr13 non-Enviroschool student, AUT students, environmental educators, community conservationists)	46
Group action	Group conservation action is more effective than acting as an individual.	14/20 participants (Year 8 Enviroschool and non-Enviroschool students, Year 13 non-Enviroschool students, AUT students, environmental educators, community conservationist)	29
Commitment	Effort is needed to carry out the conservation work necessary.	11/20 participants (Yr8 Enviroschool and Yr8 non-Enviroschool students, Yr13 non-Enviroschool student, AUT students, environmental educators, community conservationist)	20
Learning cycle	Learning is a necessary ongoing process as one learns so that learning is taught to others, perpetuating the learning cycle.	10/20 participants (Yr13 non-Enviroschool student, AUT students, environmental educators, community conservationists)	22
Unconditional belief	Belief in the ability of nature to heal itself, a higher being will resolve issues, and science will find solutions to problems.	7/20 participants (Yr13 non-Enviroschool student, AUT students, environmental educators)	15

Once the reflexive treatment of interview abstracts and candidate themes had been completed, I created a descriptive paragraph for each candidate theme based on codes and examples recorded (Table 12).

## 4.5 Results/Analysis (Phase 6 – writing up)

### 4.5.1 Collage-elicited Interviews

All pilot and full study participants created collages of themselves in the present-day and future worlds. Some participants created two separate collages (Figure 21 and Figure 22).

**Figure 21**

*World in the Present-day Collage*



*Note.* By P13non001, 2019, collage, mixed media.

**Figure 22**

*World in the Future Collage*



Note. By P13non001, 2019, collage, mixed media.

Others combined the present-day and future worlds and their relationship to these worlds within the same collage (Figure 23).

**Figure 23**

*Combined World in the Present-day and World in the Future Collage.*



*Note.* By 8env001, 2019, collage, mixed media.

Some created illustrations using felt-tip pens; others incorporated natural found items such as ponga (tree-fern) fronds (Figure 24 and Figure 25).

**Figure 24**

*Combined World in the Present-day and World in the Future Collage.*



*Note.* By Con001, 2019, collage, mixed media.

A further group incorporated movable elements within their collages, adding a further level of meaning (Figure 25 and Figure 26).

**Figure 25**

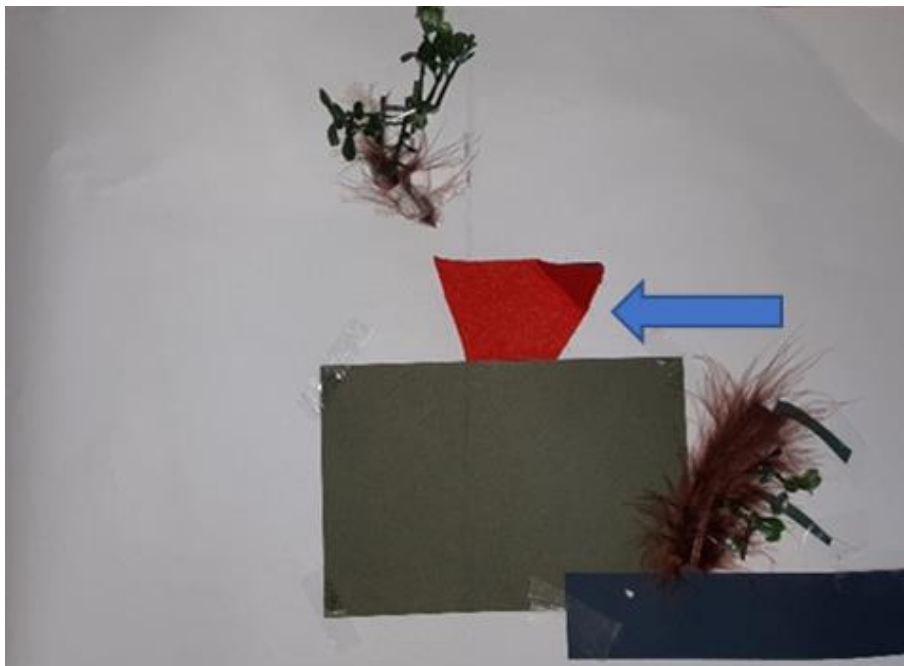
*World in the Present-day Collage.*



Note. By Pcon001, 2019, collage, mixed media.

**Figure 26**

*World in the Future Collage.*



Note. By Pcon001, 2019, collage, mixed media.

Arrow indicates collage element movement from right to left

Irrespective of age, artistic ability, and cultural background, participants responded enthusiastically to creating collages (Figure 27 to Figure 32), with many demonstrating stylistic

continuity over time using the same materials in present-day and future collages (Figure 27 to Figure 32).

**Figure 27**

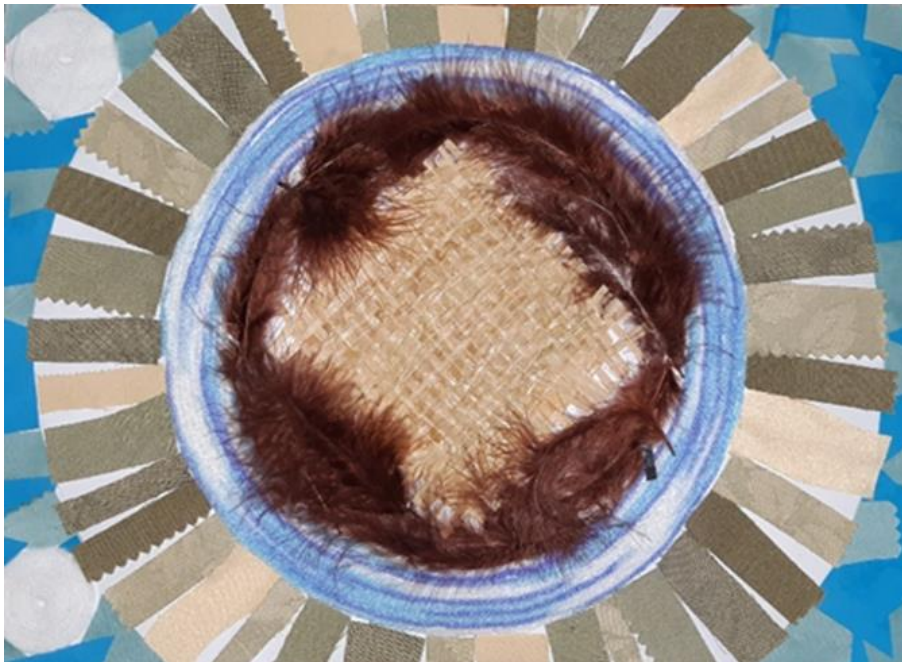
*World in the Present-day Collage.*



*Note.* By Aut001, 2019, collage, mixed media.

**Figure 28**

*World in the Future Collage*



*Note.* By Aut001, 2019, collage, mixed media.

**Figure 29**

*World in the Present-day Collage.*



*Note.* By Enved001, 2019, collage, mixed media.

**Figure 30**

*World in the Future Collage.*



*Note.* By Enved001, 2019, collage, mixed media.

**Figure 31**

*World in the Present-day Collage.*



*Note.* By 8nonenv005, 2019, collage, mixed media.

**Figure 32**

*World in the Future Collage.*



*Note.* By 8nonenv005, 2019, collage, mixed media.

#### 4.5.2 Trello-assisted reflexive thematic analysis

Six candidate themes (Figure 33), based on codes derived from data extracts exhibiting feelings about the present and the future (Figure 34 to Figure 38), were assembled: Commitment, Connectivity, Group action, Learning cycle, Practical solutions, and Unconditional belief. The candidate theme, "Practical solutions", coalesced from examples of practical conservation

action provided by the study participants, pest and pet animal control, planting natives, and protected areas (eco-sanctuaries, pest-free islands, mainland islands, private national parks).

**Figure 33**

*Screenshot of the Six Candidate Themes Described Through Trello-based Analysis of Collage-elicited Interviews*

**Candidate themes**  
in list [Candidate themes developed from participant feelings the about present and/or future.](#)

LABELS

- Commitment
- Connectivity
- Group action
- Learning cycle
- Practical solutions
- Unconditional belief
- +

ADD TO CARD

- Members
- Labels
- Checklist
- Due Date
- Attachment
- Cover

POWER-UPS

- Butler Tips (3)
- Get More Power-Ups

ACTIONS

- Move
- Copy
- Make Template
- Watch
- Archive

**Description** Edit

These candidate themes are based on codes derived from extracts exhibiting feelings about present and/or future

**Commitment**  
Effort is needed to carry out the conservation work necessary.

**Connectivity**  
Connectedness between humans; between humans and the natural world; within the natural world and its interconnected systems e.g. biodiversity.

**Group action**  
Group conservation action is more effective than acting as an individual.

**Learning cycle**  
Learning is a necessary ongoing process. As one learns, so that learning is taught to others who in turn perpetuate the learning cycle.

**Practical solutions**  
Examples of practical conservation action: pest and pet control, planting natives, protected areas (ecosanctuaries, pest-free islands, mainland islands, private national parks).

**Unconditional belief**  
Belief in ability of nature to heal itself, a higher being that will resolve issues, science to find solutions.

**Figure 34**

*Connectivity Theme and Supporting Data Extract from 13noneng001*

13noneng001 454-458  
in list [Candidate theme: Connectivity](#)

LABELS

- Acting in a group
- Human connection to natural world
- Influencer/motivator
- Positive view of future
- Year 13 non-enviroschool student
- positive and negative present, positive future
- Transition
- +

Description Edit

I think we just need to keep like kind of letting people know that like we really need to take action and just like even like, like there's like quite a lot of celebrities who will like, putting it out there that the environment needs changing. So I feel like just doing things like that, encouraging people to take actions to save the environment I guess and we'll get there.

**Figure 35**

*Group Action Theme and Supporting Data Extract from 8noneng004*

8noneng004 30-31  
in list [Candidate theme: Group action](#)

LABELS

- Acting in a group
- Effort needed
- Positive view of future
- Year 8 non-enviroschool student
- Negative present, positive future
- Present
- +

Description Edit

I think it sort of makes me feel sort of sad but not like, I feel like hopeful that we can do something about it if everyone does something.

Figure 36

Learning Cycle Theme and Supporting Data Extract from Aut002

**aut002 338-348**  
in list [Candidate theme: Learning cycle](#)

LABELS

- Human connection to natural world
- Positive view of future
- Teaching/learning
- AUT student
- positive and negative present, positive future
- Transition +

Description Edit

I am of Pasifika descent as well as Māori and so I have that knowledge just naturally instilled in me because I grew up with that lifestyle of you can't fish at certain times because you need to make sure that their population replenishes, you can't harvest at certain times, all these kind of things and it was just, you just grow up with that mindset thinking that everyone else did too but then coming to university its taught me that actually a lot of people don't realise that, they don't have that thought and so the way, the reason why I see myself in the middle is because I can be an educator of that, I can teach more people, I can get that word out and we can start living those ways to ensure the the survival of our natural environment.

Figure 37

Unconditional Belief Theme and Supporting Data Extract from Enved003

**enved003 167-171**  
in list [Candidate theme: Unconditional belief](#)

LABELS

- Acting in a group
- Ecosanctuary
- Goal achievement is a never-ending journey
- Human connection to natural world
- Positive view of future
- Unconditional belief
- Environmental educator
- Positive present, positive future
- Future +

Description Edit

So, yeah, like I really feel really grateful for my work and for my life and I do feel like I just want to do everything I can with my life but I know that I'm part of something that's like so much bigger than me that it's infinite and it will outlive me in this physical form and that's okay. So I think, as I like to say, it's the ecosanctuary, not the ego sanctuary.

**Figure 38**

*Commitment Theme and Supporting Data Extract from Enved001*



Statements have been developed to test candidate theme resonance with a wider Aotearoa New Zealand public in the quantitative research phase (Table 13).

**Table 13**

*Themes Derived from Collage-elicited Interview Transcripts Reframed as Statements*

Themes	Statements
Connectivity	I feel connected to the natural world. I feel connected to other people.
Practical action	I believe nature needs our help to heal. The actions of individuals are important for the future of the natural world.
Group action	The actions of groups are important for the future of the natural world. I believe teamwork and collaboration are important for finding solutions to future problems.
Learning cycle	There is always more to learn about the natural world. I can help others learn about the natural world.
Unconditional belief	I believe that nature will heal itself. I believe that science and technology are important for finding solutions to future problems.
Commitment	I am committed to looking after the natural world. Looking after the natural world takes effort.

These statements will be presented as 8-point Likert-type scales (Figure 39) as part of a quantitative survey of Aotearoa New Zealand public conservation action and hopefulness levels in **Chapter 5**. This survey will form part of the second phase of my mixed-method research into current conservation actions and future conservation intentions.

**Figure 39**

*Example of Statement Derived from Reflexive Thematic Analysis of Collage-elicited Interview Transcripts.*

The actions of groups are important for the future of the natural world.							
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Definitely false	Mostly false	Somewhat false	Slightly false	Slightly true	Somewhat true	Mostly true	Definitely true

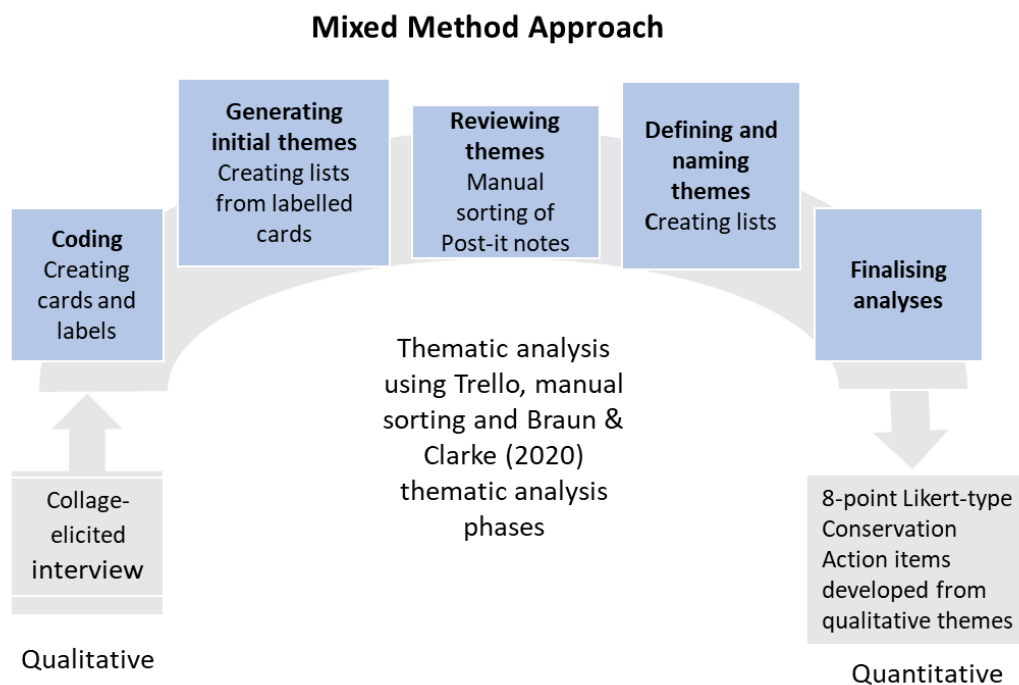
*Note.* Adapted from “Development and validation of the State Hope Scale,” by C. R. Snyder, S. C. Simpson, F. C. Ybasco, T. F. Borders, M. A. Babyak and R. L. Higgins, 1996, *Journal of Personality and Social Psychology*, 70, p. 321-335.

## 4.6 Discussion and Recommendations

Collage-elicited interviews and Trello-based reflexive thematic analysis are two approaches currently underutilised in qualitative research. In combination, these approaches elicited six themes relating to the thoughts of these Aotearoa New Zealanders about their place in both their present and future worlds and the actions they might take to move from the former to the latter. Through the development of Likert-type scale statements, the themes also provided a practical way of utilising qualitative research results in the quantitative phase of the intended mixed-method study (Figure 40). Thus, potentially supporting the study’s overarching research question and subsequent investigation into “In the Aotearoa New Zealand context, do adult hope, and adult conservation attitudes relate to current conservation action and future conservation intention?”

**Figure 40**

*Qualitative and Quantitative Aspects of a Mixed-method Study. Themes from Collage-elicited Qualitative Interviews Analysed Using Trello, and Manually-sorted Sticky Paper Notes Contribute to Creating Likert-type Conservation Action Items.*



*Note.* Adapted from “Likert Scale,” by P. E. Spector, 2004. In M. S. Lewis-Beck, A. Bryman, and T. F. Liao (Eds.), *The Sage Encyclopedia of Social Science Research Methods*, 2, p. 572-573. Thousand Oaks, CA: Sage Publications. Reflexive thematic analysis phases adapted from “Thematic analysis | a reflexive approach,” by V. Braun and V. Clarke, 2020. <https://www.psych.auckland.ac.nz/en/about/thematic-analysis.html>.

However, while many actual and potential benefits are associated with these tools, there are also some significant limitations. These limitations are explored, and possible solutions are suggested.

#### **Collage-elicited interviews – actual and potential benefits**

Collages are an underutilised arts-based tool capable of eliciting rich data from various participant age groups, physical abilities, cultures, and backgrounds. Collage creation is inexpensive and readily accessible, and in this study, participants enthusiastically engaged in collage-making, irrespective of their self-professed artistic ability. Some combined both worlds (today and future) in the same collage; others chose to present two worlds separated by five minutes to many years, while others created moving parts in their collages to express their ideas. Collage creation also reduces potential researcher influence by enabling participant creativity and individuality. In summary, collage creation enables participants’ thoughts, ideas, emotions, or concepts to be externalised and made visible to the researcher in a non-directed

way. Raffaelli and Hartzell (2016, p. 25) state, “Collage did not seem to carry any expectations about what a piece should look like or instil a fear of producing something that could be misunderstood or judged.”

Collage-elicited interviews may also help alleviate the tyranny of distance, including cultural, pandemic-imposed, and physical. First, interviews between participants from differing cultures or higher and lower rank individuals may necessitate eye gaze avoidance; this may be achieved by focussing on the collage rather than making direct eye contact (Duranti, 1992). Second, during the COVID-19 pandemic, where participants and researchers are necessarily physically distanced, online collage-elicited interviews may enable qualitative data collection to continue (Torrentira, 2020). Third, participants in remote locations could be more accessible to researchers without incurring travel time and expense. Shapka et al. (2016) suggest that data quality is unaffected irrespective of data collection mode (online vs face-to-face). However, access to and experience of the necessary online technology should be considered when working with remotely located participants.

#### **Collage-elicited interviews – limitations and solutions**

Collage-elicited interviewing has some limitations, particularly concerning participants with disabilities. These limitations can be resolved – the visually impaired may benefit from texturally varied collage materials, while able-bodied assistance might help those with physical limitations by placing materials under the interviewee’s instruction.

While collage materials were selected and provided by me, study participants were encouraged to use as much or as little as they liked of the materials provided and invited to incorporate any found materials (by the participant). This strategy gave all participants the basic ‘building blocks’ needed to construct a collage without incurring any financial or time costs.

#### **Reflexive thematic analysis**

Reflexive thematic analysis, whether framed using NVivo or Trello, needs qualification. As a qualitative method, such data extract coding and analysis are contextual; it is about understanding meaning, describing “one story among many that could be told about the data” (Braun & Clarke, 2013, p. 20) and requires researchers with “imaginative insight” (Maher et al., 2018). Interestingly, my imaginative insights identified a significant gap in participant responses during the pilot phase. The laddering questions let the participants discuss their present-day and future world collages. However, they did not identify nor verbalise their mechanisms enabling them to move between the two timeframes. I identified the need for a

bridging question, “How did you get from the world of today to the world of tomorrow?” This question helped participants frame their collage-elicited thoughts as potential actions.

#### Trello - benefits

Trello software is a free, easy-to-use, intuitive application. Trello users are well-supported with online tutorials, helplines and chatgroups. Working documents can be shared digitally, enabling virtual teams to collaborate on projects, and results can be readily copied into reports and other documentation. Trello provides an effective platform based on the six-phase Braun and Clarke (2020) process for data extract sorting, coding and, eventually, theme development. Images and text can be easily attached to lists, but above all, Trello offers a reflexive functionality. Cards, labels, lists, and boards can be ‘dragged and dropped’ and filtered using several pieces of information, thus enhancing and refining the qualitative researcher experience and potentially providing a more relational form of cognition (Douglas & Nil Gulari, 2015) than sequential. Manual methods, of which Trello is arguably a digital version, support the relational cognition necessary for coding practice.

#### Trello – limitations and solutions

In terms of reflexive thematic analysis, Trello does have some specific limitations. Labels are only available in a relatively restricted colour palette (Jones, 2020), potentially constraining the number of individual codes. Screen size restricts the visual space within which the researcher can work; this might be ameliorated by combining traditional material methods such as sticky paper notes and large sheets of paper (Maher et al., 2018). A more serious limitation is the inability to view or retain the iterations a board goes through. However, this can be addressed by consecutively dating labelling board versions. Despite these limitations, I found Trello a relatively simple-to-use tool for data storage and management, coding, and candidate theme development.

## 4.7 Conclusion

**Chapter 4** described how I used two under-utilised qualitative research methods, collage-elicited interviews and Trello, as a reflexive thematic analysis coding tool. Interview participants came from a wide range of ages, educational stages, backgrounds, and Aotearoa New Zealand locations. Study participants created present-day and future-located collages that were rich in personal meaning. Collage-elicited interviews made this personal meaning audible and visible to the researcher and a wider audience.

As participant Aut004 said:

“I believe a collage does a much better job of drilling down that message into their conscience and motivating them to do better than well what they do basically.” (lines 152-155, 175-179)

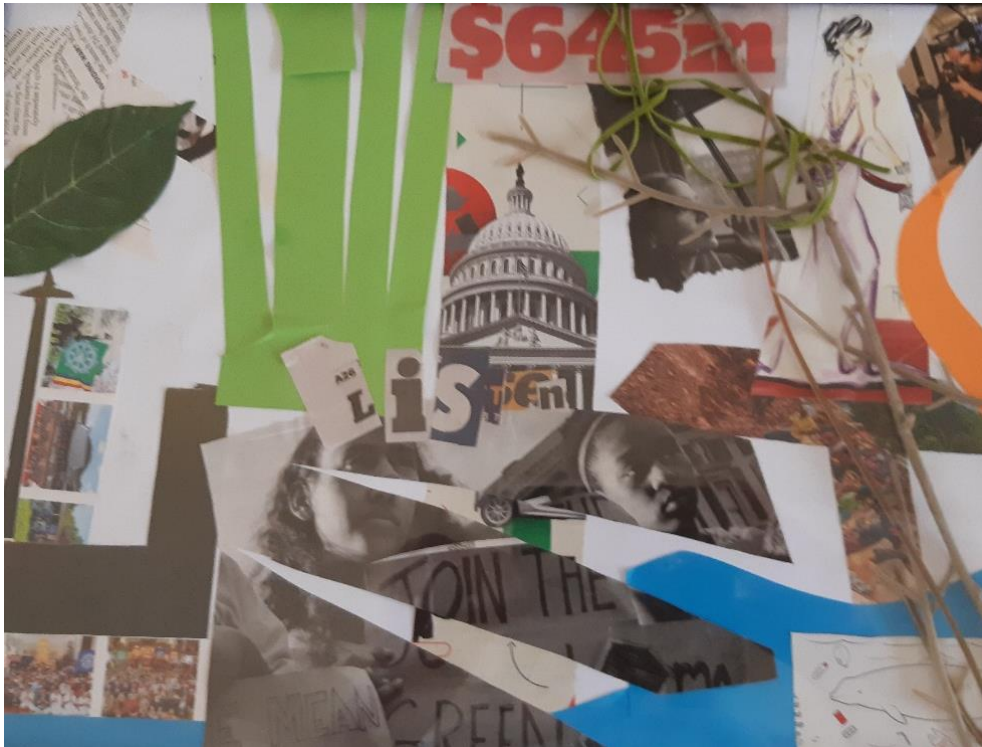
This chapter suggests that Trello offers readily achievable adaptation, an easy-to-use, economical, flexible yet robust means of qualitatively analysing text and assisting theme development for subsequent use in the quantitative phase of a mixed-method study.

My research also indicates that the collage-elicited interview approach undertaken in this chapter is a valid means of developing conservation attitudes. Six themes were identified, 1. commitment to the natural world, 2. connectivity to the environment and other people, 3. group action, 4. learning cycle, 5. practical solutions, and 6. unconditional belief.

Twelve Likert-type conservation attitude items based on the conservation themes have been developed. This qualitative approach can describe Aotearoa New Zealand conservation attitudes and thus develop an understanding of the motivations supporting current conservation actions and future conservation intentions. This approach will be incorporated into **Chapter 5**, the quantitative phase of this thesis.

Chapter 5 Relationships between Hope, Conservation Attitudes,  
Current Conservation Action, and Future Conservation  
Intention

*World in the Present-day*



Note. By AUT008, 2019, collage, mixed media.

*World in the Future*



Note. By AUT008, 2019, collage, mixed media.

In this chapter, I achieve my third research objective by investigating the relationships between hope, conservation attitudes, current conservation action and future conservation intention. This quantitative investigation incorporates and builds on the qualitative findings reported in **Chapter 4**.

*Objective 3: Exploring the relationships between hope, conservation attitudes, current conservation action, and future conservation intention*

To achieve my third objective, I developed a digital Hopefulness and Conservation Action intercept survey (Appendix E) incorporating current conservation attitude items, conservation action questions, the Adult Hope State Scale (Snyder et al., 1996), and demographic questions. Second, I piloted and then surveyed adults in various Bay of Islands, Aotearoa New Zealand locations. Third, I analysed the relationships between hope, conservation attitudes, current conservation action, and future conservation intention.

A version of this chapter is under review with the international peer-reviewed publication *Discover Sustainability*. Ough Dealy, H. R., Jarvis, R. M., Young, T., Maharaj, K., & Petterson, M. (Under review). The role of hope in current conservation actions and attitudes and future conservation intentions

## 5.1 Abstract

Current community-led conservation (CLC) actions support present and future biodiversity. Present-day conservation volunteer efforts are measurable; however, future CLC activity is uncertain. Understanding what motivates volunteers to take part in CLC activities is therefore essential. This study investigates the relationships between hope, conservation attitudes, current conservation action, and future conservation intention. Snyder's Adult Hope State Scale is used to explore the relationship between hope, conservation attitudes, self-reported current conservation actions, and future conservation intentions (planting, weeding, predator control) of 243 adult Aotearoa New Zealand participants. Hope and conservation attitudes relate differently to current conservation action and future conservation intention. Specifically, hope relates to future conservation intention, as do attitudes of connection to nature, connection to other people, and commitment to the natural world. Other attitudes include feeling able to help other people learn about the natural world, the importance of scientific and technological interventions, and the relative importance of individual effort, teamwork, and collaboration. However, hope negatively correlates with the belief that nature could heal itself. Current conservation action is solely related to attitudes of connection to nature, connection to other people, commitment to the natural world, and helping others learn about

the natural world. Hope does not associate with current conservation action. The relationship between conservation attitudes and hope to current conservation action and future conservation intention is complex. Understanding what motivates volunteers to undertake conservation action is critical to designing sustainable CLC projects that deliver positive outcomes for biodiversity in the long term.

## 5.2 Introduction

Global biodiversity change is one of our most pressing environmental issues (United Nations Environment Programme, 2021). Community-led conservation (CLC) group biodiversity restoration efforts reduce biodiversity decline (Bayliss, 2003; Russell et al., 2015; Wiederholt et al., 2015). In Aotearoa New Zealand, successful biodiversity restoration entails planned, sustained actions, including controlling invasive alien animal species (e.g., possums, rats, mustelids, and feral cats), planting endemic species, and removing invasive exotic plants (weeding). Consequently, CLC group members are active predator controllers, planters, and weeders (Bryce et al., 2011; Bury, 2006; Cooper et al., 2019; Miller et al., 2020; Peters et al., 2015). Without future commitment by individuals to the long-term sustainability of present-day conservation actions, CLC achievements, by implication, are uncertain. Despite such uncertainty, conservation volunteers, who may neither see nor experience the results of their actions, continue investing time, commitment, and effort. It is essential to understand what motivates CLC volunteers to undertake conservation actions now and what might motivate them to act in the future. Understanding ways of improving the long-term sustainability of CLC is vital in stemming worldwide biodiversity decline (Johnson et al., 2017).

Encouraging and sustaining conservation volunteer efforts is essential, but understanding how to do so is complicated. Joy (2020) describes volunteering as “a sustained and planned behaviour that entails enduring psychological traits”. In comparison, Long et al. (2020) have identified volunteering as a relatively modest predictor of an individual’s subsequent hope. Correlations have been identified between individuals’ actions, attitudes, and hope levels, e.g., those with schizophrenia (Kukla et al., 2013).

Conservation volunteers are motivated to act through a variety of psychological and physical connections to the natural world, including a sense of community based on shared environmental values, nature connectedness and willingness to engage, positive childhood experiences of the natural world, opportunities to increase individual wellbeing, and, for some, career development (Ganzevoort & Van Den Born, 2020; Guiney, 2009; Heimann & Medvecky, 2022; Kragh, 2017; Shanahan, 2020; Sloane & Pröbstl-Haider, 2019; Woolley et al., 2021; Woosnam et al., 2019).

While motivations underlying volunteer actions for nature vary, common conservation attitudes may exist, including the importance of conserving nature, personal connection to nature, socialising with those with similar interests and improving areas that volunteers use for their recreation (Bruyere & Rappe, 2007; Ganzevoort & Van Den Born, 2020; Heimann & Medvecky, 2022; Ough Dealy et al., 2021). Conservation attitudes tend to be future-focused, for example, supporting future nature-based recreational and social activities through environmental conservation actions. Thus, anticipatory psychological traits, such as hope, may support a person's willingness to volunteer for conservation. Hope has been described variously as an emotion, a cognition, and an attitude (Ehrenfeld, 2009; Orr, 2004; Park et al., 2020). As defined in Snyder's Theory of Hope, hope is a cognitive-motivational process contributing to goal achievement by addressing barriers through agency and pathways thinking (Snyder, Harris, et al., 1991; Snyder et al., 2018). A hopeful individual approaches goal attainment by combining a belief in their ability to initiate and sustain actions (agency, i.e., willpower) with the knowledge and capability necessary to generate multiple means of overcoming barriers (pathways thinking, i.e., waypower) to reach their goals (Snyder, 2002; Snyder, Harris, et al., 1991). CLC biodiversity restoration actions are goal-directed. Consequently, hope's willpower and waypower constructs may influence current and future CLC biodiversity restoration behaviours.

Snyder's Hope Theory suggests two hope types, domain-specific (Dispositional) and domain-general (State). The former, domain-specific hope, where much of previous work on environmental action and hope has occurred, measures action and hope in relation to the environment or climate change mitigation behaviours (Geiger et al., 2019; Noblet & McCoy, 2018). State hope, in contrast, measures how hopeful participants feel in general, not about a specific area of concern (Chawla, 2020; Khalil et al., 2022). Biodiversity restoration entails non-trivial current and future-focussed problem-solving efforts (e.g., choosing appropriate planting areas, controlling weeds, preventing IAS reinvasions). These activities attract volunteers who are knowledgeable and practised in conservation efforts (Heimann & Medvecky, 2022; Peters et al., 2015), as well as those without prior experience (Beckwith et al., 2022). Thus, investigating general rather than specific hope may help determine the role of hope among the general population in terms of current conservation action and future conservation intention (Geiger et al., 2019; Ojala, 2017).

Snyder's State Hope Scale has been internationally validated across different socio-demographics and translated into numerous languages (Abdullah et al., 2018; Masjedi-Arani et al., 2020). Various hope-associated relationships providing personal and social benefits have been explored, including academic prowess (Rand et al., 2011; C. R. Snyder et al., 2002),

problem-solving (Chang, 1998), commitment to physical exercise (Anderson & Feldman, 2020; Curry & Snyder, 2000), childhood nature connection (Chawla, 2020), and climate change activism (Frumkin, 2022; Marlon et al., 2019; Ojala, 2012). Greater hope levels relate to adolescent environmental engagement, pro-environmental behaviours, and subjective well-being (Kerret et al., 2020; Ojala, 2012). The impact of hope has also been demonstrated through increased climate change education communications and climate action engagement (Bury et al., 2020; Geiger et al., 2019; Marlon et al., 2019). Other research supports associations between hope and future climate action intentions. For example, climate action intention among informal science learning centre visitors, persuasive climate change communication, environmental studies, cause-related future charity events and entrepreneurial intention (Bury et al., 2020; Chadwick, 2015; Chawla, 2020; Contreras et al., 2017; Geiger et al., 2021; Legg et al., 2021), as well as hope literature more broadly (Seligman et al., 2016; Snyder et al., 2018).

Hopeful thinking “necessitates both pathways and agency thought... they feed each other” (Snyder, 2002, p. 251). Snyder et al.’s (1996) Adult State Hope Scale (ASHS) is an instrument that measures Snyder’s cognitive model of hope on two subscales, (1) agency, which is energy directed towards goals, and (2) pathways, which is associated with planning to accomplish goals. These subscales are then combined to measure an individual level of hope. A review of hope literature indicates that agency and pathways thinking, while distinct constructs, are strongly correlated (Cheavens et al., 2006; Geiger et al., 2019). Previous work on environmental action has measured hope among those already engaged in environmental and climate change action (Ernst et al., 2017; Ogden, 2016). Some researchers have found that agency and pathways are two distinct but strongly correlated constructs related to an individual’s level of hope (Cheavens et al., 2006; Edwards et al., 2007; Snyder, Harris, et al., 1991). However, other research has found agency and pathways indistinct, with hope considered a single unidimensional construct (Khodarahimi, 2013; Metzler et al., 2022; Nel & Boshoff, 2014).

Other researchers have suggested that hope’s cognitive components (e.g., expectations, assumptions, anticipatory planning) may provide emotional buffering in adverse situations (Greenaway et al., 2016; Herth, 1992; Lazarus, 1999; Pleeging, Burger, et al., 2021). Van Zomeren et al.’s (2019) climate change action research expands this approach by proposing two hope-related coping functions: emotion-focused and problem-solving. Such functions appear to support the individual’s resilience in adverse situations. While biodiversity restoration is increasingly considered a vital aspect of climate change action (Pettorelli et al.,

2021), the relationships between hope, conservation attitudes, current conservation action, and future conservation intention in adults remain under-investigated (Ogden, 2016).

Within the Aotearoa New Zealand context, I explore hope's relation to conservation attitudes (thoughts framing current and future engagement related to the natural world), current conservation action, and future conservation intention. I hypothesise that 1. hope will positively correlate with conservation attitudes, 2. hope and conservation attitudes will relate to current conservation action, and 3. hope and conservation attitudes will associate with future conservation intention.

## 5.3 Method

### 5.3.1 Survey Design

A face-to-face digital survey was conducted at various public locations in the Bay of Islands, Aotearoa New Zealand, between December 2019 and February 2020. A convenience sample of every tenth adult (over 18 years) was invited to participate. Following any refusal to participate, the next tenth person was approached. This approach was conducted to limit potential response bias regarding families and social groups. Of the 246 Aotearoa New Zealand resident adults approached, 243 completed an 8-minute survey. The introductory description invited participants to complete a short survey to improve understanding of the relationships between hope, conservation attitudes, and conservation action. Specifically, the survey assessed participants' self-reported levels of hope, conservation attitudes, whether they currently undertook specific conservation actions (e.g., planting, weeding, or predator control), and whether they intended to undertake these actions in the future.

The survey incorporated six hope items from the Adult State Hope Scale (Snyder et al., 1996) (Appendix E). Three items assessed agency thinking (for example, "At this time, I am meeting the goals I have set for myself") and three pathways thinking (for example, "I can think of many ways to reach my current goals"). The survey also incorporated 12 conservation attitudes previously identified as relevant to how people think about the current-day and future environment in Aotearoa New Zealand (Ough Dealy et al., 2021). Hope and attitude items were measured using an 8-point Likert-type scale from "Definitely false" to "Definitely true". Participants indicated how much they agreed with twelve conservation attitude items (Ough Dealy et al., 2021) (Table 14) and their current self-reported conservation actions and future conservation intentions.

**Table 14***Conservation Attitude Items (Ough Dealy et al., 2021)*

---

Conservation attitude items	
1	I feel connected to the natural world
2	I feel connected to other people
3	The actions of the individual are important for the future of the natural world
4	The actions of groups are important for the future of the natural world
5	I am committed to looking after the natural world
6	Looking after the natural world takes effort
7	There is always more to learn about the natural world
8	I can help others learn about the natural world
9	I believe that nature will heal itself
10	I believe nature needs our help to heal
11	I believe that science and technology are important for finding solutions to future problems
12	I believe teamwork and collaboration are important for finding solutions to future problems

---

The conservation actions/intentions (e.g., planting, weeding, and predator control) were those most commonly associated with Aotearoa New Zealand CLC efforts (Peters et al., 2015). All three conservation actions/intentions were open to interpretation by the survey participants. Weeding, for example, could be in their own private garden or on public reserves as CLC group volunteers. Thus survey conservation action/intention questions recorded CLC-compatible participant behaviours. Participant socioeconomic information was also collected (Appendix F). This research was approved by the Auckland University of Technology Ethics Committee (AUTEK Reference number 18/406).

#### Data analysis

To evaluate the factorability of the Adult State Hope Scale (ASHS) questionnaire, Kaiser–Meyer–Olkin (KMO) and Bartlett’s test of sphericity (BTS) were conducted using Jamovi v2.3 (The jamovi project, 2021). The KMO value of 0.895 indicated suitable sample adequacy, and the BTS value was significant ( $\chi^2 = 763$ ;  $df = 15$ ;  $p < .001$ ), evidencing appropriateness for Exploratory Factor Analysis (EFA). Construct validity of the instrument was explored via EFA (Extraction = Maximum Likelihood; Rotation = Oblimin) with Horn’s parallel analysis, using Jamovi; a unidimensional structure was solved. Confirmatory Factor Analysis was conducted in Jamovi to verify this dimensionality, adopting root mean square error of approximation

(RMSEA) and comparative fit index (CFI) as measures of model fit (one-factor model: RMSEA = 0.08, CFI = 0.98; two-factor model: RMSEA = 0.09, CFI = 0.98). The agency and pathways thinking scores were thus combined in the current study as a single construct of hope. The internal consistency of the ASHS items in an Aotearoa New Zealand context was evaluated using Cronbach's alpha coefficient, which indicated good reliability ( $\alpha = .96$ ).

Non-parametric Spearman's rank correlation determined the relationships and effect sizes among participants' hope levels and conservation attitudes. Correlations were considered statistically significant at  $p < .05$ . Principal Component Analysis (PCA) enabled visual assessment of the major sources of variation in participant responses. PCA uses the correlation matrix of the variables as input and then reduces a high number of interrelated variables into a smaller set of linearly uncorrelated variables while preserving as much variance as possible in the original dataset (Jaadi, 2019; Ngo, 2018b; Richardson, 2009; Shlens, 2005). Projection of the data matrix onto a lower-dimensional space can help understand the correlation structure among the original variables and discern trends and patterns in the data. Non-parametric Mann-Whitney tests determined whether differences in participants' hope and conservation attitudes are associated with current conservation actions and future conservation intentions (i.e., planting, weeding, and predator control). The independent variables were binary-coded actions; the dependent variables were the Likert scale attitudes. Fisher's exact tests of independence examined the relationships between current conservation action and future conservation intention. Unless stated otherwise, data were analysed with XLSTAT v2020.5.1 (Addinsoft, 2020).

## 5.4 Results

Based on the analysis of this study's particular data, a unidimensional construct of hope, combining agency and pathways thinking, was established. Hope was positively correlated with all but one of the conservation attitudes investigated, sharing between a third and two-thirds of their variance (Table 15). The remaining conservation attitude item, "I believe that nature will heal itself", was negatively correlated with hope ( $r_s = -0.326$ ,  $p < .001$ ) (Table 15). The sole conservation attitude item that did not correlate with hope related to a person's belief that they can help others learn about the natural world ( $r_s = 0.155$ ,  $p < .05$ ).

**Table 15***Spearman Rank Correlations ( $r_s$ ) among Hope and Conservation Attitudes.*

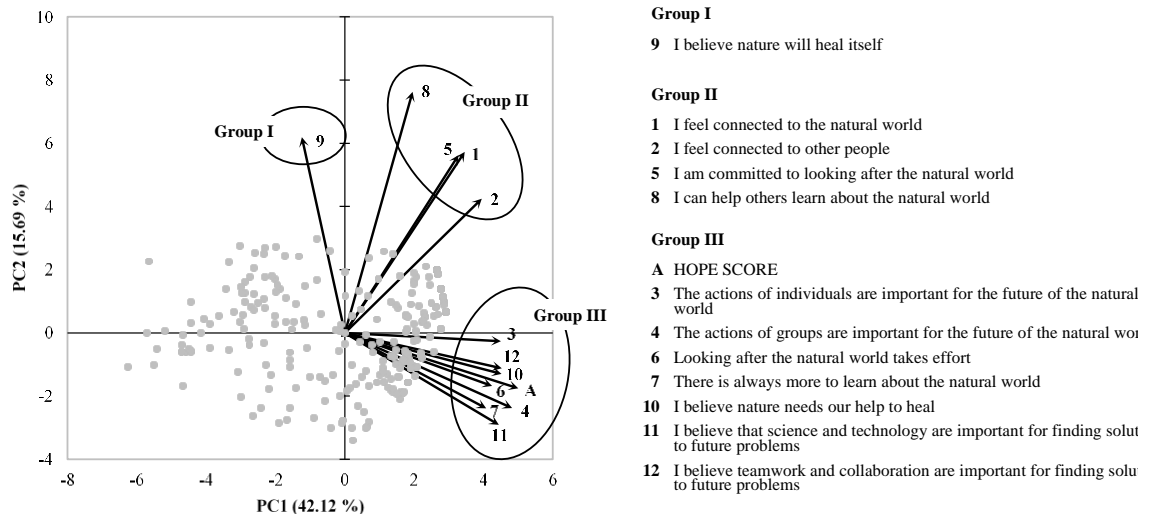
Participant response variables		A	B	C	1	2	3	4	5	6	7	8	9	10	11
Hope	A Hope score (Agency + Pathway)	–													
	B Agency score	0.97***	–												
	C Pathway Score	0.96***	0.88***	–											
Conservation attitudes	1 I feel connected to the natural world	0.33***	0.33***	0.34***	–										
	2 I feel connected to other people	0.49***	0.47***	0.50***	0.50***	–									
	3 The actions of individuals are important for the future of the natural world	0.54***	0.52***	0.52***	0.32***	0.35***	–								
	4 The actions of groups are important for the future of the natural world	0.59***	0.59***	0.56***	0.33***	0.36***	0.61***	–							
	5 I am committed to looking after the natural world	0.34***	0.34***	0.31***	0.52***	0.51***	0.39***	0.31***	–						
	6 Looking after the natural world takes effort	0.51***	0.51***	0.49***	0.27***	0.34***	0.40***	0.49***	0.24***	–					
	7 There is always more to learn about the natural world	0.54***	0.51***	0.52***	0.24***	0.23***	0.49***	0.54***	0.22***	0.54***	–				
	8 I can help others learn about the natural world	0.15*	0.16*	0.15*	0.47***	0.45***	0.21**	0.01	0.52***	0.08	0.06	–			
	9 I believe that nature will heal itself	-0.33***	-0.33***	-0.30***	0.14*	0.03	-0.11	-0.21**	0.14*	-0.11	-0.16*	0.24***	–		
	10 I believe nature needs our help to heal	0.55***	0.55***	0.53***	0.25***	0.42***	0.44***	0.57***	0.32***	0.50***	0.39***	0.18**	-0.23***	–	
	11 I believe that science and technology are important for finding solutions to future problems	0.62***	0.59***	0.61***	0.19**	0.36***	0.48***	0.62***	0.28***	0.42***	0.44***	0.01	-0.26***	0.56***	–
	12 I believe teamwork and collaboration are important for finding solutions to future problems	0.57***	0.56***	0.52***	0.30***	0.38***	0.51***	0.53***	0.29***	0.57***	0.44***	0.16*	-0.15*	0.50***	0.48***

Note. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

Principal component analysis of the hope and attitude data revealed how participants clustered based on the similarity/dissimilarity of their responses to the survey questions (Figure 41).

**Figure 41**

*Biplot of the Principal Components Analysis (PC1 vs PC2) Describing Variation in the Scores and Relationships between Loadings (i.e. participants' hope and conservation attitudes)*



The first two principal components captured 57.81% of the variation, and the overlaid loadings uncovered three natural groupings (represented by manually input indicative ellipses) based on the underlying correlation structure (Figure 41). Group I consisted of a single attitude, “nature will heal itself”, and stood apart from Groups II and III. The greater than 90° angle between this attitude and those in Group III (including the hope score and “nature needs our help to heal”) indicates negative associations (Ngo, 2018a). Group II attitudes that shared correlation structure comprised those associated with commitment and connection to the natural world and other people and helping others learn about the natural world. Group II attitudes appeared to have limited association with the hope score.

Group III loadings were primarily responsible for the scores’ variation and positively associated attitudes involving ongoing learning, scientific and technological approaches, and individual action. Attitudes closely associated with the hope score were teamwork and collaboration, nature needing our help, the belief that such help is effortful, and the importance of group action for the future of the natural world. The conservation attitude “Looking after the natural world takes effort” has the highest loading (5.01).

Relationships between participants’ current or intended conservation involvement with their hope scores and conservation attitudes were assessed (Table 16). Hope scores were similar

between those who do current conservation actions and those who do not currently perform a conservation action (Mann-Whitney U tests;  $p$ -values  $> .05$ ). Hope scores were similar for those current conservation actions and those not currently performing a conservation action (Mann-Whitney U tests;  $p$ -values  $> .05$ ). However, those who currently plant, weed, or control predators generally had more positive attitudes towards connection with other people, connection and commitment to the natural world, and helping others learn (Mann-Whitney U tests;  $p$ -values  $< .05$ ).

In contrast, respondents with conservation intentions had higher hope scores on average than those without such goals (Mann-Whitney U tests;  $p$ -values  $< .001$ ) (Table 16). Furthermore, those with intent to act generally had more positive attitudes across almost all attitude items (Mann-Whitney U tests;  $p$ -values  $< .05$ ) (Table 16). Interestingly, regardless of participants' current conservation actions or future conservation intentions, the belief that "nature will heal itself" received the lowest survey-wide score.

**Table 16**

*Comparisons of Participant Hope Metric and Conservation Attitudes based on Self-reported Current Conservation Actions and Future Conservation Intentions Regarding Planting, Weeding, and Predator Control. Data Represent Group Means ( $\pm$ SD) with the Corresponding p-value (Mann–Whitney U tests) Centred Below Each Pair.*

Participant response variables		Planting				Weeding				Predator control			
		Current		Intended		Current		Intended		Current		Intended	
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Hope	Hope	37.5 (6.7)	37.7 (8.9)	42.2 (7.0)	36.3 (9.3)	37.7 (7.2)	37.9 (8.9)	42.4 (6.8)	36.3 (9.3)	40.9 (7.3)	39.4 (8.6)	42.5 (6.5)	38.3 (8.8)
		$p = 0.529$		$p = <0.0001$		$p = 0.588$		$p = <0.0001$		$p = <0.0001$		$p = 0.001$	
	I feel connected to the natural world	6.8 (1.3)	6.1 (1.3)	7.1 (1.1)	5.8 (1.2)	6.8 (1.3)	6.1 (1.3)	7.2 (1.0)	5.7 (1.3)	7.1 (1.0)	6.4 (1.3)	7.4 (0.9)	6.2 (1.3)
	$p = <0.0001$		$p = <0.0001$		$p = 0.002$		$p = <0.0001$		$p = <0.0001$		$p = <0.0001$		
	I feel connected to other people	6.4 (1.6)	5.7 (1.8)	6.8 (1.2)	5.3 (1.8)	6.3 (1.6)	5.6 (1.7)	6.9 (1.2)	5.2 (1.8)	6.7 (1.2)	6.1 (1.6)	7.0 (1.2)	5.9 (1.7)
	$p = 0.040$		$p = <0.0001$		$p = 0.027$		$p = <0.0001$		$p = <0.0001$		$p = <0.0001$		
Conservation attitudes	The actions of the individual are important for the future of the natural world	7.0 (1.7)	6.9 (1.6)	7.5 (1.1)	6.3 (1.9)	7.0 (1.7)	6.8 (1.6)	7.5 (1.1)	6.5 (1.8)	7.2 (1.5)	7.2 (1.4)	7.5 (1.1)	6.9 (1.6)
		$p = 0.442$		$p = <0.0001$		$p = 0.433$		$p = <0.0001$		$p = <0.0001$		$p = 0.0003$	
	The actions of groups are important for the future of the natural world	6.9 (1.5)	6.7 (1.9)	7.4 (1.3)	6.1 (2.0)	7.0 (1.4)	6.6 (1.9)	7.5 (1.2)	6.2 (2.0)	7.3 (1.1)	6.9 (1.8)	7.5 (1.2)	6.7 (1.8)
		$p = 0.887$		$p = <0.0001$		$p = 0.301$		$p = <0.0001$		$p = <0.0001$		$p = <0.0001$	
	I am committed to looking after the natural world	6.4 (2.0)	5.8 (1.5)	6.9 (1.4)	5.8 (1.3)	6.6 (1.7)	5.7 (1.6)	7.0 (1.4)	5.8 (1.5)	7.0 (1.3)	6.1 (1.5)	7.1 (1.4)	6.2 (1.4)
	$p = 0.013$		$p = <0.0001$		$p = 0.001$		$p = <0.0001$		$p = <0.0001$		$p = <0.0001$		

Participant response variables	Planting				Weeding				Predator control			
	Current		Intended		Current		Intended		Current		Intended	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Looking after the natural world takes effort	7.1 (1.5) $p = 0.842$	7.1 (1.4)	7.7 (0.8) $p = <0.0002$	6.8 (1.8)	7.2 (1.4) $p = 0.815$	7.2 (1.4)	7.7 (0.8) $p = <0.0001$	6.9 (1.7)	7.4 (1.3) $p = <0.0001$	7.3 (1.3)	7.7 (0.8) $p = 0.006$	7.2 (1.5)
There is always more to learn about the natural world	7.4 (1.3) $p = 0.567$	7.1 (1.5)	7.7 (0.7) $p = <0.0001$	6.7 (1.9)	7.4 (1.2) $p = 0.438$	7.2 (1.4)	7.7 (0.7) $p = <0.0001$	6.8 (1.8)	7.5 (1.2) $p = <0.0001$	7.4 (1.2)	7.8 (0.7) $p = 0.0005$	7.2 (1.5)
I can help others learn about the natural world	6.9 (1.4) $p = <0.0001$	5.3 (2.0)	6.8 (1.3) $p = <0.0001$	5.1 (2.1)	6.7 (1.4) $p = <0.0001$	5.3 (2.0)	7.0 (1.1) $p = <0.0001$	5.0 (2.1)	7.0 (1.1) $p = <0.0001$	6.0 (1.6)	7.1 (1.2) $p = <0.0001$	5.8 (1.9)
I believe that nature will heal itself	5.5 (1.9) $p = <0.0001$	3.6 (2.3)	4.4 (2.2) $p = 0.065$	3.6 (2.3)	5.5 (1.8) $p = <0.0001$	3.5 (2.2)	4.4 (2.2) $p = 0.043$	3.6 (2.3)	4.8 (2.1) $p = 0.043$	3.8 (2.2)	4.7 (2.2) $p = 0.006$	3.8 (2.3)
I believe nature needs our help to heal	6.7 (1.8) $p = 0.789$	6.8 (1.8)	7.5 (1.2) $p = <0.0001$	6.3 (1.9)	6.9 (1.5) $p = 0.793$	6.8 (1.8)	7.5 (1.1) $p = <0.0001$	6.4 (2.0)	7.5 (1.0) $p = <0.0001$	7.0 (1.6)	7.5 (1.2) $p = 0.001$	6.9 (1.3)
I believe that science and technology are important for finding solutions to future problems	6.7 (1.3) $p = 0.332$	6.9 (1.3)	7.4 (1.1) $p = <0.0001$	6.6 (1.4)	6.8 (1.3) $p = 0.792$	6.9 (1.3)	7.4 (1.1) $p = <0.0002$	6.7 (1.4)	7.2 (1.2) $p = <0.0002$	7.1 (1.2)	7.4 (1.2) $p = 0.013$	7.0 (1.3)
I believe teamwork and collaboration are important for finding solutions to future problems	7.1 (1.3) $p = 0.484$	6.8 (1.5)	7.5 (1.0) $p = <0.0001$	6.6 (1.4)	7.1 (1.3) $p = 0.310$	6.8 (1.4)	7.6 (1.4) $p = <0.0001$	6.7 (1.4)	7.5 (1.0) $p = <0.0001$	7.1 (1.3)	7.6 (1.1) $p = 0.001$	7.0 (1.3)

Conservation attitudes

Fisher's exact tests of independence were performed on a series of 2x2 contingency tables (Table 17) to examine pairwise relationships between current conservation actions (planting, weeding, predator control) and the future intention to act within these areas. Relationships between all variables were significant (Fisher's  $p$ -values < .001), demonstrating that people who currently undertake conservation actions also intend to undertake conservation actions in the future.

**Table 17**

*Cross-tabulation of Current Conservation Actions (Planting, Weeding, and Predator Control) and Future Conservation Intentions (Planting, Weeding, and Predator Control)*

			Future Conservation Intention					
			Planting		Weeding		Predator Control	
			Yes	No	Yes	No	Yes	No
Current Conservation Action	Planting	Yes	42	1	40	3	33	7
		No	9	35	9	37	7	40
	Weeding	Yes	52	1	52	2	39	13
		No	16	35	11	41	7	44
	Predator Control	Yes	59	1	60	2	55	5
		No	58	35	50	41	13	74

Note. Fisher's  $p$ -values < .001 for all pairwise comparisons

While around 49% of respondents currently undertake planting activities, 59% stated they intend to plant in the future (Table 17). Similarly, 51% of respondents currently weed, while 60% intend to weed in the future, 41% of respondents currently undertake predator control, and 46% intend to do so. These findings suggest that respondents intend to undertake more conservation actions in the future than they are currently undertaking.

Approximately 8–10% of respondents who do not currently plant intend to plant, weed, or control predators in the future. Of those who do not currently weed, 10% intend to weed in the future, 15% intend to plant, and 9% intend to control predators. Of those who do not currently control predators, only 9% intend to control predators in the future, while 38% intend to plant and 33% intend to weed.

## 5.5 Discussion

I intended to understand whether hope and conservation attitudes relate to specific goal-directed biodiversity restoration behaviours as current conservation actions or future

conservation intentions. The research was situated at a single time point, thus providing a snapshot of correlations within a population of actual and potential biodiversity restoration volunteers at the between-person level. This research was a preliminary approach to understanding these potentially complex relationships. Future conservation intentions were shown to relate to hope and several conservation attitudes. Current conservation actions related to a subset of conservation attitudes but not to hope. Associations between current conservation actions and future conservation intentions were also observed.

### 5.5.1 Hope

Snyder's Theory of Hope proposes a multi-dimensional construct (Edwards et al., 2007; Snyder, Harris, et al., 1991). However, Babyak et al. (1993) suggest that the total hope score, while consisting of two constructs (agency and pathways), has a single underlying latent variable (Edwards et al., 2007, p. 91). Other researchers have also found that hope is unidimensional (Khodarahimi, 2013; Metzler et al., 2022; Nel & Boshoff, 2014) as in this study. The findings suggest that this research should integrate hope as a single construct.

### 5.5.2 Hope and Conservation Attitudes

The research results supported my hypothesis that hope positively correlates with conservation attitudes. Hope had a positive correlation with eleven of twelve separate conservation attitudes tested: valuing individual and group action, the role of teamwork and collaboration, connecting to others, the desire to learn more while also helping others learn, connecting with others and the natural world, nature needing our help, and such action taking effort. Dutch conservation volunteers expressed similar conservation attitude relationships (contributing to nature conservation, being connected to and learning more about nature, and working with others) as important motivational factors for action (Ganzevoort & Van Den Born, 2020).

Snyder's Theory of Hope describes a hopeful person as approaching goal achievement through willpower and waypower (Snyder, 2002; Snyder, Harris, et al., 1991). Hope also appears related to a person's willingness to get involved in climate action (Bury et al., 2020; Geiger et al., 2021; Marlon et al., 2019). In the current study, hope negatively correlates with the twelfth attitude, "I believe nature will heal itself". One interpretation that human intervention is necessary for nature to heal is possible, particularly in light of the positively correlated attitude, "nature needs our help". This interpretation may relate to hope's agentic and goal-related aspects. This future-focused attitude may also support those who intend to become active in future conservation activities.

The participants' individual attitudinal responses (Figure 41) were grouped differently regarding hope. As previously noted, hope was negatively associated with the attitude that "nature will heal itself" (Group I). While this may imply an attitude that nature cannot heal on its own, the current research did not define the source nor type of assistance needed to facilitate such healing. However, hope and "nature needs our help" were strongly related (cf Group III), suggesting that nature may need human intervention. Group II appears to have a limited association with hope. This attitude grouping appears to be more at the individual participant level, associating personal connection with the natural world, to other people, commitment to looking after nature, and helping others do likewise. The third attitude grouping related positively to hope and is strongly future-focused, positive, and action-based. This grouping associated practical strategies aligned with caring for the world (e.g., working and collaborating individually and with others, recognising the effort involved, science and technological solutions, and the need for continual learning). Attitudinal groupings II and III suggest two separate but linked strategies for engendering general public engagement with the natural world, 1. developing individual nature connectedness (Group II) (Hoover, 2020; Zylstra et al., 2014) and 2. promoting practical strategies that help people move beyond connectedness and commitment to action (Group III) (Alcock et al., 2020; Hoover, 2020).

### 5.5.3 Hope, Conservation Attitudes, and Future Conservation Intention

I hypothesised that hope and conservation attitudes would associate with future conservation intention. The current research showed strong correlations between hope and future conservation intention for all biodiversity restoration behaviours tested. These results support Snyder's conception of hope as future focused. Furthermore, participants reported similar responses to hope in relation to conservation attitudes. Hopefulness appears to be a necessary prerequisite to the future intention of supporting biodiversity restoration goals (Peters et al., 2015; Russell & Stanley, 2018; Weidlich et al., 2020). Furthermore, this study's hope and conservation intention results are supported by associations reported by Bury et al. (2020); Chadwick (2015); Geiger et al. (2021) between hope and future climate action intention.

Eleven of the 12 conservation attitudes correlated positively with those intending to plant, weed or control predators. These attitudes are similar to those expressed by environmental stewardship volunteers, e.g., helping the environment and ongoing learning (Ryan et al., 2001). However, the twelfth attitude in the current study, "I believe nature will heal itself", as with hope and conservation attitudes, correlated negatively with biodiversity restoration intentions. Conservation effort intentions may align more with the belief that nature needs external assistance to heal. Enabling potential conservation volunteers to provide such external

assistance may entail closer matches between volunteer motivations and participation (Ryan et al., 2001).

Interactions between conservation attitudes and intention to act for the natural world are complex. In my research, this relationship, while significant, is of low effect. Other research, including Portuguese birdwatchers funding environmental improvements, indicates that pro-environmental attitudes do not translate readily into pro-environmental behavioural intentions (Pintassilgo et al., 2021). In Australia, the predicted likelihood of koala-beneficial native vegetation restoration appears to be influenced by positive attitudes towards koalas and perceptions that value others also protect this specie (Fielding et al., 2022). While Gillis and Swim's (2020) research investigating predictive native planting behaviours among American householders advocates a more nuanced understanding and contextualisation of the relationship between goal-based attitudes and resultant behaviours.

#### 5.5.4 Hope, Conservation Attitudes, and Current Conservation Action

Hope has been promoted as necessary for conservation action (Hance, 2016; Kretz, 2013; Krupnick & Knowlton, 2017; Orr, 2007). Conservation attitudes are also associated with conservation action (Bruyere & Rappe, 2007; Heimann & Medvecky, 2022). I hypothesised that hope and conservation attitudes would relate to current conservation action

However, hope did not relate to current conservation action in the current research. One possibility for this unexpected result may be the relationship between time perspectives, a person's experiences and conceptions of past, present, and future time, with pro-environmental behaviours. In a meta-analysis of more than 6300 participants from seven countries, future time perspective and pro-environmental behaviour relationships were "strong and nontrivial". In contrast, near-term (current) time perspectives had a "significant but trivial effect" on pro-environmental behaviours (Milfont et al., 2012, p. 330). The relationship between hope and pro-environmental behaviour temporality (current and future) would benefit from further exploration.

While hope was not related to current conservation action, positive correlations emerged between such action and four of the twelve conservation attitudes (i.e., commitment and connection to nature, connection to other people, and a desire to teach others about the natural world). These attitudes may be similar to the positive connectedness to nature found in pro-environmental attitudes and conservation volunteering research (Guiney, 2009; Hoover, 2020), the influence of the environment on volunteer participation frequency (Asah & Blahna, 2013), social and environmental value orientations (Ackermann et al., 2014).

### 5.5.5 Hope, Conservation Attitudes, Current Conservation Action and Future Conservation Intention

My study identifies links between the current hope state and future conservation intention. Long et al. (2020) identified volunteering as predicting an individual's subsequent hope. CLC volunteering may thus support future participant hopefulness. CLC groups could benefit from hope's role in future conservation intention by increasing success-oriented behaviour by partnering with school-based programmes that foster hope development (Çam et al., 2020; Dixson, 2019; Ojala, 2017). Hope-increasing interventions employing success-related behaviours could support biodiversity restoration solutions (Blair, 2008; Dixson, 2017; Dixson, 2019; Kidman & Chang, 2021). This strategy could also inform community-based adult education programmes that might develop into active reciprocal partnerships between educators, students, the as-yet-unengaged public, current conservation volunteers, and those with future conservation intentions through real-life experiences and expertise development (Blair, 2008; Broom, 2017; Dada et al., 2017; Wong et al., 2020). Such programmes might enable participants to express various conservation attitudes, including emotional commitment and connection with the natural world and each other, and engage potential volunteers in experiences that may move their future conservation intention into current conservation action (Chawla, 2020; Eames & Mardon, 2020; Efrat & Plunkett Scott, 2020; Project Island Song, n.d.-a; Woosnam et al., 2019).

CLC programme funders and group leaders could consider a two-pronged complementary approach that retains existing volunteers while encouraging the future conservation intentions of inactive ones. Initiatives could emphasise and enhance conservation attitudes such as connection to others through social group activities, connection and commitment to nature, and teaching others by direct association with the conservation activity (Asah & Blahna, 2013; Grimm & Needham, 2012; Guiney, 2009; Kilmartin, 2021; Liarakou et al., 2011; Ryan et al., 2001).

Practical CLC volunteer engagement entry points are needed. Conservation-based activities attended by friends or family of the unengaged may build on the social connectedness of these natural world learning opportunities (Broom, 2017; Heimann & Medvecky, 2022; Ives et al., 2017; Sandifer et al., 2015). Consequently, I recommend that CLC and government agencies adopt a more holistic approach to conservation activities by developing activities that strengthen human-nature connections, such as connecting and collaborating with, then learning from, each other across different conservation opportunities (Durr & Fischer, 2018). Visibility of such cross-functional activities may further entice the as-yet unengaged public to imitate these conservation behaviours (Babutsidze & Chai, 2018).

This research indicated that current planters, weeders, and predator controllers most often intend future involvement in their chosen activities. These results partly support Volunteering New Zealand (2020) survey results, where 82.3% of volunteers have a long-term commitment to their current volunteering role. My results also suggest that participants intend to undertake more conservation actions in the future than they do currently. Those currently planting and weeding intend planting and weeding in the future, but around ten per cent of those currently planting or weeding did not intend controlling predators. While the proportion of respondents currently controlling predators was lower than those currently planting or weeding, participants currently controlling predators demonstrated similar intentions around predator control, planting, or weeding in the future. Conservation programmes promoting a wholistic approach to biodiversity restoration may support volunteers to undertake actions of interest and introduce them to other actions they may not have been aware. My study has thus highlighted some potential roles of hope and conservation attitudes on current conservation action and future conservation intention.

A convenience sample of the Aotearoa New Zealand adult public was utilised as a cost- and time-effective sampling method suitable for the exploratory nature of this research. However, I recognise that research findings based on a convenience sample cannot be generalised to a broader national or international population (Fife-Schaw, 2006; Hewson et al., 2016). Thus, this research should be repeated with a representative sample in Aotearoa New Zealand and different countries worldwide. Furthermore, participant self-reporting may not accurately reflect current conservation action or future conservation intention; thus, further research comparing self-reporting with behavioural outcomes is necessary (Kormos & Gifford, 2014; Nilsson et al., 2020). A repeated-measure study could investigate the stability of these results over time while addressing the current study's single timepoint design limitations (cf Geiger et al., 2019).

Despite these limitations, Snyder's Adult State Hope Scale identified correlations between hope, conservation attitudes, and future conservation intention. One area for further exploration is the stepwise pathway of these associations. For example, volunteers may connect with each other and then to the natural world before committing to the natural world through conservation actions.

The relative influence of hope or conservation attitudes on conservation actions or intention to act is also unclear. Some conservation attitudes might have a greater influence on an individual's hope levels; high-hope people, for example, may be predisposed to espouse certain conservation attitudes. Furthermore, the current research did not identify hope nor

conservation attitude directionality associated with initiating and sustaining biodiversity restoration behaviour. A hopeful CLC volunteer, for example, may utilise their hopefulness to address biodiversity restoration barriers (e.g., learning and applying various predator control measures). Others may be motivated to act due to their attitude that nature needs help. A more nuanced understanding of the multi-directional relationships between conservation attitudes and hope may help explain the motivations for enhancing future conservation intention. Future research could also untangle whether certain conservation attitudes underpin current conservation action, whether action enhances conservation attitudes, or whether each might reinforce the other.

An unanswered question remains over the other motivational states or attributes, situations or normative influences that may also contribute to an individual's current conservation action or future intention to act (Fielding et al., 2022; Gillis & Swim, 2020; Schrank et al., 2008). Consequently, future research could explore these relationships in more depth.

The current research proposes changes to CLC and government agency programmes, project design, communications, conservation education, practice, and policy. However, further work is needed to understand the complex and multi-faceted relationships between hope, conservation attitudes, current conservation action, and future conservation intention. Nevertheless, this study provided important insights into the positive relationship between those currently active in conservation, highlighting their commitment and connectedness to the natural world, connectedness to other people, and desire to teach others about the natural world. Furthermore, the relationship between hope and future conservation intention may contribute to biodiversity restoration.

## 5.6 Conclusion

Community-led conservation is one vital component that addresses global biodiversity and ecosystem degradation. Understanding the relationships between hope, volunteer conservation attitudes, current conservation action, and future conservation intention is critical to supporting and delivering positive, sustainable outcomes for CLC and long-term biodiversity restoration. The current research provides important insights for those concerned with encouraging current conservation action and future conservation intention. This study suggests that those who currently carry out conservation actions intend to do so in the future. They are hopeful and express this cognitive approach through problem-solving intentions. Attitudes of commitment and connection to the natural world, connection to others, and teaching others about nature are also related to current conservation action and future conservation intention. I suggest enhancing current conservation volunteering by

incorporating these attitudes into CLC communication, engagement, school- and community-based environmental education, and project design. Future conservation intention could benefit from fostering hope-related thinking. Such mechanisms could enhance current conservation action and future conservation intention, thus supporting greater delivery of positive biodiversity restoration through increased CLC volunteering.

In **Chapter 6**, I develop practical applications, based on my research, to help address the knowledge-action gap.

## Chapter 6 General Discussion and Conclusions – Bridging the Knowledge-Action Gap

*World in the Present-day*



*Note.* By 8non004, 2019, collage, mixed media.

*World in the Future*



*Note.* By 8non004, 2019, collage, mixed media.

## 6.1 The Knowledge-Action Gap

Academic research provides valuable findings and generates future associated research. However, if solely published in academic journals, such research outputs may not contribute to, for example, biodiversity protective or restorative actions in the world beyond academia. Roche et al. (2021) suggest three reasons for this “knowledge-action gap”, 1. availability, 2. interpretability, and 3. useability. Conservation practitioners may experience difficulty accessing research findings behind journal paywalls. They may also have insufficient scientific literature search, reading, interpretation, and application skills and resources (e.g., time and budget) to develop evidence-based applications such as policy and practice (Downey et al., 2022; James et al., 2001). It is, therefore, incumbent on the researcher to provide non-academic audiences access to evidence-based policy and practice customised to their requirements (Downey et al., 2022; Jensen et al., 2023).

Biodiversity restoration involves practical approaches that enable volunteers, build capacity, and help set goals (Sutherland, 2022). Retaining relevant CLC volunteering information and strategies within academia may result, at best, in wasted effort and funding and, at worst, reduce CLC conservation goal achievement (e.g., a predator-free Aotearoa New Zealand) (Downey et al., 2022). While CLC groups apply research-derived best practice predator control (Bissell, 2022; Department of Conservation, 2019d), understanding then utilising conservation attitudes, hope, and practical conservation action has been under-researched and thus under-employed. *Furthermore, unless conservation attitude and hope research findings are deliberately made accessible to CLC groups, they may remain of academic interest only.* Thus **Chapter 6** offers practical ‘customised’ applications of the new scientific knowledge contributions presented in this thesis.

## 6.2 Summary of Research Contributions

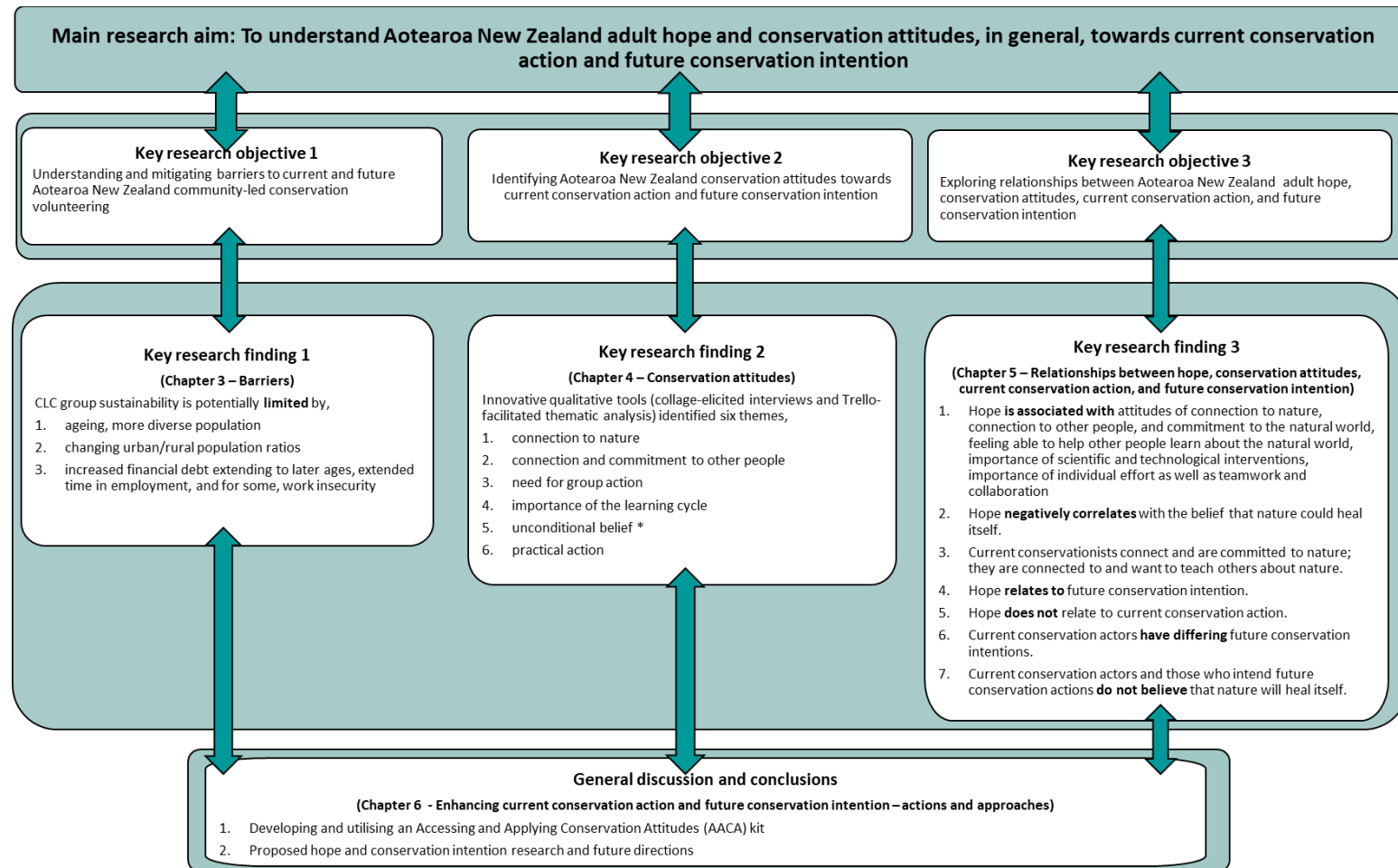
This thesis has presented new contributions to scientific knowledge of likely reduced conservation volunteer availability by 2050. Recruitment of younger volunteers is uncertain: consequently, maintaining current conservation achievements (e.g., predator control, planting, and weeding) and initiating future such actions may not be supported. Thus, a better understanding of what motivates current conservation volunteers and those with future conservation intentions is necessary. Attitudes are a key motivational factor underlying action. Hope also motivates future action. Consequently, investigating individuals’ conservation attitudes and hope may support current conservation action and future conservation intention (Figure 42).

In **Chapter 2**, I identified that hope and conservation attitudes, as possible motivators of current conservation action and future conservation intention, have been under-researched. In **Chapter 3**, my analysis of current and projected Aotearoa New Zealand demographic and attitudinal data (Ough Dealy et al., 2022) identified three considerable barriers to CLC volunteering, 1. ***an ageing population***, 2. ***rural populations moving to urban areas***, and 3, ***financial*** constraints (Figure 42). Such analysis suggests future volunteer availability uncertainty. Despite such uncertainty, the general Aotearoa New Zealand population is a potential source of current and future conservation volunteers. Volunteers are variously motivated to act for conservation (Ganzevoort & Van Den Born, 2020; Heimann & Medvecky, 2022; MacDonald & Staats, 2022). In **Chapter 4**, I developed an innovative thematic analysis tool based on collage-based interviews to elicit one such conservation motivator, conservation attitudes (Ough Dealy et al., 2021). Six conservation attitudes were determined, 1. ***commitment and connection to the natural world***, 2. ***connectivity to others***, 3. ***group action***, 4. ***the learning cycle***, 5. ***practical solutions***, and 6. ***unconditional belief*** (in science, technology, or faith) (Figure 42). Aotearoa New Zealand and international literature report similar conservation attitudes (Ganzevoort & Van Den Born, 2020; Heimann & Medvecky, 2022; Pike et al., 2020; Sockhill et al., 2022; Zylstra et al., 2014).

**Hope, a factor in volunteer engagement, retention, and intention to act**, has been explored in the health, educational, and climate action areas (Geiger et al., 2021; Legg et al., 2021; Ojala, 2012). However, hope and conservation attitudes as motivators of current conservation action or intention to act have not been investigated. In **Chapter 5**, I developed and utilised a digital intercept survey of Aotearoa New Zealand adults; this survey revealed complex relationships between ***adult state hope*** (Snyder et al., 1996), ***conservation attitudes***, ***current conservation action***, and ***future conservation intention*** (Figure 42). **Hope**, for example, **is related to future conservation intention** but **not current conservation action** (Ough Dealy et al., Under review).

**Figure 42**

*Conceptual Diagram of Thesis Main Research Aim, Key Research Objectives, Key Research Findings, and Proposed Research and Future Directions*



Note. \*In science/technology and or faith to resolve conservation issues.

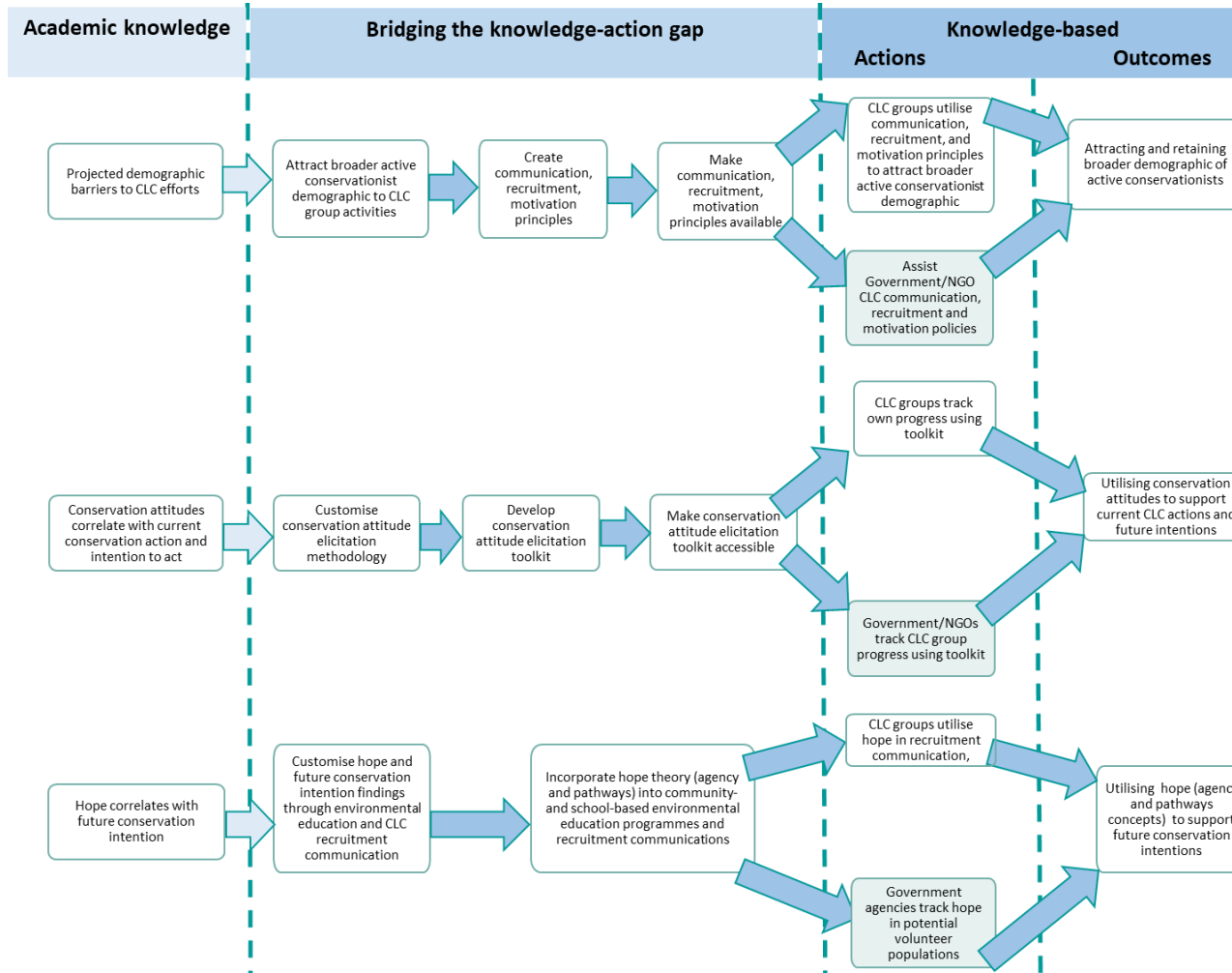
### 6.3 From Academic Knowledge to CLC Volunteer Practice

My research identified three areas impacting CLC volunteering, 1. projected demographics, 2. interactions between conservation attitudes and current conservation actions and future conservation intentions, and 3. hope and current conservation actions and future conservation intentions. This section proposes practical approaches that link my research to supporting current CLC biodiversity restoration actions and future intentions.

In **Chapter 6**, I now address the academic knowledge practical CLC action gap by making my findings more directly available, interpretable, and useable by CLC groups, conservation-related government agencies, and NGOs. This approach supports the current conservation actions and future conservation intentions necessary for a predator-free Aotearoa New Zealand. The main areas addressed with evidence-based applications are 1. attracting a broader 'active conservationist' demographic to CLC group activities, 2. improving CLC group activity effectiveness, and 3. assisting conservation-related Government agencies and NGOs to apply appropriate policies and practices. Specifically, I describe three applications, 1. communication, recruitment, and motivation principles; 2. conservation attitude toolkits for conservation-related Government and NGO agencies and CLC groups; and 3. utilising hope within environmental education programmes (Figure 43).

**Figure 43**

*Bridging the Knowledge-action Gap. Informing Volunteer CLC Practice and Government/NGO Policy and Practice*



### 6.3.1 Mitigating Demographic Barriers to Conservation Volunteering

Aotearoa New Zealand demographic projections identify potential barriers to future CLC volunteering, including an ageing population with associated financial and time pressures and rural-to-urban centre population drift (Ough Dealy et al., 2022; Peters et al., 2015). CLC groups, local and national governments, and NGO-led practices can address these barriers (Table 18).

**Table 18**

*Demographic Projections May Influence Current Conservation Actions and Future Conservation Intentions: Key Research Findings, Actions, and Specific Approaches*

<b>Key Research Findings</b>	<b>Actions</b>	<b>Specific Approaches</b>
Demographic projections may impact future CLC operations, e.g., ageing population, rural to urban population shift, CLC project accessibility, volunteer availability and volunteering costs	1. Address demographic barriers to current conservation action and future conservation intentions at the local CLC group level	National and regional conservation agencies should fund sustainable CLC group networks, supporting conservation skill development, best practice, and experience sharing. National and regional conservation agencies and local CLC groups incorporate communication and engagement approaches that increase engagement of a more diverse demographic (e.g., age, gender, ethnicity, language, religion, culture).
	2. Active elimination of economic barriers to CLC participation	National government agencies should develop targeted conservation-volunteering-related tax incentives and expense allowances.
	3. Strengthen urban/rural volunteering	Collaboration between regional, city, and local councils and CLC groups at place enabling urban volunteers to support rural CLC projects through rural 'conservation' holidays.

Organisations at various scales (e.g., national and regional governments and CLC groups at place) can address CLC participation barriers. For example, national government policies targeting conservation-related tax incentives and expense allowances could reduce economic barriers and actively incentivise CLC volunteer participation (Toran, 2014; Volunteering New Zealand, 2020). At a regional government or local CLC group level, recommendations encouraging communication and engagement with more diverse populations (e.g., age, gender, ethnicity, language, religion, culture) may widen and strengthen current and future conservation volunteer profiles (Cameron & Poot, 2019; Gould et al., 2018; Peters et al., 2015; Stats NZ, 2017b).

A further projected demographic barrier to CLC involvement is urban drift and associated rural depopulation (Stats NZ, 2017f). These population changes will likely further reduce CLC volunteer availability and access to rural-based CLC projects. Transport costs to access public

conservation land, mostly in rural areas, may also reduce active ‘on the ground’ volunteer participation. Regional, city, and local council policymakers and CLC groups at place could support rural CLC projects by promoting and subsidising rural conservation volunteering ‘holidays’ to urban dwellers.

Projected diminishing rural volunteer populations could also be supported through regional CLC group networks promoting and providing skill development, best practice, and experience sharing (Kirby & Clarkson, 2016; Nelson Biodiversity Forum, 2019). For example, regular inter-sector workshops and conferences involving wider volunteer organisations (e.g., Volunteering NZ and Conservation Volunteers) could improve volunteer skill development. The best practice could be enhanced through regular two-way information sharing between national agencies (e.g., the Department of Conservation) and local CLC groups (Kirby & Clarkson, 2016) supported by regional coordinators. Practical knowledge and experiences could thus be shared from local to national levels through practical training opportunities and workshops (Kiwi Coast Trust, n.d.).

Conservation-related policies and associated practices depend on reliable representative data (Travers et al., 2021). Current Aotearoa New Zealand conservation volunteer data may under-represent the scale of CLC volunteer involvement as the Stats NZ conservation volunteering category includes dog rescue volunteers, Greenpeace members, and community planters (Stats NZ, 2018b). A more nuanced definition of CLC volunteering, and thus a more accurate measure of CLC efforts, should be developed by Statistics NZ in collaboration with Volunteering NZ, national and regional conservation agencies, NGOs, and representative CLC groups. Such information is essential when developing policy and practice associated with agency expectations (e.g., PF2050) and subsequent CLC support, including funding.

While many external factors, including personal income, ease of access, or time limitations, influence current and intending CLC volunteers, internal factors are also influential. Accessing and utilising such internal factors, including conservation attitudes and hope to benefit CLC activities, form the remainder of this chapter.

### **6.3.2 Accessing and Utilising Conservation Attitudes**

Biodiversity and species monitoring results measure CLC group impacts on biodiversity restoration (Department of Conservation, n.d.-c; Sullivan & Molles, 2016). However, volunteer conservation attitudes, one of the factors contributing to biodiversity restoration (Ganzevoort & Van Den Born, 2020), are not measured. Also under-explored are possible changes in conservation volunteer attitudes as a CLC project moves from initial pest elimination to

maintaining a pest-free area. Few tools exist that monitor volunteer members' attitudes across the lifespan of a project.

A starting point could be further developing the collage-elicited interview and subsequent thematic analysis methodology previously described (**Chapter 4**). Collage-elicited interviews enable non-confrontational, exploratory discussion, utilising thematic analysis to construct conservation attitudes (Ough Dealy et al., 2021). CLC groups could use this tool to elucidate their current thoughts and future aspirations as individuals, sub-groups, or across the entire group (Table 19). Collage topics can be general (e.g., describing the group's present state and projected future) or specific (e.g., pest control choices). Subjects can also be aspirational (e.g., where should the project be in 5 years? How will this happen?) or pragmatic (e.g., anticipating project changes over time from predator control as eradication to maintain a pest-free status, ways of adapting to climate change impacts).

**Table 19**

*Conservation Attitudes May Influence Current Conservation Actions and Future Conservation Intentions: Key Research Findings, Actions, and Specific Approaches*

<b>Key Research Findings</b>	<b>Actions</b>	<b>Specific Approaches</b>
Aotearoa New Zealand conservation attitudes identified, e.g., nature connection, commitment to others, ongoing learning	1. Support a predator-free Aotearoa New Zealand by eliciting then utilising CLC conservation attitudes.	National conservation agencies and NGOs could develop a conservation attitude identification and utilisation training programme (the Accessing and Applying Conservation Attitudes kit – see section 6.3.2.1). This programme could help CLC groups, and individuals understand and employ conservation attitudes within their communities, CLC activities, and funding applications.
	2. Develop policy based on conservation attitude research findings. Devise a range of approaches that capitalise on turning peoples' desire to see an improved environment into personal action for the environment.	Conservation practitioners at national, regional and local levels could incorporate conservation attitudes into CLC volunteer engagement and retention processes. E.g., recruitment communications, CLC activities and events, and training programmes.
	3. Investigate ways to increase and sustain the human-environment connection through direct engagement with CLC groups.	Government agencies should work directly with CLC groups and individuals, identifying and developing existing human-environment connection exemplars. 'Bottom-up' engagement empowers CLC volunteers to become a part of a larger vision, developing individual and group agency (ability to influence and make an impact).

Conservation actions may be landscape scale (e.g., how shall we contribute to PF2050?), local project specific (e.g., weed control in a particular reserve), as well as temporal (e.g., what does our project look like in 1-2 years?). Such collage-elicited interview outcomes could be included in annual and 5-year planning documents. They may also be attached as a conservation attitude status report supporting funding applications and subsequent progress reports (e.g., financial, areas under pest control, and hours volunteered) (Department of Conservation, n.d.-c).

Multi-group landscape-scale predator control projects (e.g., PF2050, Kiwi Coast) may involve hapū/iwi, government agencies (national, regional, and district), CLC groups, and private landowners (Doole, 2020; Kiwi Coast Trust, 2021). Such projects might benefit from collage-generated discussions highlighting shared common ground and less common areas, paving the way for consensus building or agreement to differ where consensus is impossible or desired.

CLC groups are accountable for the outputs of public funding (Department of Conservation, n.d.-d). Regular collage creation and associated discussions could record current attitudes and future aspirations (e.g., annually or five-yearly), thus supplementing progress reporting requirements (Department of Conservation, n.d.-c). Accountability may necessitate reporting on community feedback. A public exhibition of CLC group collages reflecting current achievements and future aspirations may satisfy these reporting requirements. For example, an exhibition of collages from the current research was held at the Russell Museum, Bay of Islands, Aotearoa New Zealand. Members of the public provided written responses to the collages. Additionally, Russell Primary School students and teachers created their own collages in response to the exhibition and the study question (Figure 44).

**Figure 44**

*Foreground. Russell Primary School Students and Teachers Creating Collages at the Russell Museum, Bay of Islands Collage Exhibition.*



*Note. Background. Research collage exhibition. Photo credit: Helen Ough Dealy*

Conservation agencies and CLC groups should develop approaches that invest in current conservation volunteer retention. For example, devising collaborative efforts by CLC groups and conservation agencies to match volunteer interests and abilities to conservation activities, particularly as volunteers age (Niebuur et al., 2018). Consequently, I recommend approaches developed from my research results (Table 19). In Section 6.3.2.1 following, I develop one particular approach more fully, a project proposal titled *Utilising conservation attitudes to support CLC actions*. This practical, cost-effective approach supports CLC group current conservation action and future conservation intention by incorporating conservation attitudes into CLC conservation practice.

### 6.3.2.1 Utilising conservation attitudes to support CLC, Government and NGO conservation-related actions – a project proposal<sup>1</sup>

#### *Background and Associated Issues*

Community-led conservation is essential to supporting biodiversity restoration in Aotearoa New Zealand (Department of Conservation, 2020f). An increasing trend in conservation volunteer workday equivalents, above 36,000 days per annum, has been measured (Department of Conservation, 2021a). More than 600 CLC groups are responsible for this volunteering effort (Peters et al., 2015). Such volunteering constitutes an economically significant contribution to the NZ economy at a remarkably low cost. More than 85% of Aotearoa New Zealand's not-for-profit (NFP) environmental institutions, solely reliant on volunteers, contributed 1.8% of volunteer hours and 1.4% to the national GDP (Stats NZ, 2018b). Over a 12-month period, 201 CLC groups provided \$15.8 million in income, unpaid work, and in-kind contributions (Hardie-Boys, 2010). Necessary biodiversity restoration prerequisites include knowledge and development of relevant practical planting, weeding, and predator control skills. Government agencies already offer practical biodiversity restoration skill development courses (Department of Conservation, n.d.-b, n.d.-e). National and regional conservation-focussed non-governmental organisations (NGO) (e.g., Kiwi Coast, Save the Kiwi) also provide current volunteers with biodiversity restoration skills training, group development workshops, and third-party funding application support (Conservation Volunteers New Zealand, n.d.; Kiwi Coast Trust, 2021; Save the Kiwi, 2021). Such skill development and support may help retain existing volunteers. However, without attracting sufficient future volunteers, such training opportunities, the projects they enable, and the conservation outcomes achieved may disappear (Morais et al., 2013). Thus, supporting current conservation volunteer retention and attracting new volunteers is vital for 1. ongoing CLC group resilience and sustainability and 2. current and future biodiversity restoration.

People volunteer if their needs are met (Kilmartin, 2021). Motivations to volunteer for conservation vary, including attitudes of connection to nature and cooperation with other people (Admiraal et al., 2017; Ough Dealy et al., Under review; West & Pateman, 2016). Such motivations may also vary over time (West & Pateman, 2016). Conservation attitudes relate differently to an individual's current conservation actions and future conservation intentions (Ough Dealy et al., Under review). For example, those currently active in conservation connect to each other and the natural environment; those with future conservation intentions have

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<sup>1</sup> This project proposal utilises template headings created by Dionisio, C. S. (2022). *A project manager's book of templates*. John Wiley & Sons.  
<http://ebookcentral.proquest.com/lib/aut/detail.action?docID=7130210>

other attitudes, such as ‘nature needs our help’, and their actions as individuals are important for the future of the natural world.

Utilising conservation attitudes may facilitate CLC group understanding of ways to support the group’s current conservation actions, future sustainability and resilience (Measham & Barnett, 2008). Training that enables such groups to utilise conservation attitudes is underdeveloped. Such training could support CLC groups, add value to their effectiveness, and motivate present and future conservationists.

Conservation attitudes can be accessed in various ways, including existing surveys (Department of Conservation, 2019e), literature reviews (Ganzevoort & Van Den Born, 2020; Ganzevoort et al., 2017; West & Pateman, 2016), focus groups (Finlay et al., 2004), and collage elicitation (Ough Dealy et al., 2021).

### **Project Vision: Practical Use of the Collage Elicitation Method**

This project proposal outlines how collage elicitation interviews can move from a research technique to a readily accessible, cost-effective conservation group volunteer attraction and retention and reporting tool – the Accessing and Applying Conservation Attitudes (AACA) kit.

The AACA kit would primarily engage with, be accessible to, and be supportive of, CLC groups and their current and prospective members. However, national conservation agencies, conservation NGOs, and regional councils may consider adapting this tool to their needs, e.g., CLC group resources (Rush & Ritchie, 2003).

### ***AACA kit applications***

Three specific uses of the kit are proposed; more may emerge as CLC groups, and conservation agencies/NGOs identify potential uses and develop other applications. These proposed approaches will, 1. assist with current CLC volunteer retention and attraction, 2. support CLC group longevity, and 3. facilitate CLC group accountability.

#### ***1. Retaining and attracting CLC volunteers***

Communications and activities incorporating conservation attitudes expressed by existing and intending volunteers may enhance CLC group resilience. Communications plans could incorporate current volunteer conservation attitudes within their messaging, such as connection to others and the natural world. The AACA kit could elicit current volunteer responses to such messaging to help determine whether the attitudes engendered by the communications plans resonate with those held by current volunteers. To test this alignment, current volunteers could create collages in response to the proposed annual conservation

activity programme. Thematic analysis of members' responses may help the CLC group determine whether the proposed activity (e.g., a family picnic followed by a planting activity) meets members' motivational needs.

A CLC group concerned about future volunteer numbers might design a social media campaign that deliberately incorporates the conservation attitudes of those with future conservation intentions (e.g., nature needs our help, and an individual's actions are important for the future of the natural world). Intending volunteers could be asked to create collages that respond to this proposed social media campaign. Thematic analysis of their responses may help the CLC group determine whether the proposed campaign aligns with these potential volunteers' motivational attitudes.

In summary, identifying attitudinal responses to CLC activities or communications may better align such activities and associated communications, thus facilitating volunteer attraction and retention.

## *2. Supporting CLC group long-term*

AACA kits could track CLC group conservation attitude trends over the life of a biodiversity restoration project, from initial pest elimination to maintaining pest incursion responses. Identifying attitude changes may support a more nuanced approach to conservation activities and communications at different project stages.

## *3. Facilitating CLC group reporting processes*

The AACA kit may improve funding reporting between CLC groups and agencies. Reporting on group conservation attitudes could be utilised as an annual Key Performance Indicator (KPI), enabling actual rather than anticipated alignment between members' attitudes and conservation activities or social media campaigns to be better understood. The reporting process could incorporate attitudinal information alongside the currently expected measures of hectareage under CLC group predator or weed control. Furthermore, should current and intending member attitudes not align with the activities or campaigns offered, a stocktake of conservation activity or social media campaign appropriateness could be instituted.

### **Kit contents**

The AACA kit would comprise collage-making resources (e.g., collage materials, collage-making instructions, and open-ended conservation attitude elicitation questions (Appendix C)) and training materials including videos demonstrating, 1. collage construction, 2. attitude elicitation interviewing, and 3. thematic analysis using the Trello *app*. An online AACA kit training workshop for kit users would be provided. Workshop participants would be trained in

collage creation facilitation techniques, collage-elicited interviewing strategies, and a Trello-based thematic analysis method. Once groups had started using the AACA kit, workshop participants would be offered a follow-up online Q&A session.

### Financing the kit

The AACA kit is an opportunity to foster inter-agency partnerships through shared financial investment. A national agency (e.g. Ministry of Business Innovation & Employment, 2022) research grant could fund the development of the initial kit. National NGOs, including Volunteering NZ and Forest & Bird, could support ongoing production, distribution, and workshop costs.

The indicative costs to develop and produce the AACA kits are based on industry-standard contractor pay rates (Careers.govt.nz, 2022; PayScale, 2022) (Table 20). Individual AACA kit production costs have been derived from costs incurred during original research (Ough Dealy et al., 2021).

**Table 20**

*Accessing and Applying Conservation Attitude (AACA) Kit Development and Production Costings (Careers.govt.nz, 2022; PayScale, 2022)*

<b>Accessing and Applying Conservation Attitudes (AACA) kits</b>				
<b>Task</b>	<b>Average hourly rate</b>	<b>Hours required</b>	<b>Indicative one-off development cost</b>	<b>Indicative per unit cost</b>
<i>Project management</i>				
Oversee and coordinate development, production and dissemination of AACA kits	\$52.00	20	\$1,040.00	
Oversee and coordinate development, production and dissemination of AACA thematic analysis training	\$52.00	20	\$1,040.00	
<i>AACA kit set-up</i>				
AACA kit content and instruction development, design, piloting	\$38.00	40	\$1,520.00	
<i>AACA kit - per unit</i>				
Assembling				\$10.00
Packaging				\$5.00
Collage materials				\$10.00
Instructions (print production)				\$1.00
Courier				\$10.00
<i>AACA kit collage instruction video</i>				
Video development, design, production, piloting	\$37.00	40	\$1,480.00	
<i>AACA kit collage-elicited interviewing video</i>				
Video development, design, production, piloting	\$37.00	40	\$1,480.00	
<i>AACA kit thematic analysis video</i>				
Video development, design, production, piloting	\$37.00	40	\$1,480.00	
<i>AACA kit workshop</i>				
Online workshop development, design, production, piloting	\$30.00	40	\$1,200.00	
<i>AACA Q&amp;A workshop</i>				
Online workshop development, design, production, piloting	\$30.00	40	\$1,200.00	
<i>Supplementary AACA thematic analysis support</i>				
Thematic analysis trainer supports group with one-to-one ACA thematic analysis session	\$38.00	3		\$114.00
Contingencies			\$1,000.00	
<b>Approximate AACA kit development costs</b>			<b>\$11,440.00</b>	
<b>Approximate AACA unit costs</b>				<b>\$150.00</b>

### Benefit-cost ratio

An AACA kit is a novel approach that enables CLC groups to elicit and operationalise conservation attitudes. Consequently, a benefits-cost ratio is not initially readily quantifiable. However, trialling AACA kits among various CLC groups may result in measurable outputs such as improved community and group attitudinal reporting to funding agencies, volunteer attraction and retention rates over a 5-year period. Such reporting may reveal a positive ratio where benefits outweigh the moderate anticipated AACA kit development and production costs. Given that volunteers donate time equal to \$6.1 million a year based on the current minimum wage rate (before tax) (Employment New Zealand, 2022), the AACA kit development cost of approximately \$12,000 is a modest investment.

### 6.3.3 Complex Interactions

Many Aotearoa New Zealand adults believe conservation is important (Department of Conservation, 2020d; Heimann & Medvecky, 2022); despite this belief, conservation volunteer numbers are decreasing (Peters et al., 2015; Volunteering New Zealand, 2020). The general public is one pool from which CLC groups draw current and future members. However, not every member of the public is motivated to act for conservation. My research extends our understanding of the complexity of current and future potential volunteer motivations to act for conservation. In particular, my research identified complicated interactions between conservation attitudes, hope, current conservation action, and future conservation intention. While current actors and those with future conservation intentions shared some conservation attitudes, each group also held dissimilar attitudes. Hope too differed between these two groups.

Meta-analysis of intention-to-act studies indicates that intention changes lead to moderate behaviour changes (Webb & Sheeran, 2006). Thus, understanding interactions between hope and conservation attitudes, intention to act for conservation and conservation action may help address the attitude-behaviour gap, support a continuing supply of conservation volunteers, and consequently, ongoing CLC sustainability (Table 21).

**Table 21***Complex Interactions Between Hope, Conservation Attitudes, Current Conservation Action, and Future Conservation Intention: Key Research Findings, Actions, and Specific Approaches*

<b>Key Research Findings</b>	<b>Actions</b>	<b>Specific Approaches</b>
More hopeful CLC actors intend future CLC activity involvement.	1. Incorporate Hope Theory into CLC recruitment communications	Develop and test recruitment hope-based social media messaging.
	2. Incorporate Hope Theory into future national government or volunteering NGO data collection	Identify potentially active CLC volunteer trends through annual hope and future conservation intention surveys. Specifically, at what point in time does conservation intention become conservation action
	3. Identify population groups with conservation intentions	National and regional conservation agencies use hope and future conservation intention survey results to identify population groupings that may respond well to future engagement with CLC group activities.
The link between hope and current conservation action is unclear	4. Identify influences impacting future action intentions moving to the current action	Longitudinal research into motivational factors associated with moving from intention to act to current action is needed.
Conservation attitudes exist (e.g., connection and commitment to the natural world and others, ongoing learning, nature needing human help to heal, and relating to future conservation intention)	5. Incorporate conservation attitudes into CLC recruitment messaging	CLC groups could incorporate conservation attitudes into their social media recruitment messaging.
	Current conservation actors also have future conservation intentions	6. Adapt CLC activities to current conservation volunteer abilities
	7. Invest in targeted messaging	Conservation attitude research could target messaging, encouragement, and incentivisation to attract different demographic or socio-economic cohorts.

To this end, CLC groups could develop and then incorporate hope theory and conservation attitudes into communications aimed at attracting future intending conservation volunteers (Geiger et al., 2021; Lee et al., 2017). Such communications might focus on social media channels, a popular, high-impact means of engagement (Fischer et al., 2022). Thus podcasts, posts, and tweets incorporating hope-oriented messaging could be utilised as a part of a CLC

recruitment programme. Such messaging could expressly incorporate hope's agency and pathways constructs. For example, "You and your friends (*connection to each other*) have what it takes (agency) to help (pathways and *nature needs human help to heal*) today become a better tomorrow (goal achievement)."<sup>2</sup>

However, conservation intention does not necessarily imply future conservation action (Kollmuss & Agyeman, 2002). Thus testing the efficacy of such messaging to move intending conservation volunteers to conservation actors is essential. One approach might be longitudinal research that identifies the temporal point at which the intention to act becomes action. National and regional councils might track potential CLC involvement patterns over time among the general population. Such annual surveys could also include items that 'match' the intention to act for conservation in the future with present-day action in existing annual surveys (e.g., Department of Conservation, 2020d; Waikato Regional Council, 2020). The resulting data might help identify specific population groups potentially more receptive to conservation recruitment messaging. Such groups may include school students.

Developing a hopeful state of positive anticipation among students has already been identified in climate change and geographical educational programmes (Kidman & Chang, 2021; Li & Monroe, 2015; Ojala, 2012; Seligman et al., 2009). In my research, adult participants with conservation intentions were hopeful. Exploring potential school-aged student relationships between hope and intention to act for conservation may help bridge the gap between environmental education and environmental action (Kollmuss & Agyeman, 2002; Siegel et al., 2018) (Table 22). School-based environmental education programmes could utilise similar hope-based teaching practices, including identifying goals, developing barrier-overcoming strategies and goal achievement skills, and increasing individuals' belief in their abilities. Such constructs could be intentionally incorporated into existing environmental education programmes, e.g., Enviroschools and Toyota Kiwi Guardians (Department of Conservation, n.d.-h; Eames & Mardon, 2020) and community-based health/wellbeing programmes, such as Green Prescriptions (Ministry of Health, 2021). Additionally, community and faith-based groups undertake nature-related work (Arnold et al., 2009; Scherberger, 2011). Such groups may consider incorporating hope-based teaching practices into a less formal environment than schools. Such out-of-school activities may supplement a crowded school-based curriculum. Community-led conservation groups may thus benefit from hope-based community and

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<sup>2</sup> Italicised information relates to conservation attitudes; underlined information relates to Hope Theory constructs.

school-based environmental education programmes, particularly where low conservation action engagement levels exist (Falloon et al., 2021; Kelsey, 2016).

**Table 22**

*Further Complex Interactions Between Hope, Conservation Attitudes, Current Conservation Action, and Future Conservation Intention: Key Research Findings, Actions, and Specific Environmental Education Approaches*

Key Research Findings	Actions	Specific Approaches
Hopeful CLC actors intend future CLC activity involvement.	Incorporate Hope Theory into community and school-based environmental education programmes	Environmental educators could incorporate hope constructs, e.g., identifying goals, developing barrier-overcoming strategies, and goal achievement skills, into their teaching programmes.
	Further engage communities beyond schools by utilising and empowering groups that engage in 'occasional' nature-based conservation activities, e.g., faith- and non-faith-based communities	Environmental educators can visit/offer courses to other occasional nature-based groups, thus adding value and increasing motivation
Adult conservation attitudes exist (e.g., connection and commitment to the natural world and others, ongoing learning, nature needing human help to heal, and relating to future conservation intention)	Investigate conservation attitudes among school-aged students.	Educational and CLC group partnerships could establish practical conservation education credits incorporating and developing school-aged student conservation attitudes.
	Incorporate school-aged student conservation attitudes into environmental education	

My research indicates that adult conservation actors and those with future conservation intentions (**Chapter 5**) (Ough Dealy et al., Under review) espouse various conservation attitudes. Research investigating current and future school-age students' conservation intentions and attitudes may support CLC group-educational institution partnerships incorporating such conservation attitudes into environmental education (Ardoin et al., 2020). Conservation education credits framed by such partnerships could involve secondary and tertiary students in practical 'hands-on' activities led by CLC groups, thus potentially facilitating CLC group future sustainability.

In summary, hope and conservation attitudes have differing impacts on conservation volunteer action and conservation intention. I have suggested practical applications of my research findings within the ambit of conservation volunteering. I now suggest ways my work could be applied in the wider research context.

## 6.4 Wider Research Applications

I have explored the specific areas of conservation attitudes and hope contributing to voluntary conservation action and intention to act. An integral aspect of this research has been developing and applying an uncomplicated, inexpensive research tool – collage-elicited interviewing. This tool has an in-built versatility with the potential to elicit attitudinal information from other areas of social science. For example, future-focussed areas, such as volunteering in general and Sustainable Development Goals (SDG) achievement education in particular, could benefit from exploring hope and motivational attitudes elicited through collage-based interviewing.

### 6.4.1 Volunteering

Aotearoa New Zealand and international volunteer sectors face current and projected volunteer shortages (Hansen & Slagsvold, 2020; Volunteering New Zealand, 2020).

Understanding volunteer motivations is vital for the ongoing viability of these volunteer programmes. Thus, NGOs and government agencies, such as those providing foodbanks and rescuing pet animals (Foodbank, 2022; Pet Rescue, 2022), could consider investigating current and prospective volunteer motivations. The collage-elicited attitude methodology I developed might be adapted to their requirements.

The relationship between hope and public volunteering intention needs further exploration. For example, researching the potential for positive relationships between past conservation actions and volunteering in the present. Incorporating Snyder's State Hope scale into annual volunteering attitude surveys (e.g., Volunteering New Zealand, 2020) may track those with a future intention to volunteer, thus indicating a potential pool of future volunteers.

### 6.4.2 Sustainable Development Goals

The United Nations Sustainable Development Goals (SDG) recognise that achieving peace and prosperity is possible through global partnerships tackling health and education, inequality, economic growth, climate change, and ocean and forest preservation. A perceived lack of SDG educational tools designed for Aotearoa New Zealand students led to the development of practical teaching activities (Anderson & Fromm, 2020). While enabling conversation, collaboration, and engagement, opportunities for assessing student attitudes towards achieving these goals are under-represented. The AACA kit could be adapted to explore the attitudes underlying SDGs; specific lesson objectives for SDG educational tools utilising these motivational attitudes could thus be developed and then tested to determine suitability.

## 6.5 Conclusion

In this thesis, I identified that by 2050, Aotearoa New Zealand's projected population will be ageing, time-poor, income-restricted and living in urban rather than rural areas. These factors are likely to impact future conservation volunteering negatively. I showed that the relationships between conservation volunteering, conservation attitudes and hope are under-researched and underemployed. I developed a practical conservation attitude elicitation methodology and tested an internationally validated hope scale on adult Aotearoa New Zealanders. My research identified complex interactions between conservation attitudes, hope, current conservation action, and future conservation intention.

Furthermore, I recognised that conservation attitude and hope research findings need to be made accessible to CLC groups; otherwise, such findings may remain within academia. Consequently, I developed my conservation attitude elicitation methodology into a practical Accessing and Applying Conservation Attitudes kit for CLC groups, conservation-related government departments and NGOs. Furthermore, I incorporated conservation attitudes and hope into government and NGO policies and CLC group practices associated with communication, recruitment, and motivation, thus facilitating current conservation volunteer retention and future intention to act for conservation. These practical approaches will help address the conservation attitude and hope knowledge-action gap by directly linking my research to supporting current CLC biodiversity restoration actions and future intentions.

World in the Present-day



Note: By Researcher, 2019, collage, mixed media.

World in the Future



Note: By Researcher, 2019, collage, mixed media

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## Glossary

<b>Term</b>	<b>Definition</b>
<i>Affect</i>	The experience of emotions that influence actions and decision-making. Positive affectivity includes cheerfulness, pride, enthusiasm, energy, hope, and joy. Negative affectivity includes sadness, disgust, lethargy, fear, and distress (Ackerman, n.d.).
<i>Agency</i>	An individual's cognitive ability to succeed in specific situations (Bandura, 1982).
<i>Biodiversity</i>	The variability within, between and among living organisms and ecosystems (Convention on Biological Diversity, 2006).
<i>Community-led conservation (CLC)</i>	Generally comprised of locally focussed self-organised, not-for-profit, non-governmental voluntary groups. CLC goals are generally environmental and social. Group size and structure can vary from relatively informal collectives to quasi-corporate entities with formal legal structures and strategic processes (Jones & Kirk, 2018).  Note, in this thesis, CLC does not include individuals acting alone, iwi-, hapū-, whānau-, agency-, business-led or -initiated groups.
<i>Conative</i>	The aspect of mental processes or behaviours directed toward action or change and including impulse, desire, volition, and striving (Collins English Dictionary, n.d.).
<i>Conservation</i>	Protecting, maintaining and, where necessary, restoring the biodiversity of the natural environment.
<i>Endangered species</i>	Any species that is in danger of extinction throughout all or part of its range (UN WCMC, 2019).
<i>Endemism</i>	Organisms restricted to one place and not found elsewhere (Gibbs, 2016, p. 16).
<i>Extinction risk</i>	"the estimated probability of going extinct within a given period of time, [taking] into account population size, the rate of change in population size, geographical distribution, and extent of environmental pressures on them." (Ritchie, n.d.).
<i>Hapū</i>	Indigenous Aotearoa New Zealand term for economic unit of traditional Māori society (Moorfield, 2003-2022a).

<b>Term</b>	<b>Definition</b>
<i>Invasive Alien Species (IAS)</i>	A non-native, non-indigenous, foreign, exotic...species, subspecies, or lower taxon occurring outside of its natural range (past or present) and dispersal potential (i.e. outside the range it occupies naturally or could not occupy without direct or indirect introduction or care by humans) and includes any part, gametes or propagule of such species that might survive and subsequently reproduce (Invasive Species Specialist Group, 2000, p. 5).
<i>Iwi</i>	Indigenous Aotearoa New Zealand term for economic unit of traditional Māori society (Moorfield, 2003-2022b).
<i>Latent variable</i>	Variables that cannot be observed, e.g., values, attitudes, norms (Kyle et al., 2020).
<i>Pākehā</i>	New Zealander of European descent - probably originally applied to English-speaking Europeans living in Aotearoa New Zealand (Moorfield, 2003-2022c).
<i>Pragmatism</i>	A philosophical tradition in which words and thoughts can be used as practical, predictive, problem-solving, active tools and instruments (Cresswell & Cresswell, 2018; O'Leary, 2017).
<i>Predator Free 2050 (PF2050)</i>	Aotearoa New Zealand government-led biodiversity restoration goal of being predator-free by 2050 (Department of Conservation, 2020f; New Zealand Government, 2016)
<i>Thematic analysis (TA)</i>	A qualitative methodology that answers a research question by actively constructing patterns derived from a data set (Kiger & Varpio, 2020).
<i>Volunteer</i>	An individual, motivated by deeply held values and beliefs, donating time, labour, talent, and skills, often without having to be asked to do so, without coercion or expectation of payment, for community and individual volunteer benefit (International Labour Office Geneva, 2011; United Nations, 2011; Volunteering New Zealand, 2021).
<i>Whānau</i>	Indigenous Aotearoa New Zealand term for economic unit of traditional Māori society (Moorfield, 2003-2022d).

# Appendices

## Appendix A. Ethical Approval





**Auckland University of Technology Ethics Committee (AUTECH)**

Auckland University of Technology  
D-88, Private Bag 92006, Auckland 1142, NZ  
T: +64 9 921 9999 ext. 8316  
E: [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz)  
[www.aut.ac.nz/researchethics](http://www.aut.ac.nz/researchethics)

29 January 2019

Michael Petterson  
Faculty of Health and Environmental Sciences

Dear Michael

Re Ethics Application: **18/406 The role of learned hopefulness in community conservation sustainability**

Thank you for providing evidence as requested, which satisfies the points raised by the Auckland University of Technology Ethics Committee (AUTECH).

Your ethics application has been approved in stages for three years until 29 January 2022.

**Non-Standard Conditions of Approval**

1. Please provide Te Reo translations.

Non-standard conditions must be completed before commencing your study. Non-standard conditions do not need to be submitted to or reviewed by AUTECH before commencing your study.

**Standard Conditions of Approval**

1. A progress report is due annually on the anniversary of the approval date, using form EA2, which is available online through <http://www.aut.ac.nz/research/researchethics>.
2. A final report is due at the expiration of the approval period, or, upon completion of project, using form EA3, which is available online through <http://www.aut.ac.nz/research/researchethics>.
3. Any amendments to the project must be approved by AUTECH prior to being implemented. Amendments can be requested using the EA2 form: <http://www.aut.ac.nz/research/researchethics>.
4. Any serious or unexpected adverse events must be reported to AUTECH Secretariat as a matter of priority.
5. Any unforeseen events that might affect continued ethical acceptability of the project should also be reported to the AUTECH Secretariat as a matter of priority.

Please quote the application number and title on all future correspondence related to this project.

AUTECH grants ethical approval only. If you require management approval for access for your research from another institution or organisation, then you are responsible for obtaining it. You are reminded that it is your responsibility to ensure that the spelling and grammar of documents being provided to participants or external organisations is of a high standard.

For any enquiries, please contact [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz)

Yours sincerely,



Kate O'Connor  
Executive Manager  
Auckland University of Technology Ethics Committee

CC: [words\\_that\\_work@xtra.co.nz](mailto:words_that_work@xtra.co.nz); [dmg3827@autuni.ac.nz](mailto:dmg3827@autuni.ac.nz); [rjarvis@aut.ac.nz](mailto:rjarvis@aut.ac.nz)

**Auckland University of Technology Ethics Committee (AUTEC)**

Auckland University of Technology  
D-88, Private Bag 92006, Auckland 1142, NZ  
T: +64 9 921 9999 ext. 8316  
E: [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz)  
[www.aut.ac.nz/researchethics](http://www.aut.ac.nz/researchethics)

23 May 2019

Michael Petterson  
Faculty of Health and Environmental Sciences

Dear Michael

Re: Ethics Application: **18/406 The role of learned hopefulness in community conservation sustainability**

Thank you for your request for approval of amendments to your ethics application.

I have approved minor amendments to your ethics application allowing the expansion of the targeted participant group.

I remind you of the **Standard Conditions of Approval**.


1. The research is to be undertaken in accordance with the [Auckland University of Technology Code of Conduct for Research](#) and as approved by AUTEC in this application.
2. A progress report is due annually on the anniversary of the approval date, using form EA2, which is available online through <http://www.aut.ac.nz/research/researchethics>.
3. A final report is due at the expiration of the approval period, or, upon completion of project, using form EA3, which is available online through <http://www.aut.ac.nz/research/researchethics>.
4. Any amendments to the project must be approved by AUTEC prior to being implemented. Amendments can be requested using the EA2 form: <http://www.aut.ac.nz/research/researchethics>.
5. Any serious or unexpected adverse events must be reported to AUTEC Secretariat as a matter of priority.
6. Any unforeseen events that might affect continued ethical acceptability of the project should also be reported to the AUTEC Secretariat as a matter of priority.

Please quote the application number and title on all future correspondence related to this project.

AUTEC grants ethical approval only. If you require management approval for access for your research from another institution or organisation then you are responsible for obtaining it. If the research is undertaken outside New Zealand, you need to meet all locality legal and ethical obligations and requirements.

For any enquiries please contact [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz)

Yours sincerely,



Kate O'Connor  
Executive Manager  
Auckland University of Technology Ethics Committee

Cc: [words\\_that\\_work@tra.co.nz](mailto:words_that_work@tra.co.nz); [dmg3827@autunilac.nz](mailto:dmg3827@autunilac.nz); [rjarvis@aut.ac.nz](mailto:rjarvis@aut.ac.nz)

## Appendix B. Information Sheets, Consent and Assent Forms, and Interview Protocols

### Pilot Participant Information Sheet



#### **Pilot Participant Information Sheet**

Date Information Sheet Produced:

26 October 2018

#### **Project Title**

The role of learned hopefulness in community conservation sustainability

An Invitation

Kia ora,

My name is Helen Ough Dealy. I am a PhD student in the School of Science at Auckland University of Technology (AUT). I am currently studying towards a doctorate in Applied Conservation finding out whether hopefulness influences whether people are more likely to be active conservationists.

You are invited to take part in this pilot study as your views may help improve the research study when others are invited to take part. The results from this research study may influence the design and content of environmental education resources. You may also find it interesting to learn something about your own level of hopefulness.

#### **What is the purpose of this research?**

The purpose of this research is to find out (1) whether there is a connection between how hopeful people are and whether they are active in conservation, and (2) whether improving environmental education through teaching learned hopefulness, can increase students' levels of hope.

### **How was I identified and why am I being invited to participate in this research?**

You have been chosen to take part in this research because you are one of the following:

- A local hapū representative;
- A Bay of Islands primary or secondary student in either an English-speaking Enviroschool or non-Enviroschool;
- A Bay of Islands primary or secondary student in either a te reo speaking Enviroschool or non-Enviroschool;
- An adult member of a Bay of Islands community conservation group or an adult member of a community non-conservation group e.g. U3A;
- An AUT tertiary student from the AUT conservation group or an AUT pre-service teacher trainee;
- An environmental education professional.

You have been chosen to take part as you were recommended as someone who might be able to represent the views of one of the above groups. You have been recruited by word of mouth.

I approached the leader of your group e.g. marae chair, community group chair, pre-service teacher trainee tutor and requested that the invitation to take part in this research be passed on to you. I do not currently hold any of your personal contact details and will only request that information if you want to have any research results sent to you.

You have been included in this pilot study as your comments about the collage-making activity, hope scale and conservation action items will help determine whether these tools provide stable information about hopefulness and involvement in conservation in an Aotearoa New Zealand context. Your comments will also help identify any difficulties with the scale language.

### **How do I agree to participate in this research pilot study?**

Your participation in this research is voluntary (it is your choice) and whether you choose to participate will neither advantage nor disadvantage you. You can withdraw from the pilot study at any time. If you choose to withdraw from the pilot study, then you will be offered the choice between having any data that is identifiable as belonging to you removed or allowing it to continue to be used. However, once the findings have been produced, removal of your data may not be possible. If you are 16 or over and choose to take part in the research, please read and sign the attached consent form. If you are less than 16 your parent or guardian will need to fill in a consent form for you, you will need to complete an assent form.

I would like to include the collage that you make as part of this research in a public exhibition, possibly at a local museum or marae. You can choose whether you have your name and age on your collage or not. You might prefer just your first name, your age or no identifying information at all.

### **What will happen in this research?**

You will take part in an initial information session with me, the researcher, either in class if you are a student, or over the phone, if you are an adult. Then you will be asked to spend as much time as you like, perhaps up to 45 minutes, by yourself, at home, if you prefer, creating two collages (pictures made up of drawing, cutting up other images, fabric glued on etc). One collage will be about the world you live in today; the other about the world you would like to live in the future. You need to include yourself in each of the collages. A selection of collage materials will be available for you to take home with you; you can also use your own materials as well.

You will need to write some words (narrative) describing each of your collages: what the world is or will be like; what you are currently or will be doing in that world; why you are acting in this way currently or in the future; and how you got here today and how you will get to that future.

Once your narratives and collages are completed, there will be a face-to-face meeting with me, the researcher, at school/university if a student; if not a student, at a convenient public place (e.g. café or library). Please bring your collages and your narratives with you so that we can talk about them. At this meeting I will ask you to talk about your collages. I will use the same questions for every person who takes part. These questions are intended to help you tell me as much as possible about your collages. These conversations will be recorded. Your comments will then be transcribed (written down) and any common themes brought out. From these common themes several new scale items will be created to be used by other research participants.

You will be asked to complete an up to 10-item Future Scale at the start of and after the face-to-face session.

You will be asked to provide basic information about yourself, including: age, gender, school attending currently, frequency and type of volunteer conservation effort in previous week, month, year; ethnicity; te reo ability; intention to get involved in conservation; what kind of conservation and when will you be doing it. If you want to have research results sent to you, you can also provide your contact details e.g. email address.

You will also be asked to comment on any difficulties you have with the Future Scale, question sheet and collage activity. If you have any suggestions about ways of improving these aspects of the research, you are welcome to give them.

### **Te reo**

If you prefer, the conversations about your collage can be held in te reo and the Future Scale translated into te reo. If you prefer being interviewed in te reo rather than English, Kipa Munro, a fluent te reo speaker will be in the session as well as me.

### **What are the benefits?**

By taking part in this research you will learn about your own levels of hopefulness and attitudes towards conservation action.

If you choose, your collages will be framed and returned to you as a thank-you for your participation. With your permission, your collages and some of your thoughts about them may be included in an art exhibition at a Bay of Islands museum and/or marae for members of the public to view and respond to. These exhibitions will produce some information about the views of the public on hopefulness and conservation action.

The research findings may be used to help develop current environmental education resources that better equip students to be conservation activists in the future. It is also possible that the findings will help construct environmental education strategies and associated policies leading to a pest-free New Zealand by 2050.

In addition, this research will be a part of my post-graduate qualification (PhD) with the potential for future research-oriented employment. The research results may be written up and published in academic journals and presented at scientific conferences.

### **How will my privacy be protected?**

Your privacy will be protected in the following ways:

Your name will not be attached to anything you produce. I will not know who has provided which information.

I will only receive your contact details if you decide to give them to me. The contact details will only be used to send you the research results.

All data will be gathered together with the data from everyone else in your group. This means that individual results cannot be connected back to individual participants.

All data collected will be stored in a safe secure place at AUT Auckland University of Technology, for a minimum of six years, it will then be destroyed.

### **What are the costs of participating in this research?**

There will be a time commitment involved. The first meeting may take 15 minutes. The collages and narratives may take 30-45 minutes. The face-to-face meeting may take between 45 minutes and an hour.

If the face-to-face meeting is held in a public place such as a café, reasonable travel costs will be reimbursed, and light refreshments provided.

**What opportunity do I have to consider this invitation?**

You will have at least four weeks in which to decide whether you will or will not take part in this research.

**Will I receive feedback on the results of this research?**

Yes, if you would like feedback about the results of this research, I will send a 1-2 page report to you by email or by post. Please indicate whether you would like to receive feedback in the consent or assent forms.

**What do I do if I have concerns about this research?**

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Professor Mike Petterson, [michael.petterson@aut.ac.nz](mailto:michael.petterson@aut.ac.nz), 0800 288864 ext 9439.

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEK, Kate O'Connor, [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz), 09-921 9999 ext 6038.

**Whom do I contact for further information about this research?**

Please keep this Information Sheet and a copy of the Consent/Assent Form for your future reference. You are also able to contact the research team as follows:

**Researcher Contact Details:**

Helen Ough Dealy, [dmg3827@autuni.ac.nz](mailto:dmg3827@autuni.ac.nz)

**Project Supervisor Contact Details:**

Professor Mike Petterson, [Michael.petterson@aut.ac.nz](mailto:Michael.petterson@aut.ac.nz), 0800 288864 Extn 9439

Approved by the Auckland University of Technology Ethics Committee on 29 January 2019, AUTEK Reference number 18/406.

## Primary Student Information Sheet



### Collage Participant Information Sheet – Primary Students

Date Information Sheet Produced:

1 February 2019

#### Project Title

The role of learned hopefulness in community conservation sustainability

An Invitation

Kia ora,

My name is Helen Ough Dealy. I am a PhD student in the School of Science at Auckland University of Technology (AUT). I am interested in whether hopeful people are more likely to volunteer to help the environment.

You are invited to take part in this research as the way you look at things may help others and your ideas may also improve environmental education. You may also find it interesting to learn something about how hopeful you are.

#### What is the purpose of this research?

The purpose of this research is to find out (1) whether there is a connection between how hopeful people are and whether they are active in conservation, and (2) whether improving environmental education through teaching learned hopefulness, can increase students' levels of hope.

#### How was I identified and why am I being invited to participate in this research?

You are invited to take part in this research because you are either:

- A Bay of Islands primary student in an English-speaking EnviroSchool or
- A Bay of Islands primary student in an English-speaking non-EnviroSchool

I approached your classroom teacher and asked that this invitation to take part in this research be passed on to you. I do not hold any of your personal contact details and will only ask for that information if you want to have any of the research results sent to you.

#### **How do I agree to participate in this research?**

It is your choice whether you take part in this research; taking part will neither advantage nor disadvantage you. You can withdraw from the study at any time. If you choose to withdraw from the study, then you can choose to either have any information belonging or identifiable as yours removed or you can allow it to be used in the study. However, once the research results have been produced, it may not be possible to remove your information.

If you choose to take part in the research, please read and sign the consent form. If you are under 16, your parent or guardian will need to sign the consent form for you and you will sign an assent form. The consent and assent forms are attached to this information sheet.

#### **What will happen in this research?**

The first session will take part with me, the researcher, at school; this session will take about 10 minutes. We will go through what you will be doing in the study. The research will involve you, at home, by yourself, spending up to 45 minutes, creating two collage pictures. Collages are pictures made up of drawing, cutting up other images, fabric glued on etc. One collage will be about the world you live in today; the other about the world you would like to live in in the future. You need to include yourself in each of the collages. You can take collage materials home with you; you can also use your own materials as well.

You will also be asked to write a short story for each of your two collages talking about: what the world is or will be like; what you are doing now or will be doing in that world; why you are acting like this now or will be in the future; and how you got to what you are doing today and how you will get to that future.

Once your stories and collages are completed, you will meet again with me, the researcher, at your school. At this meeting we will talk about your collage pictures, so please make sure to bring them along. I will use the same questions for every person who takes part. These questions are to help you tell me as much as possible about your pictures. These conversations between us will be recorded. Your stories will then be written down and any common themes brought out for use in a later part of the research.

At the start and the finish of this meeting talking about your pictures, I will ask you to complete a questionnaire to do with the way you see the future (Future Scale).

You will also be asked to provide basic information about yourself, including: age, gender, school you go to, whether you help as a conservation volunteer.

## **Te reo**

If you prefer, the conversations about your collage picture can be held in te reo; the Future Scale and information about yourself can also be translated into te reo. If you prefer being interviewed in te reo rather than English, Kipa Munro, a fluent te reo speaker, will be in the session as well as me.

### **What are the benefits to you of taking part in the research?**

By taking part in this research you will learn about how hopeful you are and what you think about conservation.

If you choose, your collages will be framed and returned to you as a thank-you for taking part.

If you agree, your collages and your stories about them may be included in an art exhibition at a Bay of Islands museum and/or marae for the public to see and talk about. These exhibitions will produce some information about what the general public think about hopefulness and conservation.

The research findings may be used to develop environmental education resources that help students to become active in conservation in the future.

It is also possible that the research findings will help construct environmental education strategies and associated policies leading to a pest-free New Zealand by 2050.

In addition, this research will be a part of my post-graduate qualification (PhD) with the potential for future research-oriented employment. The research results may be written up and published in academic journals and presented at scientific conferences.

### **Who will own the collage pictures and stories?**

The researcher will own the collages and their stories that you create. This means that she can use copies of the images and stories in future research, presentations and publications. If you have agreed, these images and stories will have your name attached to them. You are, however, free to choose to have the original collage pictures and their stories returned to you.

### **How will my privacy be protected?**

Your privacy will be protected in the following ways:

I would like to include the collage pictures and their stories that you have made in a public exhibition, possibly at a local museum or marae. You can choose whether you have your name and age on your collage or not. You might prefer just your first name, your age or no identifying information at all.

If you decide not to have your name attached to any of your information, I will not know who has written which information.

I will only receive your contact details if you decide to give them to me. The contact details will only be used to send you the research results and your collages and the stories you have written about them if you ask for them.

All information from the Future Scale will be gathered together with other students' information. This means that your answers cannot be connected back to you.

All information will be stored in a safe secure place at AUT Auckland University of Technology, for a minimum of six years, it will then be destroyed.

**What are the costs of participating in this research?**

You will need to give some time if you are taking part in this study. The first meeting may take 10 minutes. The collages and stories may take 30-45 minutes. The second meeting may take between 45 minutes and an hour.

**How much time will I have to think about this invitation?**

You will have about four weeks to decide whether you will or will not take part in this research.

**Will I receive the results of this research?**

Yes, if you would like the results of this research, I will send a 1-2 page report to you by email or by post. Please let me know whether you would like to receive the research results on the consent or assent form.

**What do I do if I have concerns about this research?**

If you have any worries about this project, please contact the Project Supervisor, Professor Mike Petterson, [michael.petterson@aut.ac.nz](mailto:michael.petterson@aut.ac.nz), 0800 288864 ext 9439.

If you are worried about the way this research is being carried out, please contact the Executive Secretary of AUTEK, Kate O'Connor, [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz), 09-921 9999 ext 6038.

*Whom do I contact for further information about this research?*

Please keep this Information Sheet and a copy of the Consent/Assent Form for your future reference. You are also able to contact the research team as follows:

**Researcher Contact Details:**

Helen Ough Dealy, [dmg3827@autuni.ac.nz](mailto:dmg3827@autuni.ac.nz)

**Project Supervisor Contact Details:**

Professor Mike Petterson, [Michael.petterson@aut.ac.nz](mailto:Michael.petterson@aut.ac.nz), 0800 288864 Extn 9439

## Secondary Student Information Sheet



### Collage Participant Information Sheet – Secondary students

Date Information Sheet Produced:

1 February 2019

#### Project Title

The role of learned hopefulness in community conservation sustainability

An Invitation

Kia ora,

My name is Helen Ough Dealy. I am a PhD student in the School of Science at Auckland University of Technology (AUT). I am interested in whether hopeful people are more likely to volunteer to help the environment.

You are invited to take part in this research as the way you look at things may help others and your ideas may also improve environmental education. You may also find it interesting to learn something about how hopeful you are.

#### What is the purpose of this research?

The purpose of this research is to find out (1) whether there is a connection between how hopeful people are and whether they are active in conservation, and (2) whether improving environmental education through teaching learned hopefulness, can increase students' levels of hope.

#### How was I identified and why am I being invited to participate in this research?

You are invited to take part in this research because you are either:

- A Bay of Islands secondary student in an English-speaking EnviroSchool or
- A Bay of Islands secondary student in an English-speaking non-EnviroSchool

I approached your classroom teacher and asked that this invitation to take part in this research be passed on to you. I do not hold any of your personal contact details and will only ask for that information if you want to have any of the research results sent to you.

#### **How do I agree to participate in this research?**

It is your choice whether you take part in this research; taking part will neither advantage nor disadvantage you. You can withdraw from the study at any time. If you choose to withdraw from the study, then you can choose to either have any information belonging or identifiable as yours removed or you can allow it to be used in the study. However, once the research results have been produced, it may not be possible to remove your information.

If you choose to take part in the research, please read and sign the consent form. If you are under 16, your parent or guardian will need to sign the consent form for you and you will sign an assent form. The consent and assent forms are attached to this information sheet.

#### **What will happen in this research?**

The first session will take part with me, the researcher, at school; this session will take about 10 minutes. We will go through what you will be doing in the study. The research will involve you, at home, by yourself, spending up to 45 minutes, creating two collage pictures. Collages are pictures made up of drawing, cutting up other images, fabric glued on etc. One collage will be about the world you live in today; the other about the world you would like to live in in the future. You need to include yourself in each of the collages. You can take collage materials home with you; you can also use your own materials as well.

You will also be asked to write a short story for each of your two collages talking about: what the world is or will be like; what you are doing now or will be doing in that world; why you are acting like this now or will be in the future; and how you got to what you are doing today and how you will get to that future.

Once your stories and collages are completed, you will meet again with me, the researcher, at your school. At this meeting we will talk about your collage pictures, so please make sure to bring them along. I will use the same questions for every person who takes part. These questions are to help you tell me as much as possible about your pictures. These conversations between us will be recorded. Your stories will then be written down and any common themes brought out for use in a later part of the research.

At the start and the finish of this meeting talking about your pictures, I will ask you to complete a questionnaire to do with the way you see the future.

You will also be asked to provide basic information about yourself, including: age, gender, school you go to, whether you help as a conservation volunteer.

## **Te reo**

If you prefer, the conversations about your collage picture can be held in te reo; the Future Scale and information about yourself can also be translated into te reo. If you prefer being interviewed in te reo rather than English, Kipa Munro, a fluent te reo speaker, will be in the session as well as me.

### **What are the benefits to you of taking part in the research?**

By taking part in this research you will learn about how hopeful you are and what you think about conservation.

If you choose, your collages will be framed and returned to you as a thank-you for taking part.

If you agree, your collages and your stories about them may be included in an art exhibition at a Bay of Islands museum and/or marae for the public to see and talk about. These exhibitions will produce some information about what the general public think about hopefulness and conservation.

The research findings may be used to develop environmental education resources that help students to become active in conservation in the future.

It is also possible that the research findings will help construct environmental education strategies and associated policies leading to a pest-free New Zealand by 2050.

In addition, this research will be a part of my post-graduate qualification (PhD) with the potential for future research-oriented employment. The research results may be written up and published in academic journals and presented at scientific conferences.

### **Who will own the collage pictures and stories?**

The researcher will own the collages and their stories that you create. This means that she can use copies of the images and stories in future research, presentations and publications. If you have agreed, these images and stories will have your name attached to them. You are, however, free to choose to have the original collage pictures and their stories returned to you.

### **How will my privacy be protected?**

Your privacy will be protected in the following ways:

I would like to include the collage pictures and their stories that you have made in a public exhibition, possibly at a local museum or marae. You can choose whether you have your name and age on your collage or not. You might prefer just your first name, your age or no identifying information at all.

If you decide not to have your name attached to any of your information, I will not know who has written which information.

I will only receive your contact details if you decide to give them to me. The contact details will only be used to send you the research results and your collages and the stories you have written about them if you ask for them.

All information from the Future Scale will be gathered together with other students' information. This means that your answers cannot be connected back to you.

All information will be stored in a safe secure place at AUT Auckland University of Technology, for a minimum of six years, it will then be destroyed.

**What are the costs of participating in this research?**

You will need to give some time if you are taking part in this study. The first meeting may take 10 minutes. The collages and stories may take 30-45 minutes. The second meeting may take between 45 minutes and an hour.

**How much time will I have to think about this invitation?**

You will have about four weeks to decide whether you will or will not take part in this research.

**Will I receive the results of this research?**

Yes, if you would like the results of this research, I will send a 1-2 page report to you by email or by post. Please let me know whether you would like to receive the research results on the consent or assent form.

**What do I do if I have concerns about this research?**

If you have any worries about this project, please contact the Project Supervisor, Professor Mike Petterson, [michael.petterson@aut.ac.nz](mailto:michael.petterson@aut.ac.nz), 0800 288864 ext 9439.

If you are worried about the way this research is being carried out, please contact the Executive Secretary of AUTEK, Kate O'Connor, [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz), 09-921 9999 ext 6038.

**Whom do I contact for further information about this research?**

Please keep this Information Sheet and a copy of the Consent/Assent Form for your future reference. You are also able to contact the research team as follows:

**Researcher Contact Details:**

Helen Ough Dealy, [dmg3827@autuni.ac.nz](mailto:dmg3827@autuni.ac.nz)

**Project Supervisor Contact Details:**

Professor Mike Petterson, [Michael.petterson@aut.ac.nz](mailto:Michael.petterson@aut.ac.nz), 0800 288864 Extn 9439

## AUT Student Information Sheet



### Collage Participant Information Sheet – AUT students

Date Information Sheet Produced:

4 July 2019

#### Project Title

The role of learned hopefulness in community conservation sustainability

An Invitation

Kia ora,

My name is Helen Ough Dealy. I am a PhD student in the School of Science at Auckland University of Technology (AUT). I am currently studying towards a doctorate in Applied Conservation finding out whether hopefulness influences whether people are more likely to be active conservationists.

You are invited to take part in this research as your views may help others become more hopeful in the area of conservation. This may also influence the design and content of environmental education resources. You may also find it interesting to learn something about your own level of hopefulness.

#### What is the purpose of this research?

The purpose of this research is to find out (1) whether there is a connection between how hopeful people are and whether they are active in conservation, and (2) whether improving environmental education through teaching learned hopefulness, can increase students' levels of hope.

#### How was I identified and why am I being invited to participate in this research?

You are invited to take part in this research because you are an AUT (Auckland University of Technology) student.

You have been recruited through Blackboard. I do not currently hold any of your personal contact details and will only request that information if you want to have any research results sent to you.

### **How do I agree to participate in this research?**

Your participation in this research is voluntary (it is your choice) and whether you choose to participate will neither advantage nor disadvantage you. You can withdraw from the study at any time. If you choose to withdraw from the study, then you will be offered the choice between having any information that is identifiable as belonging to you removed or allowing it to continue to be used. However, once the findings have been produced, removal of your information may not be possible. If you choose to take part in the research, please read and sign the attached consent form.

### **What will happen in this research?**

You will take part in an initial information session with me, the researcher either in class if you are a student, or over the phone, if you are an adult. If you prefer, that initial meeting can be at a convenient public place (e.g. café/library). Then you will be asked to spend as much time as you like, perhaps up to 45 minutes, by yourself, creating two collages (pictures made up of drawing, cutting up other images, fabric glued on etc). One collage will be about the world you live in today; the other about the world you would like to live in the future. You need to show yourself in each of the collages. A selection of collage materials will be made available to you to take home; you can also use your own materials as well.

You will need to write a short statement (narrative) for each of your collages that includes: what the world is or will be like; what you are currently or will be doing in that world; why you are acting in this way currently or in the future; and how you got here today and how you will get to that future.

Once your narratives and collages are completed, there will be a face-to-face meeting with me, the researcher, at AUT; the meeting will be at a convenient public place (e.g. café/library). Please bring your collages and your narratives with you so that we can talk about them. At this meeting I will ask you to talk about your collages. I will use the same questions for every person who takes part. These are intended to help you tell me as much as possible about your collages. These conversations will be recorded. Your comments will then be transcribed (written down) and any common themes brought out. From these common themes a number of new items will be created to be used by other research participants.

At the start and the finish of this meeting talking about your pictures, I will ask you to complete a questionnaire to do with the way you see the future.

You will be asked to provide basic information about yourself, including: age, gender, school attending currently, frequency and type of volunteer conservation effort in previous week, month, year; ethnicity; te reo ability; intention to get involved in conservation - when? What type?

### **What are the benefits?**

By taking part in this research you will learn about your own levels of hopefulness and attitudes towards conservation action.

If you choose, your collages will be framed and returned to you as a thank-you for your participation.

With your permission, your collages and some of your thoughts about them may be included in an art exhibition at a Bay of Islands museum for members of the public to view and respond to. These exhibitions will produce some information about the views of the public on hopefulness and conservation action.

The research findings may be used to help develop current environmental education resources that better equip students to be conservation activists in the future.

It is also possible that the findings will help construct environmental education strategies and associated policies leading to a pest-free New Zealand by 2050.

In addition, this research will be a part of my post-graduate qualification (PhD) with the potential for future research-oriented employment. The research results may be written up and published in academic journals and presented at scientific conferences.

#### **Who will own the collage pictures and stories?**

The researcher will own the collages and their stories that you create. This means that she can use copies of the images and stories in future research, presentations and publications. If you have agreed, these images and stories will have your name attached to them. You are, however, free to choose to have the original collage pictures and their stories returned to you.

#### **How will my privacy be protected?**

Your privacy will be protected in the following ways:

I would like to include the collage pictures and their stories that you have made in a public exhibition, possibly at a local museum or marae. You can choose whether you have your name and age on your collage or not. You might prefer just your first name, your age or no identifying information at all.

Your name will not be attached to any of your data. I will not know who has written which information.

I will only receive your contact details if you decide to give them to me. The contact details will only be used to send you the research results and your collage and narrative if you request this.

All information from the Future Scale will be gathered together. This means that individual results cannot be connected back to individual participants.

All data collected will be stored in a safe secure place at AUT Auckland University of Technology, for a minimum of six years, it will then be destroyed.

**What are the costs of participating in this research?**

There will be a time commitment involved. The first meeting may take 10 minutes. The collages and narratives may take 30-45 minutes. The face-to-face meeting may take between 45 minutes and an hour.

If the face-to-face meeting is held in a public place such as a café or library, reasonable travel costs will be reimbursed and light refreshments provided.

**What opportunity do I have to consider this invitation?**

You will have about four weeks to decide whether you will or will not take part in this research.

**Will I receive feedback on the results of this research?**

Yes, if you would like feedback about the results of this research, I will send a 1-2 page report to you by email or by post. Please indicate whether you would like to receive feedback in the consent forms.

**What do I do if I have concerns about this research?**

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Professor Mike Petterson, [michael.petterson@aut.ac.nz](mailto:michael.petterson@aut.ac.nz), 0800 288864 ext 9439.

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEK, Kate O'Connor, [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz), 09-921 9999 ext 6038.

**Whom do I contact for further information about this research?**

Please keep this Information Sheet and a copy of the Consent Form for your future reference. You are also able to contact the research team as follows:

**Researcher Contact Details:**

Helen Ough Dealy, [dmg3827@autuni.ac.nz](mailto:dmg3827@autuni.ac.nz)

**Project Supervisor Contact Details:**

Professor Mike Petterson, [Michael.petterson@aut.ac.nz](mailto:Michael.petterson@aut.ac.nz), 0800 288864 Extn 9439

Approved by the Auckland University of Technology Ethics Committee on 29 January 2019, AUTEK Reference number 18/406.

## Adult Information Sheet



### Collage Participant Information Sheet - Adult

Date Information Sheet Produced:

1 February 2019

#### Project Title

The role of learned hopefulness in community conservation sustainability

An Invitation

Kia ora,

My name is Helen Ough Dealy. I am a PhD student in the School of Science at Auckland University of Technology (AUT). I am currently studying towards a doctorate in Applied Conservation finding out whether hopefulness influences whether people are more likely to be active conservationists.

You are invited to take part in this research as your views may help others become more hopeful in the area of conservation. This may also influence the design and content of environmental education resources. You may also find it interesting to learn something about your own level of hopefulness.

#### What is the purpose of this research?

The purpose of this research is to find out (1) whether there is a connection between how hopeful people are and whether they are active in conservation, and (2) whether improving environmental education through teaching learned hopefulness, can increase students' levels of hope.

#### How was I identified and why am I being invited to participate in this research?

You are invited to take part in this research because you are one of the following:

- A local hapu representative;
- An adult member of a community conservation group or an adult member of a non-community non-conservation group;

- An AUT tertiary student or an AUT pre-service teacher trainee;
- An environmental education professional.

You are invited to take part as you could be a suitable representative of views of one of the above groups. You have been recruited in response to an advert

I do not currently hold any of your personal contact details and will only request that information if you want to have any research results sent to you.

### **How do I agree to participate in this research?**

Your participation in this research is voluntary (it is your choice) and whether you choose to participate will neither advantage nor disadvantage you. You can withdraw from the study at any time. If you choose to withdraw from the study, then you will be offered the choice between having any information that is identifiable as belonging to you removed or allowing it to continue to be used. However, once the findings have been produced, removal of your information may not be possible. If you choose to take part in the research, please read and sign the attached consent form.

### **What will happen in this research?**

You will take part in an initial information session with me, the researcher either in class if you are a student, or over the phone, if you are an adult. If you prefer, that initial meeting can be at a convenient public place (e.g. café/library). Then you will be asked to spend as much time as you like, perhaps up to 45 minutes, by yourself, creating two collages (pictures made up of drawing, cutting up other images, fabric glued on etc). One collage will be about the world you live in today; the other about the world you would like to live in the future. You need to show yourself in each of the collages. A selection of collage materials will be made available to you to take home; you can also use your own materials as well.

You will need to write a short statement (narrative) for each of your collages that includes: what the world is or will be like; what you are currently or will be doing in that world; why you are acting in this way currently or in the future; and how you got here today and how you will get to that future.

Once your narratives and collages are completed, there will be a face-to-face meeting with me, the researcher, at university if a student; if you are not a student, the meeting will be at a convenient public place (e.g. café/library). Please bring your collages and your narratives with you so that we can talk about them. At this meeting I will ask you to talk about your collages. I will use the same questions for every person who takes part. These are intended to help you tell me as much as possible about your collages. These conversations will be recorded. Your comments will then be transcribed (written down) and any common themes brought out. From these common themes a number of new items will be created to be used by other research participants.

At the start and the finish of this meeting talking about your pictures, I will ask you to complete a questionnaire to do with the way you see the future.

You will be asked to provide basic information about yourself, including: age, gender, school attending currently, frequency and type of volunteer conservation effort in previous week, month, year; ethnicity; te reo ability; intention to get involved in conservation - when? What type?

### **Te reo**

If you prefer, the conversations about your collage can be held in te reo and the Future Scale translated into te reo. If you prefer being interviewed in te reo rather than English, a fluent te reo speaker will be in the session as well as me.

### **What are the benefits?**

By taking part in this research you will learn about your own levels of hopefulness and attitudes towards conservation action.

If you choose, your collages will be framed and returned to you as a thank-you for your participation.

With your permission, your collages and some of your thoughts about them may be included in an art exhibition at a Bay of Islands museum and/or marae for members of the public to view and respond to. These exhibitions will produce some information about the views of the public on hopefulness and conservation action.

The research findings may be used to help develop current environmental education resources that better equip students to be conservation activists in the future.

It is also possible that the findings will help construct environmental education strategies and associated policies leading to a pest-free New Zealand by 2050.

In addition, this research will be a part of my post-graduate qualification (PhD) with the potential for future research-oriented employment. The research results may be written up and published in academic journals and presented at scientific conferences.

### **Who will own the collage pictures and stories?**

The researcher will own the collages and their stories that you create. This means that she can use copies of the images and stories in future research, presentations and publications. If you have agreed, these images and stories will have your name attached to them. You are, however, free to choose to have the original collage pictures and their stories returned to you.

### **How will my privacy be protected?**

Your privacy will be protected in the following ways:

I would like to include the collage pictures and their stories that you have made in a public exhibition, possibly at a local museum or marae. You can choose whether you have your name and age on your collage or not. You might prefer just your first name, your age or no identifying information at all.

Your name will not be attached to any of your data. I will not know who has written which information.

I will only receive your contact details if you decide to give them to me. The contact details will only be used to send you the research results and your collage and narrative if you request this.

All information from the Future Scale will be gathered together. This means that individual results cannot be connected back to individual participants.

All data collected will be stored in a safe secure place at AUT Auckland University of Technology, for a minimum of six years, it will then be destroyed.

### **What are the costs of participating in this research?**

There will be a time commitment involved. The first meeting may take 10 minutes. The collages and narratives may take 30-45 minutes. The face-to-face meeting may take between 45 minutes and an hour.

If the face-to-face meeting is held in a public place such as a café or library, reasonable travel costs will be reimbursed and light refreshments provided.

### **What opportunity do I have to consider this invitation?**

You will have about four weeks to decide whether you will or will not take part in this research.

### **Will I receive feedback on the results of this research?**

Yes, if you would like feedback about the results of this research, I will send a 1-2 page report to you by email or by post. Please indicate whether you would like to receive feedback in the consent or assent forms.

### **What do I do if I have concerns about this research?**

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Professor Mike Petterson, [michael.petterson@aut.ac.nz](mailto:michael.petterson@aut.ac.nz), 0800 288864 ext 9439.

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEK, Kate O'Connor, [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz), 09-921 9999 ext 6038.

**Whom do I contact for further information about this research?**

Please keep this Information Sheet and a copy of the Consent/Assent Form for your future reference.

You are also able to contact the research team as follows:

**Researcher Contact Details:**

Helen Ough Dealy, [dmg3827@autuni.ac.nz](mailto:dmg3827@autuni.ac.nz)

**Project Supervisor Contact Details:**

Professor Mike Petterson, [Michael.petterson@aut.ac.nz](mailto:Michael.petterson@aut.ac.nz), 0800 288864 Extn 9439

Approved by the Auckland University of Technology Ethics Committee on 29 January 2019, AUTEK Reference number 18/406.

## Making a Collage



### Collage Protocol Information Sheet

*Project title:*                    *The role of learned hopefulness in community conservation sustainability*

*Project Supervisor:*        *Professor Mike Petterson*

*Researcher:*                    *Helen Ough Dealy*

#### **What is a collage?**

Collages are pictures made from all kinds of materials, for example: cloth, paper, ink, paint, fabric, found objects (leaves, bark), plastic, magazine pictures, newspaper clippings. These materials are usually glued or fixed onto a piece of paper or card.

#### **How long does it take to make a collage?**

Making a collage doesn't have to take long. Allow yourself about 15 – 30 minutes to create a collage.

#### **How do I make a collage?**

You don't have to be the best artist to make a collage. Making a collage is a great way for people who are not artists to create pictures.

The researcher will give you a box of collage materials including 2 pieces of A3 paper, glue, scissors and a range of pencils, felt-tip pens, crayons, magazines, coloured card, fabric, cellotape.

You can use the materials in the box, and any other materials you have found yourself, to make two collages.

### **What should the collages be about?**

While you are making your first collage, think about the world you live in today; the second collage should be about the world you would like to live in the future. You need to include a picture/drawing/illustration of yourself in both collages.

### **What else do I need to do?**

You will need to write a short statement about each of your collages.

For the today's world collage, please describe:

- what the world is like today
- what you are doing in this collage
- why you are doing what you are doing
- how you got to be doing the activity that is shown in this collage

For the world in the future, please describe:

- what the world will be like in the future
- what you will be doing in the world of the future
- why you will be doing what you are doing
- how you will get to be doing that activity in the future

### **Whom do I contact for further information about this research?**

Please keep this Information Sheet for your future reference. You are also able to contact the research team as follows:

#### **Researcher Contact Details:**

Helen Ough Dealy, [dmg3827@autuni.ac.nz](mailto:dmg3827@autuni.ac.nz)

#### **Project Supervisor Contact Details:**

Professor Mike Petterson, [Michael.petterson@aut.ac.nz](mailto:Michael.petterson@aut.ac.nz), 0800 288864 Extn 9439

Approved by the Auckland University of Technology Ethics Committee on 29 January 2019, AUTEK Reference number 18/406.

## Demographic Information Form



### Demographic questions

1. How old were you at your last birthday? *Please circle one age range:*

5 – 10	21 – 25	36 – 40	51 – 55	66 – 70	81 +
11 – 15	26 – 30	41 – 45	56 – 60	71 – 75	
16 – 20	31 – 35	46 – 50	61 – 65	76 – 80	

2. Are you: Male, Female, Other? *Please circle one of the following:*

Male          Female          Other (*Please describe, if you wish*)

3. Are you: NZ Māori, NZ Pākehā (European), Pasifika, Other? *Please circle one or more of the following:*

NZ Māori          NZ Pākehā (European)          Pasifika          Other (*Please define*)

4. How would you rate your spoken or reading ability in te reo? *Please circle one or more of the terms that describe your spoken and written ability in te reo:*

### *Speaking*

None    Some spoken words    Basic conversation    Fluent speaker

*Reading*

None    Some written words    Basic reading    Fluent reader

5. Are you a school student? *Please circle either "Yes" or "No".*

*If "Yes", please write the name of the school below:*

6. Do you do anything for conservation? *Please circle those that you do.*

Planting    Weeding    Controlling pests    Other (*Please list*)

7. How often do you carry out these conservation actions? *Please circle the answer that suits you best:*

Planting    Weekly    Monthly    Once a year    Other (*Please describe*)

Weeding    Weekly    Monthly    Once a year    Other (*Please describe*)

Controlling pests Weekly    Monthly    Once a year    Other (*Please describe*)

Other (*See Q. 6*) Weekly    Monthly    Once a year    Other (*Please describe*)

8. When did you last carry out a conservation action? *Please put in the month and year, if you know.*

9. Do you think you will carry out conservation actions in the future? *Please circle "Yes" or "No".*

Yes                      No

*If you answered "Yes", go to Question 10.*

10. When, in the future, will you carry out these conservation actions? *Please circle the answer that suits you best:*

Planting      Later this year      Next year      In 5 years      In 10 years      Other (*Please describe*)

Weeding      Later this year      Next year      In 5 years      In 10 years      Other (*Please describe*)

Controlling pests      Later this year      Next year      In 5 years      In 10 years      Other (*Please describe*)

Other (See Q. 7)      Later this year      Next year      In 5 years      In 10 years      Other (*Please describe*)

11. In the future, what kinds of conservation actions can you see yourself taking part in?  
*Please circle the answer that suits you best:*

Planting      Weeding      Controlling pests      Other (*Please list*)

## Collage Assent Form – Primary and Secondary Student (Under 16 years)



### Collage Assent Form – Primary & Secondary Student

*Project title:*                    *The role of learned hopefulness in community conservation sustainability*

*Project Supervisor:*        *Prof. Mike Petterson*

*Researcher:*                    *Helen Ough Dealy*

- I have read and understood the information sheet telling me what will happen in this study and why it is important.
- I have been able to ask questions and to have them answered.
- I understand that notes will be taken during the interviews, these will also be recorded and written down.
- I understand that the collage pictures, and the stories I produced to describe them, will belong to the researcher.
- I understand that I can stop being part of this study whenever I want, and it is perfectly ok for me to do this.
- If I stop being part of the study, I understand that I will then be offered the choice between having any information that that other people can know is about me removed or letting the researcher keep using it. I also understand that sometimes, if the results of the research have been written, some information about me may not be able to be removed.
- I wish to have my collages being included in a public exhibition at Russell Museum and/or Bay of Islands marae.
- I wish to have my identifying details attached to my collage and stories and included in a public exhibition at the Russell Museum and/or Bay of Islands marae (please tick the ones you prefer):

Full name:                      Yes     No

First name only:              Yes     No

Age (in years):                Yes     No

I wish to receive a summary of the research findings (please tick one): Yes     No

I understand that my contact details (email or postal address) will be needed by the researcher so that she can send the research results to me.

I agree to take part in this research.

Participant's signature: .....

Participant's name: .....

Participant Contact Details (if appropriate):

Email .....

Post .....

Date:

*Approved by the Auckland University of Technology Ethics Committee on 29 January 2019, AUTEK Reference number 18/406.*

*Note: The Participant should retain a copy of this form.*

## Collage Consent Form – Parent/Guardian



### Parent/Guardian Consent Form

*Project title:*                    *The role of learned hopefulness in community conservation sustainability*

*Project Supervisor:*        *Professor Mike Petterson*

*Researcher:*                    *Helen Ough Dealy*

- I have read and understood the information provided about this research project in the Information Sheet dated 1 February 2019.
- I have had an opportunity to ask questions and to have them answered.
- I understand that notes will be taken during the interviews and that they will also be audio-taped and transcribed.
- I understand that taking part in this study is voluntary (my choice) and that I may withdraw my child/children from the study at any time without being disadvantaged in any way.
- I understand that if I withdraw my child/children from the study then I will be offered the choice between having any data that is identifiable as belonging to my child/children removed or allowing it to continue to be used. However, once the findings have been produced, removal of this data may not be possible.
- I wish to have my child/children's collages and stories being included in a public exhibition at Russell Museum and/or Bay of Islands marae.
- I wish to have child/children's identifying details attached to their collages and stories and included in a public exhibition at the Russell Museum and/or Bay of Islands marae (please tick the ones you prefer):

Full name:                                Yes     No

First name only:                        Yes     No

Age (in years):                         Yes     No

I wish to receive a summary of the research findings (please tick one): Yes  No

I understand that my contact details (email or postal address) will be needed by the researcher so that she can send the research results to me.

I agree to my child/children taking part in this research.

Child/children's name/s: .....

.....

Parent/Guardian's signature: .....

Parent/Guardian's name: .....

Parent/Guardian's Contact Details (if appropriate):

Email: .....

Post: .....

.....

Date:

*Approved by the Auckland University of Technology Ethics Committee on 29 January 2019, AUTEK Reference number 18/406.*

*Note: The Guardian/Parent should retain a copy of this form.*

## Collage Consent and Release Form – Secondary Student (16 years and over)



### Collage Consent and Release Form – Secondary Student

*Project title:*                    *The role of learned hopefulness in community conservation sustainability*

*Project Supervisor:*        *Professor. Mike Petterson*

*Researcher:*                    *Helen Ough Dealy*

- I have read and understood the information provided about this research project in the Information Sheet dated 1 February 2019.
- I have been able to ask questions and to have them answered.
- I understand that taking part in this study is my choice. I understand that I can stop being part of this study whenever I want and that it is perfectly ok for me to do this.
- I have read and understood the information sheet telling me what will happen in this study and why it is important.
- I understand that notes will be taken during the interviews; they will also be recorded and written down.
- I understand that the collage pictures, and the stories I produced to describe it, will belong to the researcher.
- If I stop being part of the study, I understand that I will then be offered the choice between having any information that that other people can know is about me removed or letting the researcher keep using it. I also understand that sometimes, if the results of the research have been written, some information about me may not be able to be removed.
- I permit the researcher to use the collages that are part of this project and/or any drawings from them and any other reproductions or adaptations from them, either complete or in part, alone or in conjunction with any wording and/or drawings solely and exclusively for the art exhibition and related data collection.
- I understand that the collages and collage stories will be used for academic purposes, this may include being displayed as part of a temporary art exhibition at a Bay of Islands Museum and/or Bay of Island marae. The collages and collage stories will not be published in any form outside of this project without my written permission.
- I understand that any copyright material created by the collage sessions is owned by the researcher and that I do not own copyright of any of the collages or stories I have created.

- I wish to have my identifying details attached to my collage and stories and included in a public exhibition at the Russell Museum and/or Bay of Islands marae (please tick the ones you prefer):

Full name:      Yes     No

First name only: Yes     No

Age (in years):    Yes     No

I understand that my contact details (email or postal address) will be needed by the researcher so that she can send the research results to me.

I wish to receive a summary of the research findings (please tick one): Yes     No

I agree to take part in this research.

Participant's signature: .....

Participant's name: .....

Participant's Contact Details (if appropriate):

Email: .....

Post: .....

Date:

*Approved by the Auckland University of Technology Ethics Committee on 29 January 2019, AUTEK Reference number 18/406. Note: The Participant should retain a copy of this form.*

## Collage Consent and Release Form – AUT Student and Adult



### Collage Consent and Release Form – AUT Student and Adult

*Project title:*                    *The role of learned helpfulness in community conservation sustainability*

*Project Supervisor:*        *Professor Mike Petterson*

- *Researcher:*                    *Helen Ough Dealy*
- I have read and understood the information provided about this research project in the Information Sheet dated 1 February 2019.
- I have been able to ask questions and to have them answered.
- I understand that taking part in this study is my choice. I understand that I can stop being part of this study whenever I want and that it is perfectly ok for me to do this.
- I have read and understood the information sheet telling me what will happen in this study and why it is important.
- I understand that notes will be taken during the interviews; they will also be recorded and written down.
- I understand that the collage pictures, and the stories I produced to describe it, will belong to the researcher.
- If I stop being part of the study, I understand that I will then be offered the choice between having any information that that other people can know is about me removed or letting the researcher keep using it. I also understand that sometimes, if the results of the research have been written, some information about me may not be able to be removed.
- I permit the researcher to use the collages that are part of this project and/or any drawings from them and any other reproductions or adaptations from them, either complete or in part, alone or in conjunction with any wording and/or drawings solely and exclusively for the art exhibition and related data collection.
- I understand that the collages and collage stories will be used for academic purposes, this may include being displayed as part of a temporary art exhibition at a Bay of Islands Museum and/or Bay of Island marae. The collages and collage stories will not be published in any form outside of this project without my written permission.
- I understand that any copyright material created by the collage sessions is owned by the researcher and that I do not own copyright of any of the collages or stories I have created.

- I wish to have my identifying details attached to my collage and stories and included in a public exhibition at the Russell Museum and/or Bay of Islands marae (please tick the ones you prefer):

Full name:      Yes     No

First name only: Yes     No

Age (in years):    Yes     No

I understand that my contact details (email or postal address) will be needed by the researcher so that she can send the research results to me.

I wish to receive a summary of the research findings (please tick one): Yes     No

I agree to take part in this research.

Participant's signature: .....

Participant's name: .....

Participant's Contact Details (if appropriate):

Email: .....

Post: .....

Date:

*Approved by the Auckland University of Technology Ethics Committee on 29 January 2019, AUTEK Reference number 18/406.*

*Note: The Participant should retain a copy of this form.*



## Collage Interview Protocol – Primary and Secondary Student

Interview group: \_\_\_\_\_

Interviewee code: \_\_\_\_\_

Interviewer: \_\_\_\_\_

Language: Te reo/English

Date: \_\_\_\_\_

Time: \_\_\_\_\_

Location: \_\_\_\_\_

### Collage-related Interviews

*Introductory Protocol (read out loud by interviewer)*

Kia ora, my name is Helen Ough Dealy. I am a PhD student in the School of Science at AUT, Auckland University of Technology. I am currently studying towards a doctorate in Applied Conservation. I am really interested in finding out whether more hopeful people are more likely to be conservationists. I hope that you will enjoy being involved in this project.

To make sure that I write down as much of what you are saying as best as I can, I would like to record our conversations today using a voice recorder. You have had a chance to read the information sheet and talk it through with me. This document states that: (1) all information will be held confidential, only researchers on this project will access your recording (2) you have chosen to take part in the research and you may stop at any time if you feel uncomfortable and you can choose to have any of your information removed, and (3) we do not intend to inflict any harm. The recordings will be held securely at AUT and will be destroyed after six years.

Please sign and date the consent or assent form if you wish to take part in this research.

Thank you for agreeing to take part in this research.

### *Introduction*

You have been invited to take part as you are (*a Bay of Islands primary or secondary student in either an English-speaking Enviroschool or non-Enviroschool; a Bay of Islands primary or secondary student in either a te reo speaking Enviroschool or non-Enviroschool*). I approached your teacher and requested that the invitation to take part in this research be passed on to you. I do not currently hold any of your personal contact details. If you would like to be sent a copy of the research results, please include your contact details on the consent or assent form. These contact details will not be linked to your individual responses nor to the research results. You will not be identifiable in any of the research data, results or reporting.

This interview should last between 45 minutes and an hour. During this time, as we talk about the collages you have created and what they mean to you, I will be asking you several questions. These questions may be repeated about different aspects of the collages.

Note: Laddering questions are used here. [Interviewer thoughts are bracketed in the note-taking]

### *Conclusion*

Thank you for taking part in this interview. Your comments have been recorded and will now be transcribed (written down). This material will be used to better understand what other people think about carrying out conservation actions today and in the future.

A further part of the research is to display the collages at the Russell Museum and possibly, a local Bay of Islands marae. This will give the public a chance to think about their conservation actions now and in the future. You can decide whether you want your collages and comments about the collages included, and whether your name and/or age is associated with your collages. If you decide you would like your name and/or age included, here is the Consent/Assent form you will need to sign.

Thank you again for taking part in this research.

(Adapted from Portland State University (n.d.)

### **Reference**

Portland State University. (n.d.). Qualitative Research. Portland,OR: Portland State University.

Approved by the Auckland University of Technology Ethics Committee on 29 January 2019, AUTEK Reference number 18/406.



## Collage Interview Protocol – AUT Student and Adult

Interview group: \_\_\_\_\_

Interviewee code: \_\_\_\_\_

Interviewer: \_\_\_\_\_

Language: Te reo/English

Date: \_\_\_\_\_

Time: \_\_\_\_\_

Location: \_\_\_\_\_

### Collage-related Interviews

*Introductory Protocol (read out loud by interviewer)*

Kia ora, my name is Helen Ough Dealy. I am a PhD student in the School of Science at AUT, Auckland University of Technology. I am currently studying towards a doctorate in Applied Conservation. I am really interested in finding out whether more hopeful people are more likely to be conservationists. I hope that you will find your involvement with this project interesting.

To make sure the note-taking is as accurate as possible, I would like to record our conversations today using a voice recorder. You have had a chance to read the information sheet, this document states that: (1) all information will be held confidential, (2) your participation is voluntary and you may stop at any time if you feel uncomfortable and you can choose to have any of your data removed, and (3) we do not intend to inflict any harm. For your information, only researchers on this project will have access to the recordings. The recordings will be held securely at AUT and will be destroyed after six years.

Please sign and date the consent or assent form if you wish to participate in this research. Thank you for agreeing to take part in this research.

### *Introduction*

You have been chosen to take part as you are (*a local hapu representative; an adult member of a community conservation group or an adult member of a community non-conservation group; an AUT tertiary student or an AUT pre-service teacher trainee; an environmental education professional*). You were recommended as someone who might be able to represent the views of the group you are part of. You have been recruited by word of mouth. I approached the leader of your group (*marae chair, community group chair, pre-service teacher trainee tutor*) and requested that the invitation to take part in this research be passed on to you. I do not currently hold any of your personal contact details. If you would like to be sent a copy of the research results, please include your contact details on the consent or assent form. These contact details will not be linked to your individual responses nor to the research results. You will not be identifiable in any of the research data, results or reporting.

This interview should last between 45 minutes and an hour. During this time, as we talk about the collages you have created and what they mean to you, I will be asking you several questions. These questions may be repeated about different aspects of the collages.

Note: Laddering questions are used here. [Interviewer thoughts are bracketed in the note-taking]

### *Conclusion*

Thank you for taking part in this interview. Your comments will be recorded and then transcribed (written down). This material will be used to better understand what other people think about carrying out conservation actions today and in the future.

A further part of the research is to display the collages at the Russell Museum and possibly, a local Bay of Islands marae. This will give the public a chance to think about their conservation actions now and in the future. You can decide whether you want your collages and comments about the collages included, and whether your name and/or age is associated with your collages. If you decide you would like your name and/or age included, here is the Consent/Assent form you will need to sign.

Thank you again for taking part in this research.

(Adapted from Portland State University (n.d.)

### **Reference**

Portland State University. (n.d.). Qualitative Research. Portland,OR: Portland State University.

Approved by the Auckland University of Technology Ethics Committee on 29 January 2019, AUTEK Reference number 18/406.

## Appendix C. Laddering Interview Questions



### Laddering Interview Questions

#### Background

The interview questions will adopt the laddering technique. “The technique asks about a specific product feature and poses a series of why questions that builds on previous answers. A laddering question sequence usually consists of four questions related to a feature. Sometimes, there may be more than four questions. First, you ask about a feature. “Which feature do you like best?” Second, you listen to the answer, and then you ask about the feature’s functional benefit. “What does the feature do?” Third, you listen to the answer, and ask about the higher benefit of the functional benefit. “What does the functional benefit do for you?” Fourth, you listen to the answer again, and ask about the emotional benefit of the higher benefit. “What does the benefit do for you?”

Once you’ve exhausted a feature, ask about other features and their functional, higher, and emotional benefits.” (FocusGroupTips.com, 2018)

#### Indicative interview questions/prompts

Researcher: “What do you like best about your picture?” [feature]

Researcher: “What is important about x?” [functional benefit]

Researcher: “Why is that important to you?” [higher benefit]

Researcher: “What does (x) do for you?” [emotional benefit]

Researcher: “Is there anything else you would like to tell me about your picture?”

Note: once all aspects of the initial feature have been elicited, the researcher will use a similar sequence of probing questions on other features that have meaning for the participant. The interview will conclude when no new themes emerge, or the participant indicates they wish to stop.

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<https://doi.org/10.1007/s40362-014-0021-3>

## Appendix D. Collages

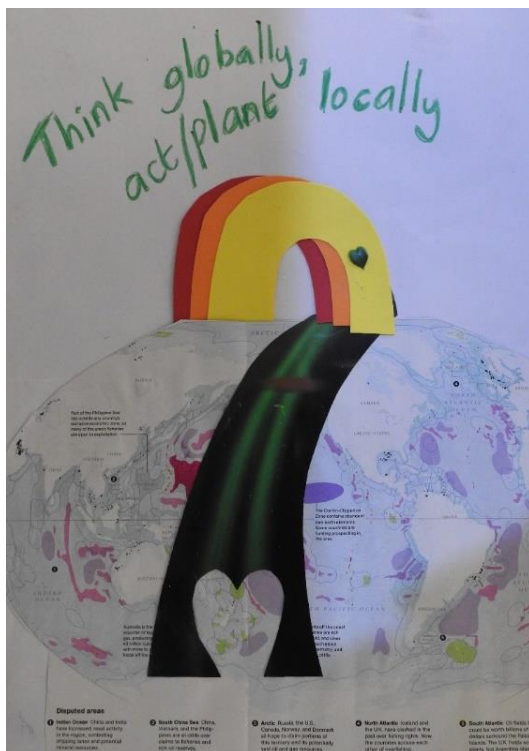
### Researcher

#### *World in the Present-day*



Note: By Researcher, 2019, collage, mixed media

#### *World in the Future*



Note: By Researcher, 2019, collage, mixed media

## Pilot Study

### World in the Present-day



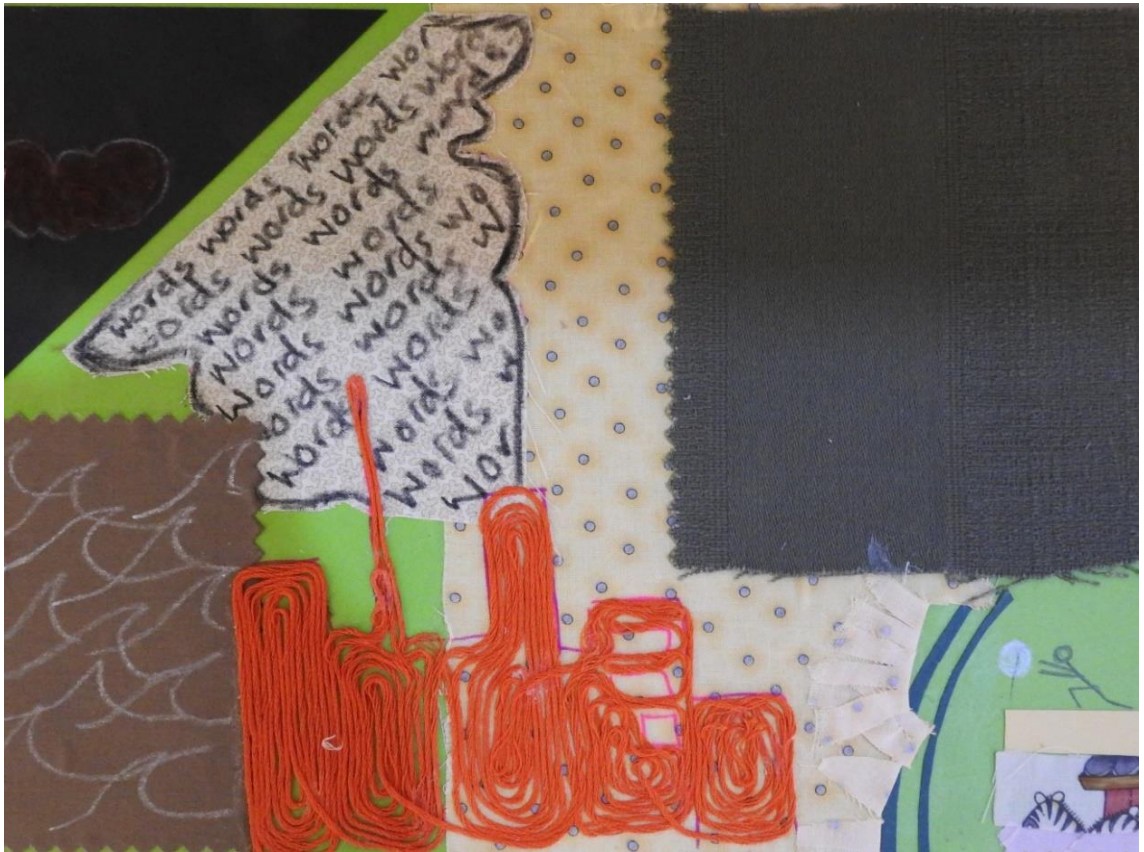
Note: By P8env001, 2019, collage, mixed media

### World in the Future



Note: By P8env001, 2019, collage, mixed media

*World in the Present-day*



Note: By P13non001, 2019, collage, mixed media

*World in the Future*



Note: By P13non001, 2019, collage, mixed media

*World in the Present-day*



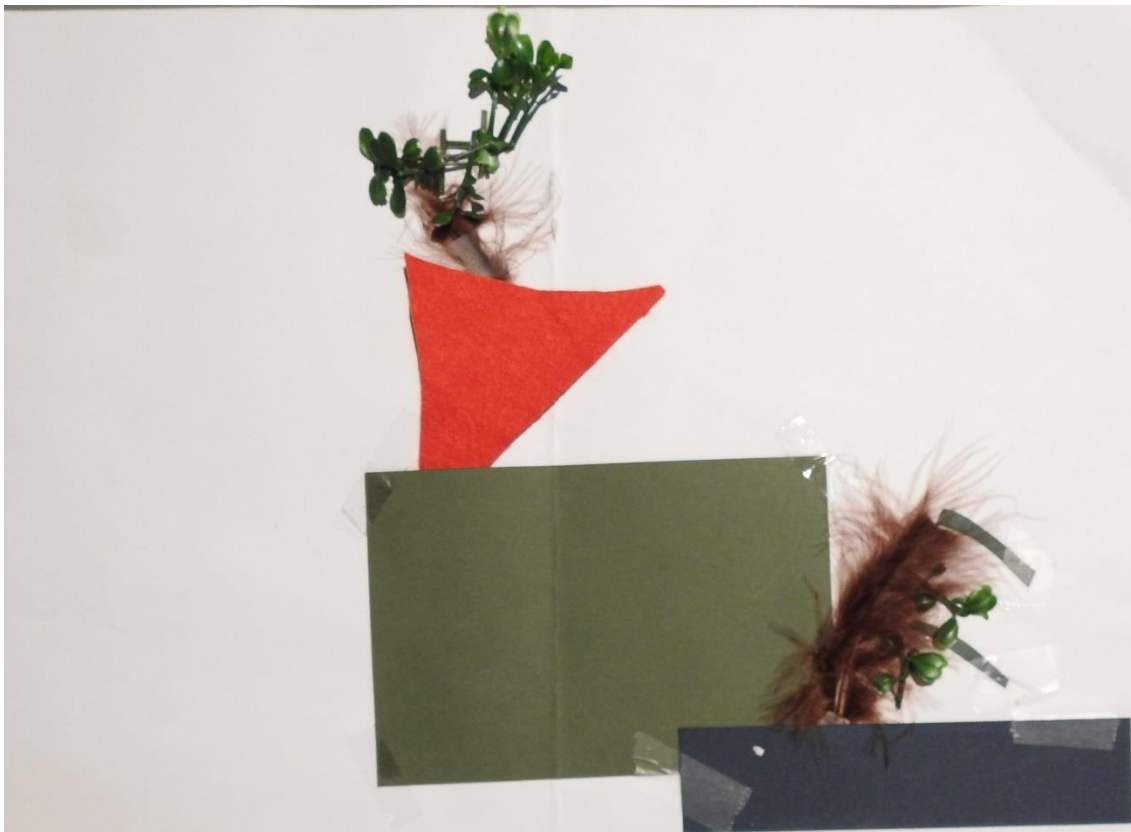
*Note: By PAUT001, 2019, collage, mixed media*

*World in the Future*



*Note: By PAUT001, 2019, collage, mixed media*

*World in the Present-day*



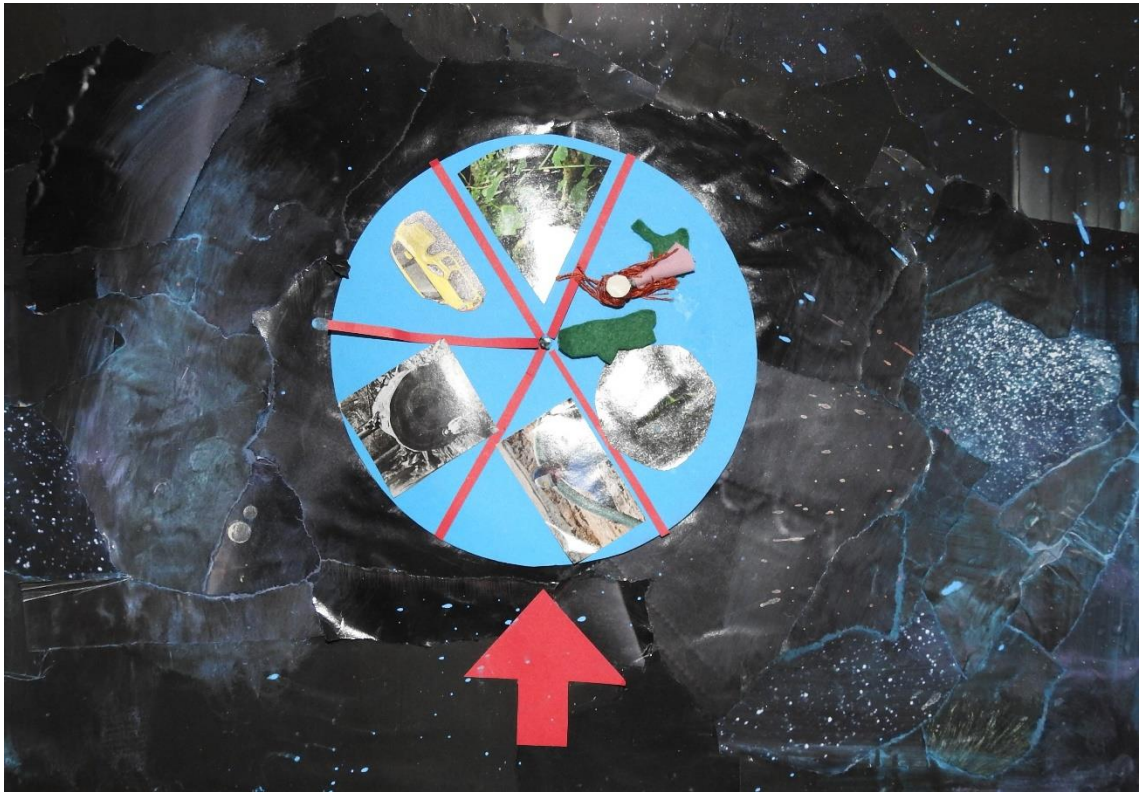
Note: By Pcon001, 2019, collage, mixed media

*World in the Future*



Note: By Pcon001, 2019, collage, mixed media

*World in the Present-day*



*Note: By Pcon002, 2019, collage, mixed media*

*World in the Future*



*Note: By Pcon002, 2019, collage, mixed media*

## Full study

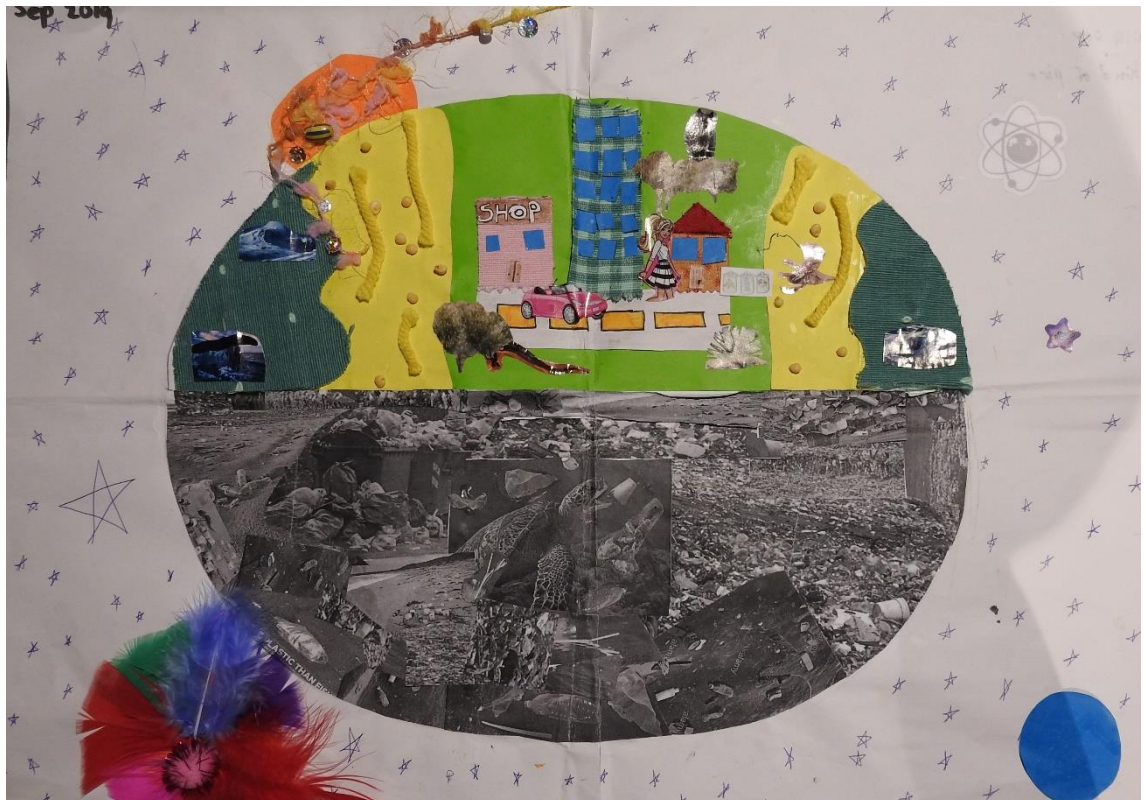
### World in the Present-day

### World in the Future



Note: By 8enved001, 2019, collage, mixed media

### World in the Present-day



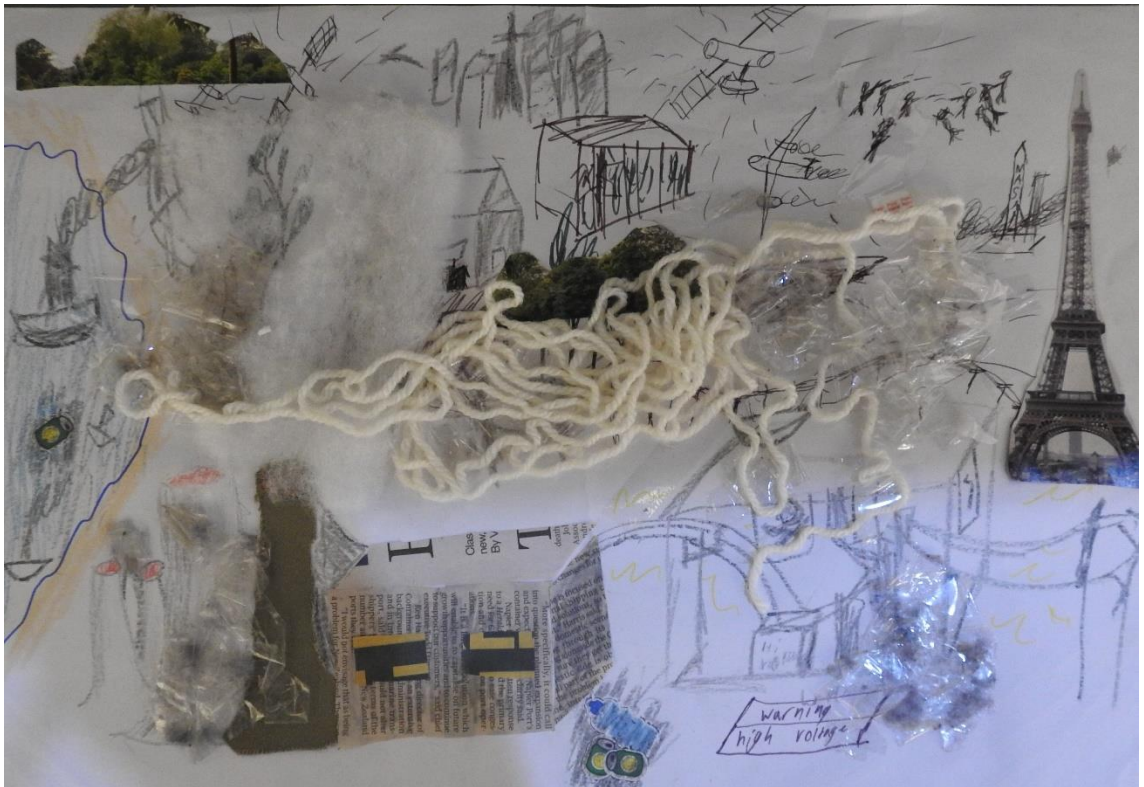
Note: By 8env002, 2019, collage, mixed media

World in the Future



Note: By 8enved002, 2019, collage, mixed media

World in the Present-day



Note: By 8non001, 2019, collage, mixed media

*World in the Future*



Note: By 8non001, 2019, collage, mixed media

*World in the Present-day*



Note: By 8non002, 2019, collage, mixed media

*World in the Future*



Note: By 8non002, 2019, collage, mixed media

*World in the Present-day*



Note: By 8non003, 2019, collage, mixed media

*World in the Future*



Note: By 8non003, 2019, collage, mixed media

*World in the Present-day*



Note: By 8non004, 2019, collage, mixed media

*World in the Future*



Note: By 8non004, 2019, collage, mixed media

*World in the Present-day*



Note: By 8non005, 2019, collage, mixed media

*World in the Future*



Note: By 8non005, 2019, collage, mixed media

*World in the Present-day*



Note: By 13non001, 2019, collage, mixed media

*World in the Future*



Note: By 13non001, 2019, collage, mixed media

*World in the Present-day*



Note: By 13non002, 2019, collage, mixed media

*World in the Future*



Note: By 13non002, 2019, collage, mixed media

*World in the Present-day*



Note: By AUT001, 2019, collage, mixed media

*World in the Future*



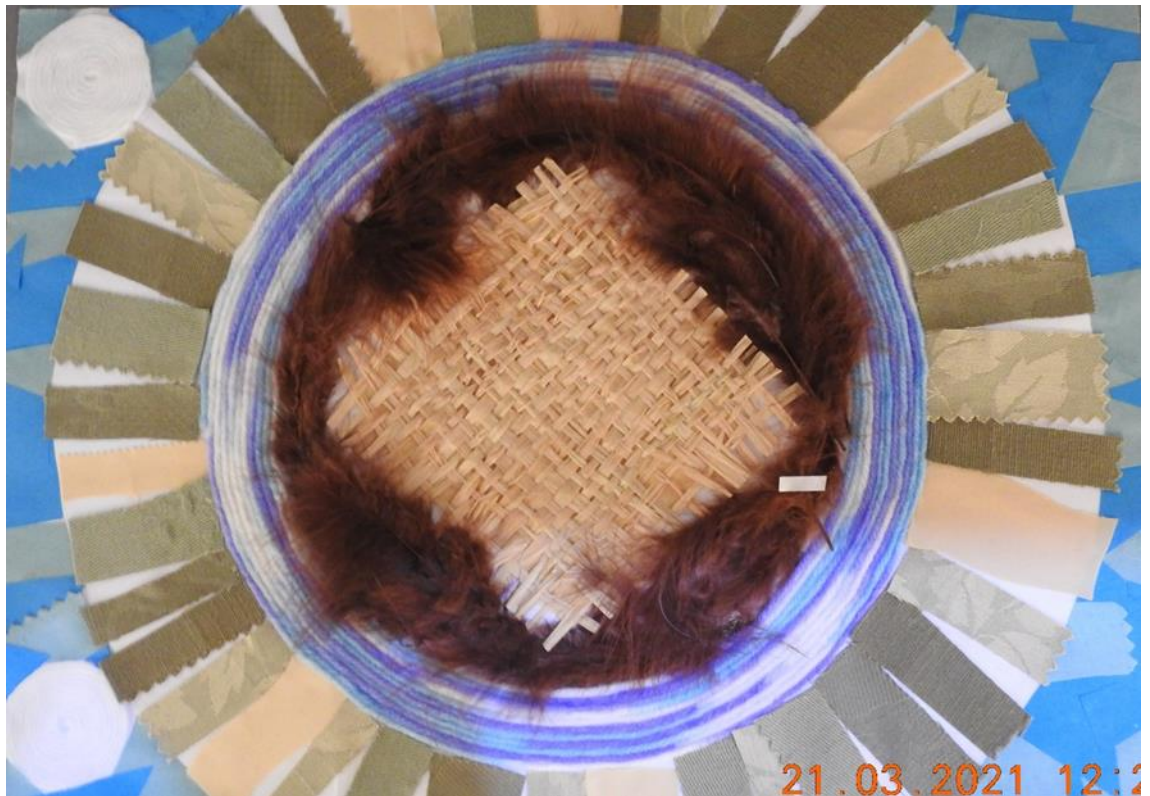
Note: By AUT001, 2019, collage, mixed media

*World in the Present-day*



Note: By AUT002, 2019, collage, mixed media

*World in the Future*



Note: By AUT002, 2019, collage, mixed media

*World in the Present-day*



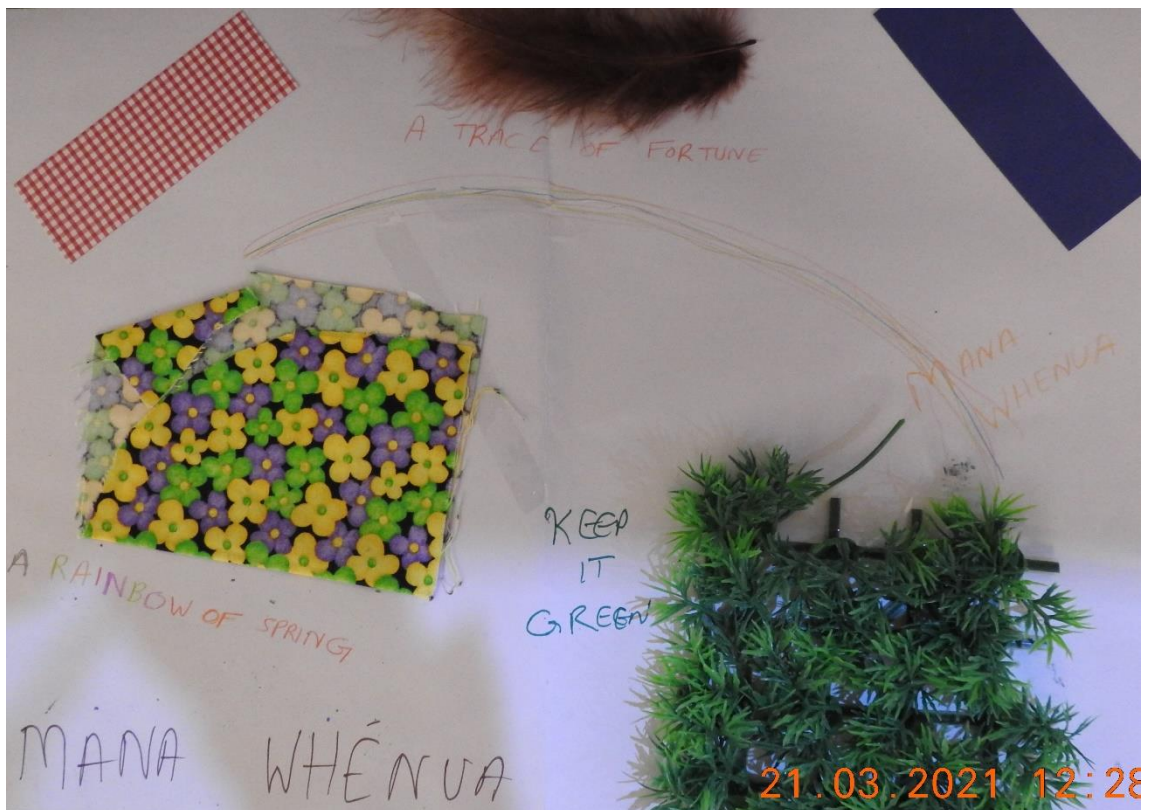
Note: By AUT003, 2019, collage, mixed media

*World in the Future*



Note: By AUT003, 2019, collage, mixed media

*World in the Present-day*



Note: By AUT004, 2019, collage, mixed media

World in the Future



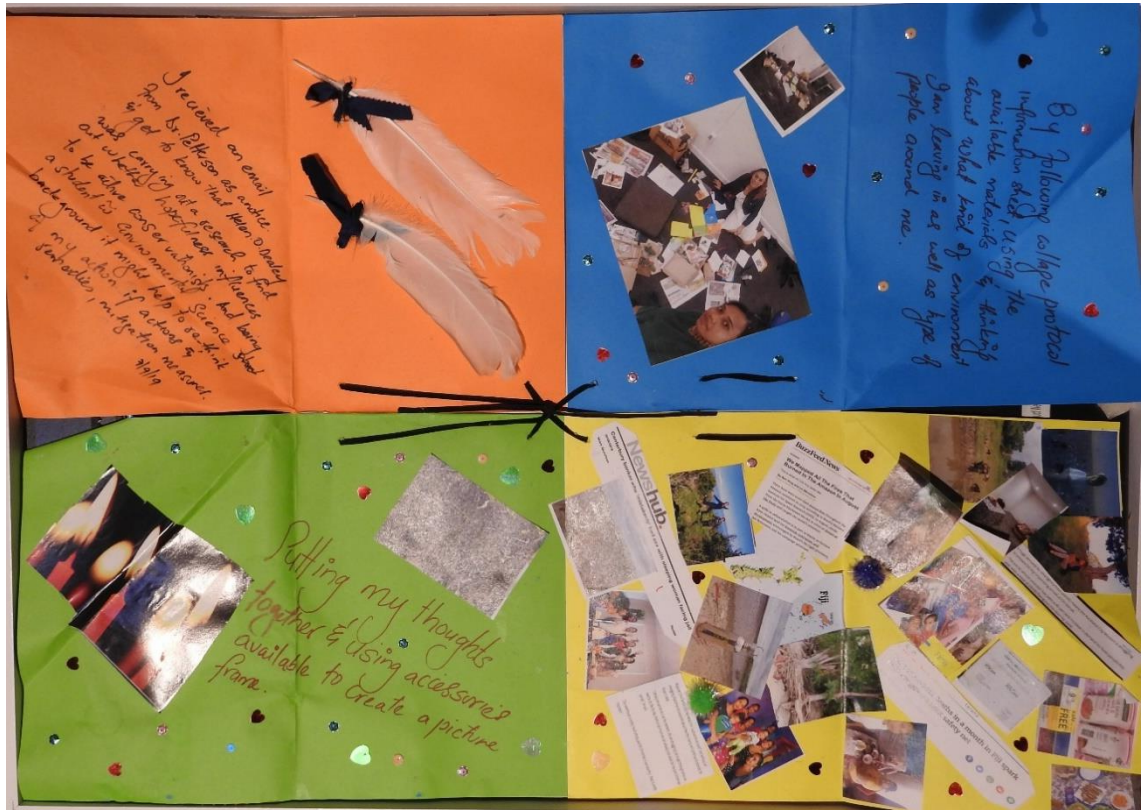
Note: By AUT004, 2019, collage, mixed media

World in the Present-day



Note: By AUT005, 2019, collage, mixed media

World in the Present-day (opened out)



Note: By AUT005, 2019, collage, mixed media

World in the Future



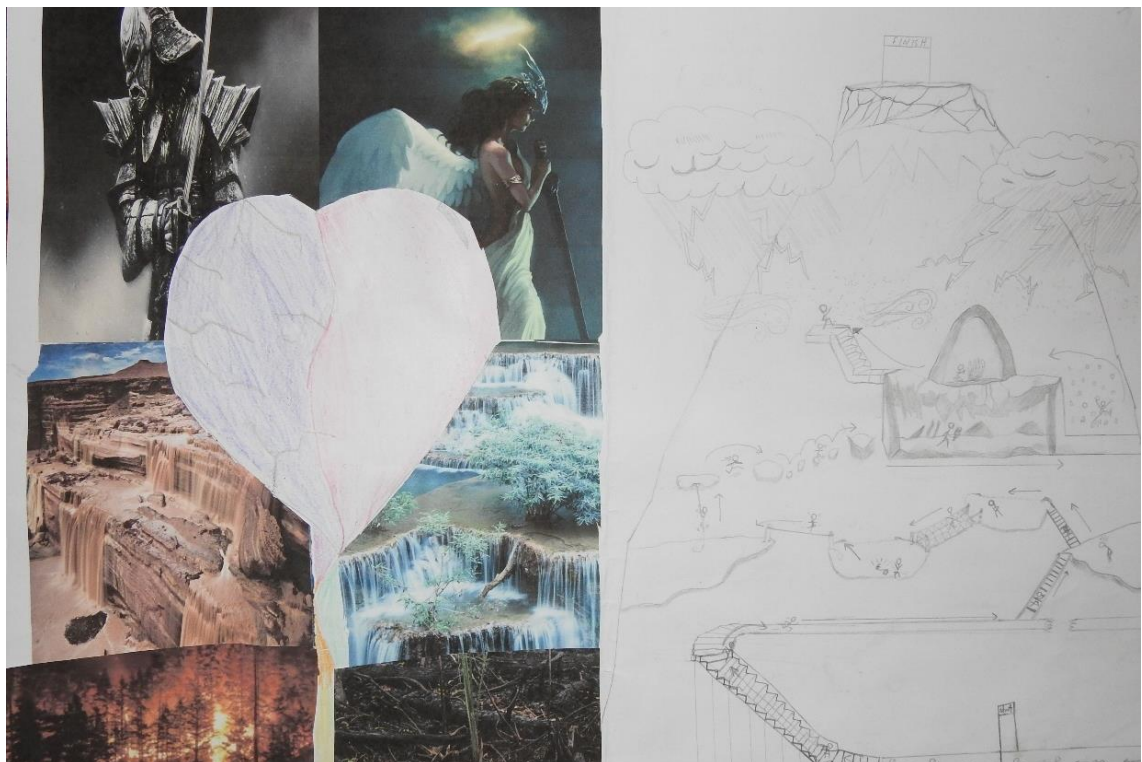
Note: By AUT005, 2019, collage, mixed media

World in the Future (opened out)



Note: By AUT005, 2019, collage, mixed media

World in the Present-day



Note: By AUT006, 2019, collage, mixed media



*World in the Future*



Note: By AUT007, 2019, collage, mixed media

*World in the Present-day*



Note: By AUT008, 2019, collage, mixed media



*World in the Future*



Note: By AUT009, 2019, collage, mixed media

*World in the Present-day*



Note: By Enved001, 2019, collage, mixed media

*World in the Future*



Note: By Enved001, 2019, collage, mixed media

*World in the Present-day*



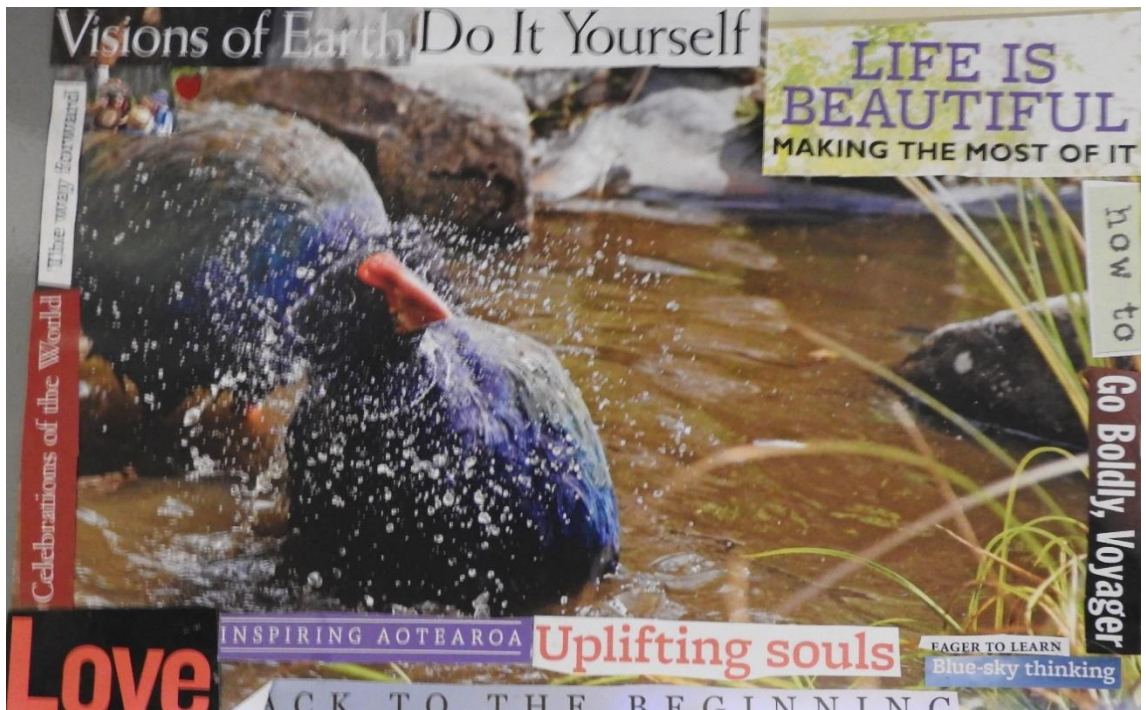
Note: By Enved002, 2019, collage, mixed media

*World in the Future*



Note: By Enved002, 2019, collage, mixed media

*World in the Present-day*



Note: By Enved003, 2019, collage, mixed media

*World in the Future*



Note: By Enved003, 2019, collage, mixed media

*World in the Present-day and the Future*



Note: By Con001, 2019, collage, mixed media

## Appendix E. Hope Scales and Survey

### Children's Future Scale



### Children's Future Scale

#### Directions

The six sentences below describe how you think about yourself and how you do things in general. Read each sentence carefully. For each sentence, please think about how you are in most situations. Place a tick inside the circle that describes *you* best. For example, place a tick (✓) in the circle (○) above “None of the time”, if this describes you. Or, if you are this way “All of the time”, tick this circle. Please answer every question by putting a tick in one of the circles. There are no right or wrong answers.

1. I think I am doing pretty well.

None of        A little of        Some of        A lot of        Most of        All of  
the time        the time        the time        the time        the time        the time

2. I can think of many ways to get the things in life that are most important to me.

None of        A little of        Some of        A lot of        Most of        All of  
the time        the time        the time        the time        the time        the time

3. I am doing just as well as other kids my age.

None of        A little of        Some of        A lot of        Most of        All of  
the time        the time        the time        the time        the time        the time

4. When I have a problem, I can come up with lots of ways to solve it.

None of        A little of        Some of        A lot of        Most of        All of  
the time        the time        the time        the time        the time        the time

5. I think the things I have done in the past will help me in the future.
- 
- None of the time    A little of the time    Some of the time    A lot of the time    Most of the time    All of the time
6. Even when others want to quit, I know that I can find ways to solve the problem.
- 
- None of the time    A little of the time    Some of the time    A lot of the time    Most of the time    All of the time

**Scales reprinted with permission.**

Snyder, C. D., Harris, C., Anderson, J. R., Holleran, S. A., Irving, L. M., Sigmons, S. T., & Yoshinou, L. (1991). The will and the ways: Development and validation of an individual-differences measure of hope. *Journal of Personality and Social Psychology*, 60(4), 570-585.  
<https://doi.org/10.1037/0022-3514.60.4.570>

Snyder, C. D., Hoza, B., Pelham, W., Rapoff, M., Ware, L., Danovsky, M., Highberger, L., Rubinstein, H., Stahl, K. (1997). The development and validation of the Children's Hope Scale. *Journal of Pediatric Psychology*, 22, 399-421.

## Adult State Hope Scale



### Adult State Hope Scale

Time

Date

#### Directions

Read each item carefully. Using the scale shown below, please select the term that best describes *how you think about yourself right now* and tick the circle above that term. Please take a few moments to focus on yourself and what is going on in *your life at this moment*. Once you have this “here and now” set, go ahead and answer each item.

1. If I should find myself in a jam, I could think of many ways to get out of it.

Definitely false Mostly false Somewhat false Slightly false Slightly true Somewhat true Mostly true Definitely true

2. At the present time, I am energetically pursuing my goals.

Definitely false Mostly false Somewhat false Slightly false Slightly true Somewhat true Mostly true Definitely true

3. There are lots of ways around any problems that I am facing right now.

Definitely false Mostly false Somewhat false Slightly false Slightly true Somewhat true Mostly true Definitely true

4. Right now, I see myself as being pretty successful.

Definitely false Mostly false Somewhat false Slightly false Slightly true Somewhat true Mostly true Definitely true

5. I can think of many ways to reach my current goals.

Definitely false Mostly false Somewhat false Slightly false Slightly true Somewhat true Mostly true Definitely true

6. At this time, I am meeting the goals I have set for myself.

Definitely false Mostly false Somewhat false Slightly false Slightly true Somewhat true Mostly true Definitely true

#### Scale reprinted with permission.

Snyder, C. R., Sympson, S. C., Ybasco, F. C., Borders, T. F., Babyak, M. A., & Higgins, R. L. (1996). Development and validation of the State Hope Scale. *Journal of Personality and Social Psychology*, 70, 321-335, <https://doi.org/10.1037/0022-3514.70.2.321>.

## Hopefulness and Conservation Action Survey

The survey comprises the Adult State Hope Scale, conservation attitudes developed from collage-elicited themes, and conservation action type and frequency questions.

### Introduction

KIA ORA! WELCOME!

Thank you for taking the time to complete this Hopefulness and Conservation Action Survey. *By completing this survey you are indicating your consent to participate in this research.* Your responses will remain confidential at all times, and are for the exclusive use of Helen Ough Dealy, a Department of Conservation staff member and doctoral candidate at Auckland University of Technology (AUT).

Sharing your thoughts about hope and conservation action with us is invaluable for the future work around environmental education and community conservation volunteering. We hope you find the survey interesting and enjoyable.

This survey was approved by the Auckland University of Technology Ethics Committee (AUTEK) on 5 November 2019, AUTEK Reference number 18/406.

Hope scale reprinted with permission. Snyder, C. R., Sympson, S. C., Ybasco, F. C., Borders, T. F., Babyak, M. A., & Higgins, R. L. (1996). Development and validation of the State Hope Scale. *Journal of Personality and Social Psychology*, 70, 321-335.

The whole survey should take about 8 minutes to complete.

TO TAKE PART IN THIS SURVEY: Please read and confirm you have understood the following:

- I am 20 years or over.
- I have read and understood the information provided about this research project.
- I understand that taking part in this study is voluntary (my choice).
- I understand that I may withdraw from the study at any time before submitting the completed survey on the final page.

Q1.

Read each item carefully. Using the scale shown below, please select the term that best describes *how you think about yourself right now* and tick the circle above that term.

Please take a few moments to focus on yourself and what is going on in *your life at this moment*. Once you have this “here and now” set, go ahead and answer each item.

	Definitely false	Mostly false	Somewhat false	Slightly false	Slightly true	Somewhat true	Mostly true	Definitely true
If I should find myself in a difficult situation, I could think of many ways to get out of it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
At the present time, I am energetically pursuing my goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are lots of ways around any problems that I am facing right now.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Right now, I see myself as being pretty successful.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can think of many ways to reach my current goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
At this time, I am meeting the goals I have set for myself.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q2.

Read each item carefully. Using the scale shown below, please select the term that best describes what *you think right now* and choose the circle below that term. Please take a few moments to focus on yourself and what is going on in *your life at this moment*. Once you have this “here and now” set, go ahead and answer each item.

	Definitely false	Mostly false	Somewhat false	Slightly false	Slightly true	Somewhat true	Mostly true	Definitely true
I feel connected to the natural world.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel connected to other people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The actions of individuals are important for the future of the natural world.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The actions of groups are important for the future of the natural world.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am committed to looking after the natural world.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Looking after the natural world takes effort.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is always more to learn about the natural world.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can help others learn about the natural world.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believe that nature will heal itself.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Definitely false	Mostly false	Somewhat false	Slightly false	Slightly true	Somewhat true	Mostly true	Definitely true
I believe nature needs our help to heal.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believe that science and technology are important for finding solutions to future problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believe teamwork and collaboration are important for finding solutions to future problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q3.

What conservation actions are you involved with currently?

---

*(Open field for survey participant to type in own choice of words)*

Q4.

How often do you carry out these conservation actions? *Please choose the options that suit you best:*

	Weekly	Monthly	Once a year	Less than once a year	Never	Other
Planting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Weeding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Controlling pests	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q5.

What conservation actions do you intend carrying out in the future?

---

*(Open field for survey participant to type in own choice of words)*

Q6.

When, in the future, will you carry out these conservation actions? *Please choose the options that suit you best.*

	Next year	In 5 years	In 10 years	Never	Other
Planting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Weeding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Controlling pests)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

In this section, please tell us a little about yourself.

Q7.

Where do you live most of the time? *Please choose one of the following.*

- Bay of Islands
- Other places in New Zealand
- Overseas

Q8.

How old are you?

- 20-24
- 25-29
- 30-34
- 35-39
- 40-44
- 45-49
- 50-54
- 55-59
- 60-64
- 65-69
- 70-74
- 75-79
- 80-84
- 85+
- Prefer not to disclose

Q9.

What is your gender?

- Male
- Female
- Other (please specify) \_\_\_\_\_

*(Open field for survey participant to type in own choice of words)*

- Prefer not to disclose

Q10 What is your ethnicity? *Please choose one of the following:*

- NZ Māori
  - NZ Pākehā (European)
  - Pasifika
  - European
  - Asian
  - Middle Eastern/Latin American/African
  - Other. Please describe if you wish.
- 

*(Open field for survey participant to type in own choice of words)*

- Prefer not to disclose

Q11 How would you rate your **spoken** ability in te reo (Māori)? *Please choose one of the terms below:*

- Te reo is part of my culture and identity
- Fluent speaker
- Basic conversation
- Some spoken words
- None
- Prefer not to disclose

Q12 How would you rate your **reading** ability in te reo (Māori)? *Please choose one of the terms below:*

- Te reo is part of my culture and identity
- Fluent reader
- Basic reading
- Some written words
- None
- Prefer not to disclose

## Appendix F. Survey Participant Demographics

Participant demographics for the survey completed in Appendix D (n=243)

Category	Response	Participants	
		Number of participants	Percentage of total participants (%)
<b>Gender</b>	Female	108	44
	Male	132	54
	Other	1	<1
	Prefer not to disclose	2	<1
<b>Age</b>	20-24	60	25
	25-29	50	21
	30-34	36	15
	35-39	13	5
	40-44	23	9
	45-49	21	9
	50-54	14	6
	55-59	8	3
	60-64	11	5
	65-69	2	<1
	70-74	2	<1
	75-79	1	<1
80-84	0	0	
<b>Ethnicity</b>	NZ Māori	28	12
	NZ Pākehā (European)	154	63
	Pasifika	27	11
	European	8	3
	Asian	6	3
	Middle Eastern/Latin American/African	3	1
	Other	16	7
	Prefer not to disclose	3	1

## Appendix G. Collage materials

*Example of Box Containing Collage Materials Given to Each Study Participant*

