Blue and Green resilience in Abberley Park

A mixed methods and co-designed approach to foster community participation and youth leadership for environmental stewardship in St Albans, Ōtautahi Christchurch

A GEOG402 Resilient Cities research project

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1. Executive Summary

Creeks, streams, and waterways have historically been a critical part of community identity, community stewardship, blue-green infrastructure, and local environments. However, as cities and urban settings have continued to grow, the awareness and cultural significance of waterways has been challenged, particularly for youth. In partnership with the St Albans Residents Association (SARA), this study focuses on the creek in Abberley Park. The research aims to support efforts to raise the profile and social significance of the creek, and its role in supporting the resilience of our local waterways.

Using a mixed method approach this research uses semi-structured interviews and a community survey to understand community perceptions of the park and creek, an assessment of the water quality and literature study that aims to identify the foundational perspectives of youth stewardship through the lenses of public education and mātauranga Māori (traditional knowledge of Māori). The close relationship held with the community partner allowed for a strong level of feedback and collaboration that helped shape the methodology.

The analysis showed that gaining insight into youth perspectives is a significant challenge. Perceptions of the park are positive, with strong awareness of the creek and mixed perceptions around the level of maintenance and water quality of the creek. The recommendations aim to support SARA's future research and projects to implement their strategy towards social and urban regeneration.

2. Introduction

2.1. Background

The focus of this research is Abberley Park, in St Albans, situated north of the Central Business District in Ōtautahi Christchurch. The location of the park is identified in Figure 1 Map of St Albans suburb . Abberley Park is a Council owned public park that is recognised for its social and historical significance and is one of eight heritage parks across Ōtautahi Christchurch. Named after the village of Abberley in Worcestershire, England, the area

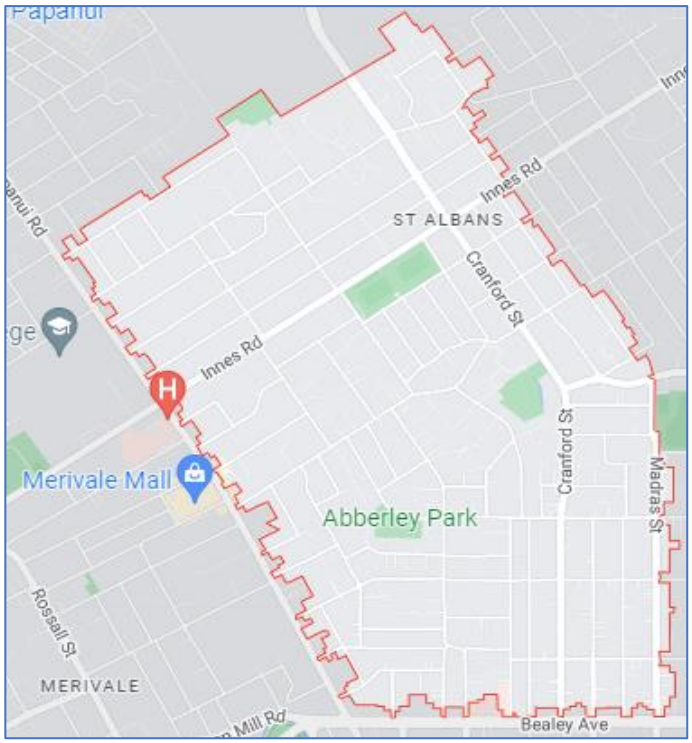

Figure 1 Map of St Albans suburb (Google, n.d.)

was established as a family residence in 1864 before being purchased by the Council and opened as Abberley Park in 1940 as part of the city's centennial celebrations. (Christchurch City Council, 2015). A commemorative plaque is displayed near the Abberley Park Hall inside the Park (Figure 2).

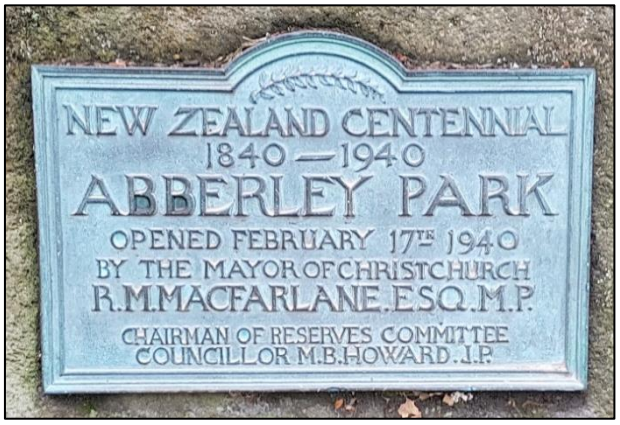

Figure 2 Abberley Park commemorative plaque

Abberley Park offers a wide range of amenities, including a Council-run community hall, playground, paddling pool, picnic areas, outdoor spaces that can be booked out for private events and a scented garden, which supports the visually impaired members of Blind Low Vision NZ who are based close to the park. Another key feature of the park is St Albans Creek, which flows both through the park and many private residences throughout St Albans, Edgeware, and Shirley. The Creek then acts as a tributary for Dudley Creek and further downstream contributing to the Ōtākaro Avon River. Figure 3 is a copy of the map currently displayed in the park, highlighting the key features.

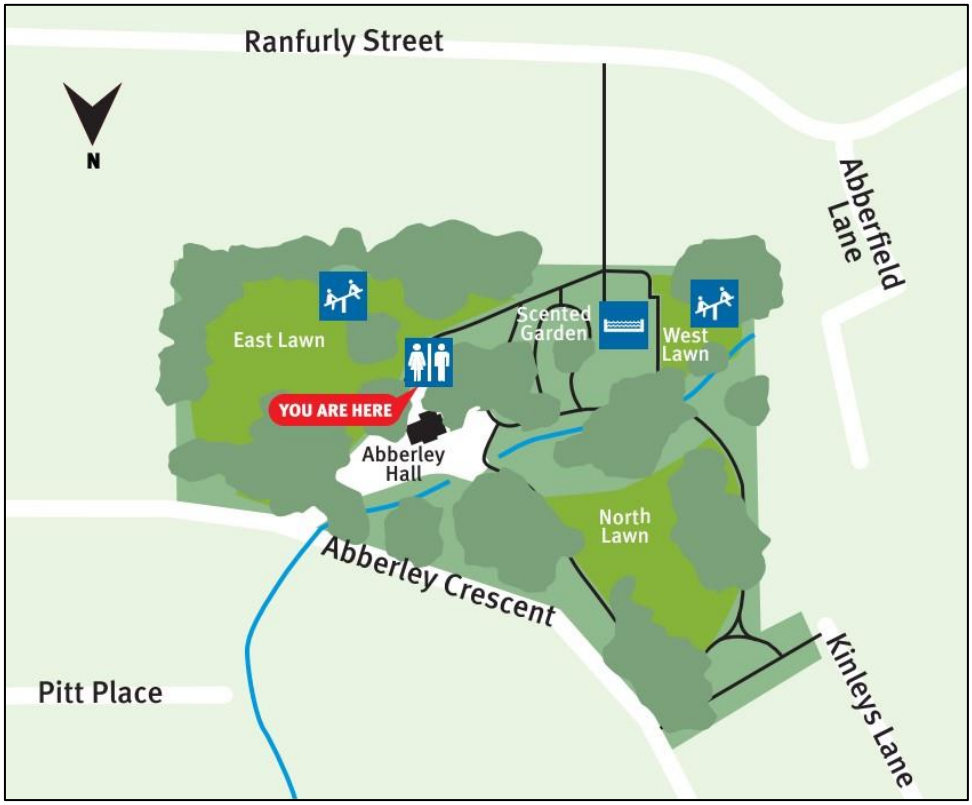

Figure 3 Map of Abberley Park public amenities, connections and waterway (Christchurch City Council, n.d.)

2.2. Community Partners

The St Albans Residents Association (SARA) is our community partner represented by Emma Twaddle and Shamani Gill. SARA is a well-established community organisation that was founded in 1989. SARA operate strategically as an umbrella organisation with advocacy connections to the Waimāero Fendalton-Waimairi-Harewood Community Board, Christchurch City Council, and Environment Canterbury. SARA also operates and manages the Kohinga St Albans Community Centre near the park.

2.3. Research Problem

St Albans is a historic community of interest in Ōtautahi Christchurch and residents want a strong, connected, inclusive neighbourhood that retains and maintains the character and history of St Albans as a distinct suburb and with a unique identity (St Albans Residents Association, n.d.). Emma and Shamani emphasised this during our onsite meeting, where we discussed St Albans Creek and its lack of recognition in local information and online maps (Figure 4). Emma and Shamani raised concerns that a lack of recognition of the creek would hinder resilience focussed projects on the blue and green infrastructure in the area. SARA recognise the need for community stewardship in St Albans, which is supported by the Friends of Abberley Park, a small community group who befriend the park and its living creatures. However, despite a strong youth population in the community, there are difficulties engaging with the youth sector which impacts on representation in environmental initiatives in St Albans, and more broadly in the city. This is further restricted by the lack of high schools in the area. To combat this, the community partners introduced us to Liam Speechley, a 16-year-old pupil from St Bede's College who is seeking experience in a geography-related project as part of his schoolwork and wanted to assist in this project.

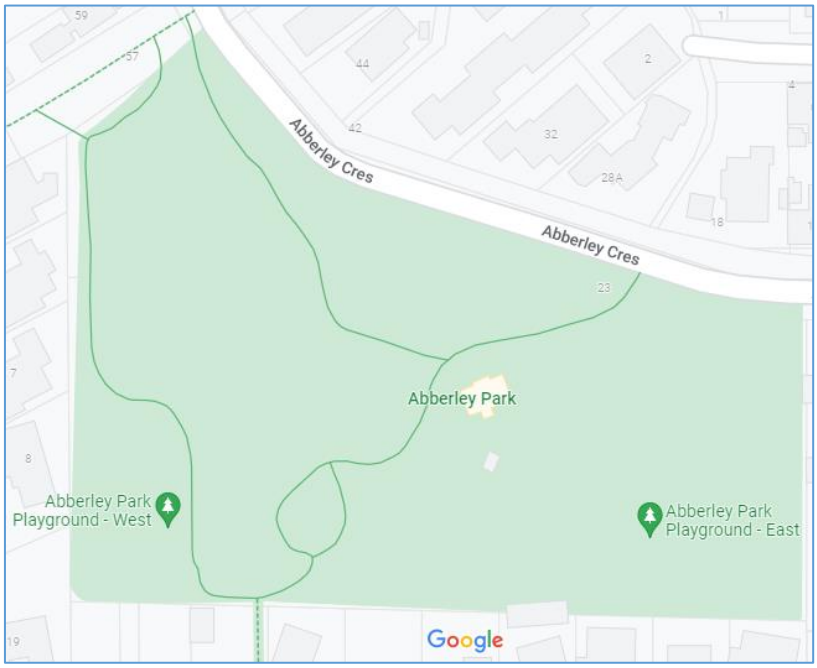

Figure 4 Google Maps Abberley Park (Google, n.d.)

2.4. Research aim, objective, questions and scope

Research aim - This research aims to identify opportunities to increase community awareness of St Albans Creek and its contribution to the Ōtautahi Christchurch waterways network and Ōtākaro Avon River Corridor to support blue-green resilience in the St Albans

area. Following discussion and feedback from the community partner we further refined this research to also understand the potential for youth stewardship and in recognition of blue and green infrastructure. Blue infrastructure, such as waterways, wetlands, or floodplains and green infrastructure, such as trees, forests and parks, requires more awareness and participation of all generations together.

Research objective - Identify opportunities to increase community awareness of St Albans Creek and its contribution to the Ōtautahi Christchurch waterways network and Ōtākaro Avon River Corridor.

Research questions

1. What is the level of the community awareness, particularly in the youth sector, of the St Albans Creek within Abberley Park?

2. Do the community perceptions of the water quality of the creek reflect the actual health of the creek?

3. What are the challenges of gaining youth participation in sustainability initiatives?

Research scope - Our work focussed on Abberley Park, St Albans Creek, the residents of St Albans and visitors to the park.

3. Literature Review

3.1 Introduction

In partnership with St Albans Residents Association (SARA), this project investigates how to raise the profile, and knowledge of the St Albans Creek within the St Albans community. As a part of this investigation, a literature review into how youth stewardship for the St Albans creek can be established has been identified as vital to support the research partner. This literature review seeks to understand sustainability perspectives on how youth stewardship can be enhanced for local waterways. This literature review will touch on three major areas: youth perspectives, public education perspectives, and the mātauranga Māori perspectives of environmental stewardship.

3.2 Defining youth

Before seeking insight into the perspectives that youth have in relation to the environment and stewardship, a definition of 'youth' is required. When youth is used throughout the literature, it refers to young people who fall between the ages of 15 and 24; those below 14 are classified as children (United Nations, 2003, p. 2). It should be acknowledged that different counties have different definitions of youths and or children; in the Aotearoa New Zealand context for example, the Children's act 2014 defines a child as any person who falls below the age of 17-years-old (Childrens Act, 2014). As a result of the Children's Act, youth in New Zealand are classified as those between the ages of 18 and 24; this differs from the common definition used in the literature (Child and Youth Wellbeing New Zealand, 2019). For this literature review, any recommendations around youth stewardship will refer to this culturally situated definition of youth.

3.3 Understanding youth perspectives on the environment

Whilst searching for literature that outlines youth perspectives on the environment and environmental stewardship, it quickly became apparent that this is an area where little investigation and research has been undertaken. Interestingly, in their introduction to *Youth Views on Environmental Changes, the Future of the Environment, and Stewardship*

(2011), Hood, Martin, McLaren, and Jackson outline that they are attempting to fill this void. However, they state that the void they are trying to fill relates purely to rural youth perspectives, despite the lack of recognition of urban youth perspectives (Hood, Martin, Mclaren, & Jackson, 2011, p. 617). In any case, Hood, Martin, McLaren, and Jackson suggest that young people in society will forcefully inherit the future of sustainability and climate challenges. The challenges that youth faces are broadly accepted and outlined in chapter five of the United Nations World Youth Report (2003), which heavily influenced Hood, Martin, McLaren, and Jacksons' work (Hood, Martin, Mclaren, & Jackson, 2011, p. 617). There appears to be consensus across the literature towards the youth of the world will continue to shoulder the environmental and ecological challenges in the world continue to grow as greenhouse emissions drive climate change (Gallay, Pykett, Smallwood, & Flanagan, 2020, p. 2; United Nations, 2003, pp. 2-5). As such, it is suggested that youth from across the global community should actively contribute to natural resource stewardship and sustainability (Hood, Martin, Mclaren, & Jackson, 2011, p. 617; United Nations, 2003, p. 131). However, youth cannot do this alone, and youth leaders within the community will need to be supported in facing the challenging situation that they are unfairly inheriting.

However, whilst this apparent consensus suggested, Hood, Martin, McLaren, and Jackson highlight what the environment tangibly means to youth, nor does the literature to date capture their feelings on the environmental and ecological responsibilities they are inheriting (Hood, Martin, Mclaren, & Jackson, 2011, p. 617). To bridge this gap, Hood, Martin, McLaren, and Jackson researched the youth's perspectives on the issues they were inheriting and their perspectives on the environment. Hood, Martin, McLaren, and Jackson carried out two semi-structured focus group sessions with fourteen participants aged between 17-and 24 (Hood, Martin, Mclaren, & Jackson, 2011, p. 618). The groups interviewed were from a rural fishing community in Canada; the community was chosen due to its unique experience with economic, political, and ecological collapse following the destruction of the codfish population in the area (Hood, Martin, Mclaren, & Jackson, 2011, p. 617).

The investigation results from Hood, Martin, McLaren, and Jackson revealed that the youth who participated place significant value on their local environment and its local resources (Hood, Martin, Mclaren, & Jackson, 2011, p. 622). However, despite the value they placed on the environment, the collective feeling of the youth in the study area was that their perspectives were not considered in the town's decision-making process or the decision-makers (Hood, Martin, Mclaren, & Jackson, 2011, p. 622). Beyond this, the youth who participated in the study felt that there were no opportunities that enabled them to engage in impacting the town's ecological and environmental health (Hood, Martin, Mclaren, & Jackson, 2011, pp. 622-623). This was particularly frustrating to those youth in the study as many of their families had suffered finically from the collapse of the cod population.

Whilst the youth community involved in the study appeared to be hyper-informed on the consequences of ecological disasters, a criticism of using this group for research is that they do not represent the general experience of youth. This criticism is based on the data that outlines 55% of the global population lives in urban environments as opposed to rural; and that a large proportion of the population has not yet experienced the impacts of a collapsed ecosystem (United Nations Department of Economic and Social Affairs, 2018). Whilst Hood, Martin, McLaren, and Jackson research accounts for the rural youth perspective and admittedly are attempting to fill the rural void, the lack of urban youth representation in the literature is still problematic (Hood, Martin, Mclaren, & Jackson, 2011, p. 617). In suggesting this criticism, it must be noted that there appears to be no generic

definition of youth as a group that encompasses cultural variations and perspectives, be they western or indigenous; as previously defined, youth generally is constrained to referring to a specific age bracket. There is the potential for opportunity in this space for a youth led collaborative definition of youth to be established amongst key stakeholders in the St Albans community that more broadly represents their thoughts, feelings, and perspectives.

3.4 The Public Education Perspective of Youth Stewardship

In contrast to the perspective of the investigation carried out by Hood, Martin, McLaren, and Jackson that assumes that youth have a perspective on the environment and the challenges of environmental degradation, the public education perspective does not. Instead, the public education perspective suggests that the current generation must foster a sense of stewardship for the environment (Gallay, Pykett, Smallwood, & Flanagan, 2020, p. 2).

Gallay, Pykett, Smallwood, & Flanagan outline in *Urban youth-preserving the environmental commons: student learning in place-based stewardship education as citizen scientists* (2020) that place-based stewardship education (PBSE) may be the best method for fostering stewardship in youth. Gallay, Pykett, Smallwood, & Flanagan define PBSE as an educational philosophy that focuses on the value of an educational experience within a 'local place' beyond education facilities i.e. in a park near a school, as opposed to green spaces within the school (Gallay, Pykett, Smallwood, & Flanagan, 2020, p. 3). Furthermore, the educational experience should have a focus on encouraging youth to observe, identify, and engage in solutions for environmental problems within the place as a means of fostering their stewardship of and connection to the place (Gallay, Pykett, Smallwood, & Flanagan, 2020, p. 3). From the above principles, Gallay, Pykett, Smallwood, & Flanagan investigated what core principles of stewardship youth came away with after the education experience; for their study, youth were categorised as 10-year-olds to 18-year-olds. This appears to highlight a tendency across the literature to defining the opinion of youth, as opposed to seeking them out or enabling youth autonomy in how they are defined and perceived.

The education experience that the youth participated in was over the course of a year. The experience had the students educated on the value of a local place and experience the natural environment of that place (Hood, Martin, Mclaren, & Jackson, 2011, p. 3). The youth were then educated in principles of civic engagement and the science behind environmental management; this part of the education framework was designed to enable the students to engage in the civic processes around environment management actively and equip them with the appropriate scientific knowledge (Gallay, Pykett, Smallwood, & Flanagan, 2020, pp. 3-4). From this foundation, the youth were then encouraged to engage in solving a problem in the local community that was tied to the local place and then write about their experiences; from these writings, an assessment of learnt principles was undertaken (Gallay, Pykett, Smallwood, & Flanagan, 2020, p. 3).

Following the PBSE learning, 57% of the youth identified that they and wider humanity played a role in preserving the quality of waterways and streams and reducing their impact on the natural environment (Gallay, Pykett, Smallwood, & Flanagan, 2020, p. 4). Furthermore, 57% of youth tied their actions to helping their community and fostering a desire to do more for the good of their neighbourhoods (Gallay, Pykett, Smallwood, & Flanagan, 2020, p. 4). Beyond the purely human aspects of waterway management, 42% of the youth referenced the importance of the environment surrounding waterways following the PBSE (Gallay, Pykett, Smallwood, & Flanagan, 2020). The youth

demonstrated a holistic understanding of maintaining the waterways for themselves, their families, and the human and non-human environments (Gallay, Pykett, Smallwood, & Flanagan, 2020, pp. 4-5).

Whilst the investigation by Gallay, Pykett, Smallwood, & Flanagan implies that the youth involved are gaining a greater understanding of stewardship and their role in caring for the local community and environment, the validity of this outcome is difficult to ascertain. No baseline measurement of the youth's understanding was undertaken as apart of this research and this makes it difficult to identify to what extent the students already understood these issues. However, when working from the assumption of the public education perspective that youth have no prior understanding of environmental stewardship (as established at the start of this section), the results do imply an improved sense of stewardship amongst youth. However, a more rigorous initial foundation would increase confidence in this space. Beyond the investigation results by Gallay, Pykett, Smallwood, & Flanagan is the question of civic engagement.

The idea of civic engagement and stewardship through citizenship is prevalent throughout the public education perspective. BM Hayward outlines in an Editorial piece *Civics, Citizenship, and Political Literacy* (2016) that despite the commonality of these ideas in the literature, there is rarely a commonality of a definition in the usage of these terms. It appears that with each investigation or research report, there is a tendency for the academics to establish their definition instead of using one that fits a standardised or normative definition (Hayward, 2016, p. 1). The inconsistent use of terminology is not unique to these terms, as the differences in the use and meaning of 'youth' suggests. Rather this indicates that the context in which the term is being used is important to establish. In the Aotearoa, New Zealand Context, citizen and civics engagement challenges are inexplicably linked to the Treaty of Waitangi and the ongoing tension around Māori citizenship (Hayward, 2016, p. 1).

3.5 Māori Perspectives of Youth Stewardship

When providing a summary of the available literature on Māori perspectives on youth stewardship, it must be acknowledged that it is likely that not all the cultural intricoes and perspectives have been captured. Nonetheless, when reviewing the available literature, a central perspective emerged, that of mātauranga Māori. Marques, Freeman, Carter, & Pedersen Zari's work C*onceptualising Therapeutic Environments through Culture, Indigenous Knowledge and Landscape for Health and Well-Being* (2020) outlines the core principles of mātauranga Māori (Māori knowledge) concerning stewardship of the environment. mātauranga Māori, as a form of indigenous knowledge, is the system of oral tradition, customs, and practices that is comprised of four key pillars, the spiritual realm, natural realm, self, and nature (Marques, Freeman, Carter, & Pedersen Zari, 2020, p. 2).

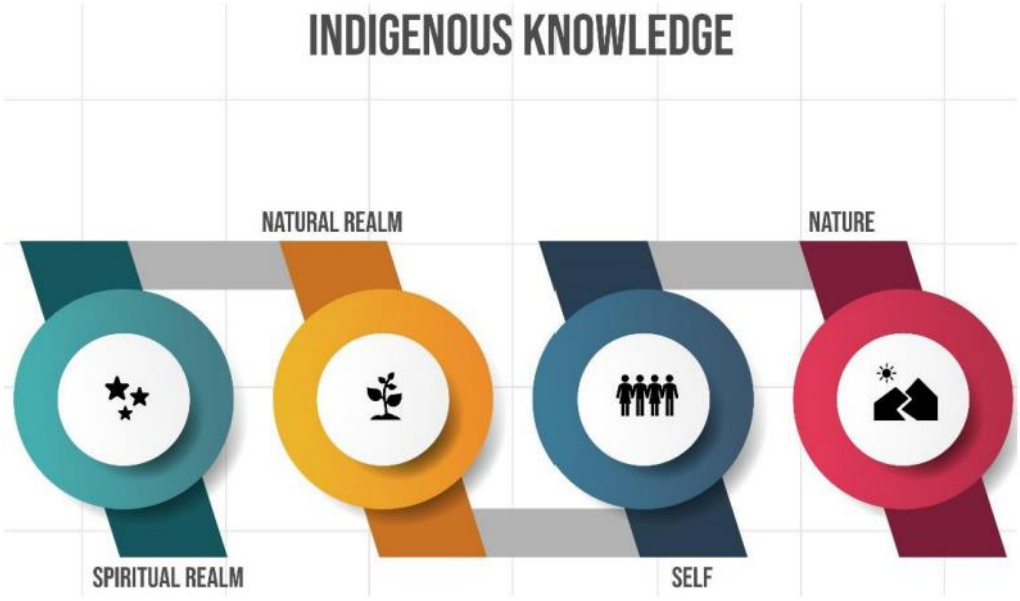

Figure 5 Fundamental aspects of Indigenous knowledge bringing together the spiritual, the natural and the self

The four pillars of indigenous knowledge strongly connect to the unity between society and the land and the feedback loop between both areas, with each influencing the other (Marques, Freeman, Carter, & Pedersen Zari, 2020, p. 3). As a result, the environment and land represent not only a resource or commodity but also a place of guidance, knowledge, collective identity, well-being, and genealogy, with the land itself and elements of the environment often being personified or established as key cultural talismans (Marques, Freeman, Carter, & Pedersen Zari, 2020, p. 3). From this perspective, the importance of caring for and tending to the environment and fostering a sense of stewardship for these elements are built into the cultural teachings of the mātauranga Māori perspective, as the land and culture are intertwined (Marques, Freeman, Carter, & Pedersen Zari, 2020). As a result, mātauranga Māori views the problem of environmental degradation more holistically as a cultural, ecological, and sociological issue; this is markedly different from the perspective that has been outlined thus far (Marques, Freeman, Carter, & Pedersen Zari, 2020, p. 3).

It should be acknowledged that the mātauranga Māori perspective is not solely focused on youth; instead, as a part of the oral tradition, it could be argued that it is closely linked to the public education perspective, as the tradition is passed through generations from elders to youth (Marques, Freeman, Carter, & Pedersen Zari, 2020, pp. 2-3). Across the literature, there is a broad acceptance of the importance of indigenous forms of knowledge and the role that they will play in the future of environmental management and stewardship. This is particularly significant in the New Zealand context as the Treaty of Waitangi is the country's statutory constituent document, and the rights, perspectives, and knowledge of Māori must be a part of the country's response to the climate challenges we all face. The acceptance of the principles of indigenous knowledge principles at the academic and policy level dates back to the fourth Intergovernmental Panel on Climate Change (IPCC) Report (2007).

4. Methodology

This research project employs a mixed-methods approach with a literature review, community survey, and assessment of the health of the St Albans Creek (Table 1). Mixed methods approaches are proven to be effective as a way of mixing qualitative and quantitative methods to gain an understanding beyond that of any single approach

(Bazeley, 2017;2018). In this context, quantitative data was collected to gain an understanding on the ecology of the park and its creek. Qualitative data was also collected through a community survey and in person interviews to understand perceptions of the park held by the public. These combined results allowed a more holistic picture to be painted from several perspectives both subjectively and objectively.

Table 1 Overview of Research Methods

	Purpose	Data Source	Methods
Youth Stewardship	To identify the current state of youth engagement and where there could be improvements	Literature review	Literature review
Community perceptions	Identify community perceptions of Abberley Park and St Albans Creek	• Local residents • Visitors to the park	• Online survey • Semi-structure interviews
Health of the creek	To quantify the creeks health and see if it matches the publics perceptions	Primary data collection from creek	Collecting and analysing samples from the creek

4.1 Community survey

The survey is focussed on community perceptions of Abberley Park and St Albans Creek. Survey participants have a connection to Abberley Park as either a local resident or visitor to the park.

Potential participants were recruited via several methods. Firstly, an article promoting the online survey was published in the May 2022 edition of the St Albans News community newsletter, available online[1] and a printed copy was delivered to each home in the St Albans community as part of the normal distribution of the newsletter. The same article was also shared through social media to the St Albans community through the SARA[2] and Friends of Abberley Park[3] Facebook pages. Our community partner emailed the link to their community stakeholders contact list. The online survey included clear information on the purpose, process and how the information will be used. A copy of the questions is included in **Appendix A: Community survey** questions**.**

Secondly, the research team visited Abberley Park on 7 May 2022; seeking visitors to the park who would be willing to participate in the same survey in a face-to-face interview format. Two members of the team conducted the interviews with supervisory observation. An information sheet was available to the participant detailing the purpose of the survey and their involvement. Each participant gave their consent verbally which was audio recorded as part of the interview. It is recognised that one of the participants was known to the research team which may introduce some bias; however, the participant is both a local resident and frequent visitor to the park that the research team felt made a strong contribution to the research.

[1] St Albans News https://stalbans.gen.nz/
[2] St Albans Residents Association Facebook page https://www.facebook.com/SARA.StAlbans
[3] Friends of Abberley Park Facebook page https://www.facebook.com/Friends-of-Abberley-Park-1067633789987213

To support the analysis and interpretation of the survey results, responses for questions 5, 8 and 9 have been categorised as positive, neutral, negative or don't know (Table 2) and represented using a traffic light colour scheme in Figure 10.

Table 2 Categorisation of survey responses

Positive		Neutral	Negative		Don't know
Very high	High	Satisfactory	Poor	Very Poor	Don't know

4.2 Health assessment of St Albans Creek

Part of the mixed methods approach was primary data collection for an assessment of the health of the St Albans Creek in Abberley Park. This was done using a Macroinvertebrate Community Index (MCI). In order to do this, first a kick net sample was taken from three sites (Figure 6) to ensure that an accurate representation of the water and its species were taken. These three samples were collected from the downstream end of the creek and moved upstream with each sample. At each site the net was placed on the bed of the creek and then approximately one foot upstream of the net, the bed of the creek was kicked up using waders to make suspended sediments and invertebrates flow into the awaiting net. The contents of the nets were then deposited into plastic containers and preserved with ethanol to ensure the sample is not contaminated. As well as sampling invertebrates at each site, there were a series of measurements taken. These being conductivity, pH, and temperature. These measurements were taken using a standard probe which can measure all three variables. These measurements were taken to be used as supporting evidence for the creek's health, as these three variables determine the creek's ability to support life.

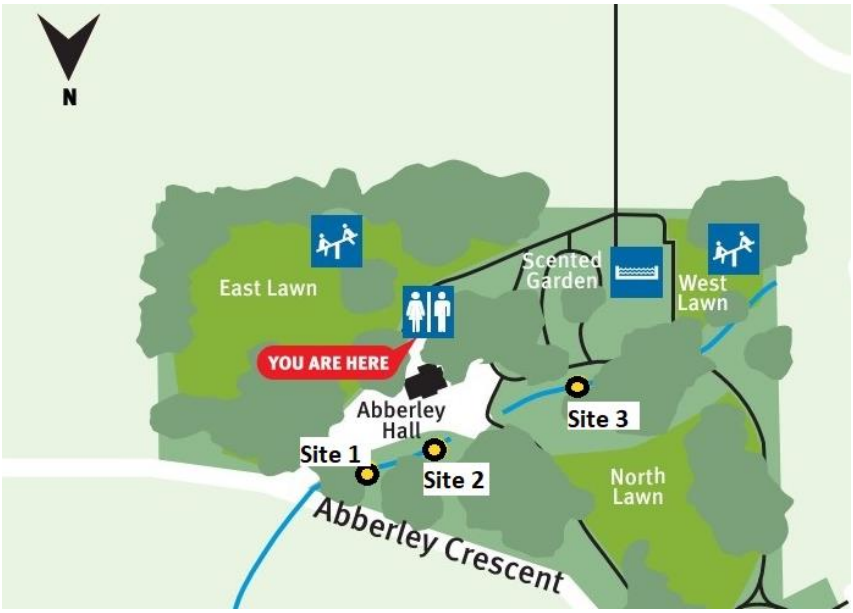

Figure 6 Locations for each sample taken from the creek

These samples were then taken to a lab, where they were filtered through a half millimetre and a 500-micron sieve to remove excess sediment and organic waste such as leaves. Then the filtered remains were emptied into a tray, which was then filled with water. From there individual specimens were identified by eye and removed from the tray to be observed under the microscope to make a list of species present in each site. With this list an MCI index was created, which rates each species between 1 and 10 to indicate how tolerant they are to pollution. Species that are rated on the higher ends of the scales are

incredibly sensitive to pollutants, while species on the lower end are very tolerant. What species are present, and especially what species are absent are the indicators of waterway health in this assessment.

4.3 Research limitations

One limitation for the MCI assessment was the lack of experience by the user, someone with more experience in the biological sciences might have been able to identify species like caddisflies which were missing from the data collected. This is backed up by a previous MCI index assessment undertaken by a professor in the biology department. The results from this assessment resulted in a slightly higher count of more diverse species. But still contained the same core species such as worms and snails (J. Harding, personal communication, May 9, 2022).

This research is limited in scope due to it being a partial requirement of the GEOG402 Resilient Cities course at the University of Canterbury. There are questions and areas of further investigation, which have arisen from the research; this research is a pilot to indicate key issues and directions for future research led by St Albans Residents Association.

5. Results and Discussion

5.1 Health Assessment of St Albans Creek

The creek had a high amount of sediment and mud smothering the bottom of the creek at all sites, but site two was the worst. The mud at this site was just shy of knee deep, which contributed to the lower diversity and higher temperature detected here. The quality of the water did not vary much between sites as being an urban creek, it is affected heavily by the anthropogenic forces and processes that surround it.

Table 3 Results of MCI Assessment at each site

	Score	Rating
Site 1	93	Average
Site 2	45	Poor
Site 3	84	Average

Table 3 indicates the results of the MCI Assessment. In these results the score is derived from species present, and the rating is the results of each score. None of the sampled sites had more than five species present. And of those five they were not high on the MCI scoring matrix. This indicates that there are high levels of pollution in the creek. The ratings derived from the MCI scores reflect this in Table 3. Scores below 100 indicate probable moderate pollution, while scores below 80 indicate probable severe pollution. Sites one and three show moderate pollution while site two has far more severe pollution.

Table 4 Conductivity and Temperature measurements taken at each site

	Site 1	Site 2	Site 3
pH	6.5	6.5	6.5
Conductivity (uS)	139	138	138.7
Temperature (°C)	15	16.2	15.6

The temperatures recorded were all within normal levels for an urban stream, indicating normal levels of oxygenation for invertebrates to survive (Table 4). Conductivity (measured

in microSiemens) can be used to measure how fresh vs saline the water is. A stream that has high conductivity can indicate proximity to the source underground. This is because water that has recently come from groundwater has high conductivity. In saying that, the measured conductivity was quite low. The detected pH measurements indicate that the water is neutral but ever so slightly acidic.

The species richness was low at each site but increased with distance upstream (Figure 7). This is likely due to the decreasing natural habitat as the creek progresses. The downstream end of the creek is more exposed to the human element as the surrounding gravel paths, and the nearby road increase the number of pollutants and foreign material that can enter the creek. Just past site 1 the creek funnels into a culvert which will again reduce the species richness as culverts as well as foreign materials and pollutants are well known in their ability to reduce invertebrate populations due to creating barriers and reducing habitat (Bernet, 2010).

Figure 7 Species richness moving upstream at each site

Figure 8 displays the result for all species detected. There are large amounts of freshwater worms which are a species with a high tolerance to pollution and low amounts of species such as Amphipods which are far more sensitive to water quality. This is the basis of how the MCI works, comparing the presence of species which are and are not tolerant to pollution as an indicator of the health of the assessed water body.

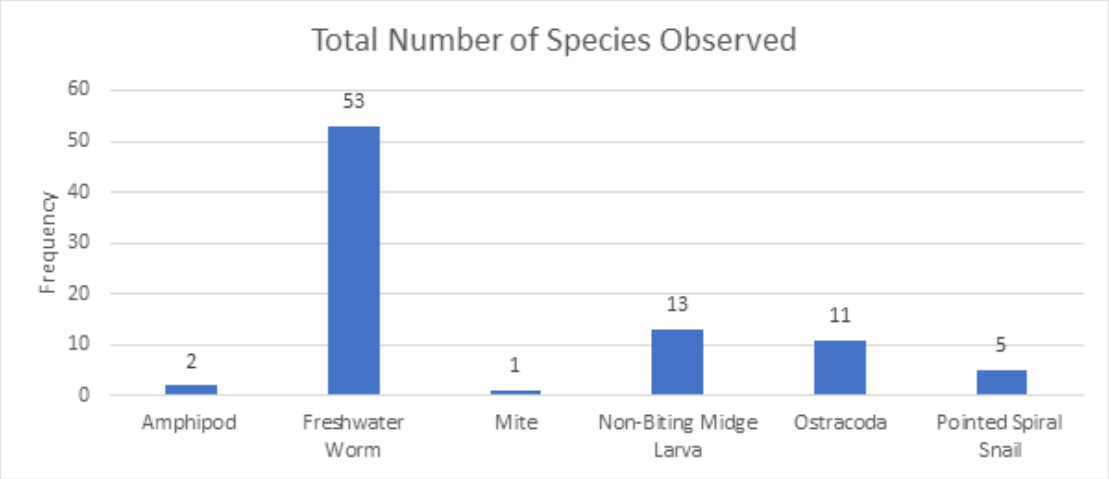

Figure 8 Number of species present at each site

5.2 Community Survey

Summary of respondents - 41 people completed the online survey. Demographic questions identified the majority of respondents are female (78.95%) and residents in the St Albans area (82.5%) aged 25 and over (94.75%) who regularly visit the Park (61.54%). Only two respondents identified in the age category '18 to 24'.

The park serves many community purposes with walking being the main activity, further identified as dog walking and the "Abberley Gang" of dog owners and their dogs. Respondents valued the park's location, quiet space and accessibility, along with the flower and fauna. The biodiversity of the park was recognised, including the Monarch butterflies (Figure 9), the native wildlife and the variety of trees.

Figure 9 Monarch butterfly winter cluster

In response to research question 1 regarding the level of community awareness of St Albans Creek, the community survey identified 89.74 percent of respondents had an awareness of the creek in Abberley Park but less than half (47.22%) were able to identify it as St Albans Creek.

Figure 10 provides an overview of three key areas of the survey:

- Maintenance of the park
- Maintenance of the creek
- Water quality of the creek

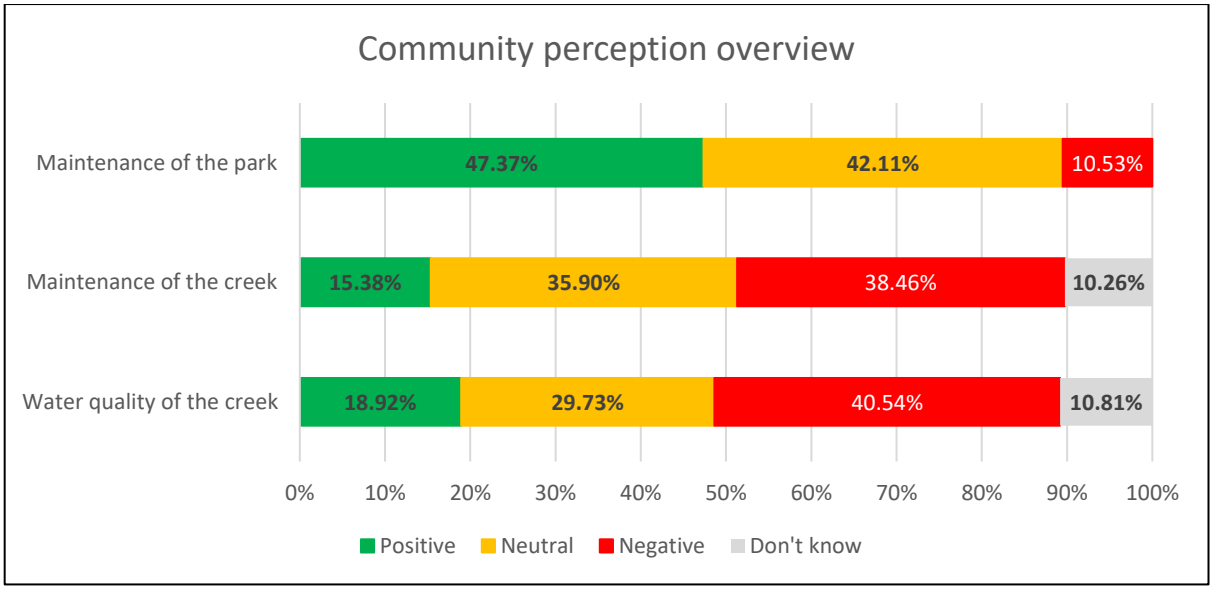

Figure 10 Community perception overview

The graph in Figure 10 highlights that community perception of the park was significantly more positive than the two questions related to the creek. All respondents were able to rate the maintenance of the park but not all respondents were able to answer the questions related to the maintenance and water quality of the creek.

Only 15.39 percent of respondents rated the maintenance of the creek positively with a further 35.9 percent giving a neutral rating giving a combined 51.29 percent. 38.46 percent of respondents rated the maintenance of the creek negatively and 10.26 percent were unable to rate the maintenance of the creek.

In response to research question 2: do the community perceptions of the water quality of the creek reflect the actual health of the creek? The online survey revealed that public opinion on the quality of the creek and its water recognises there is much room for improvement, which was validated by the MCI assessment that was performed. The survey revealed that 40.54 percent of people gave negative responses about the water quality with comments being made about the amount of mud, rubbish, and lack of habitat. The MCI assessment revealed that between the three sampled sites, the water quality ranged from moderate to severe levels of pollution. This can be accredited to the same reasons identified by the public, as mud, rubbish, and poor habitat are all major contributing factors for the low diversity of invertebrates identified in the creek.

- *"The creek could do with a really good upgrade both along its banks and under the water. The mud is deep in places and very unattractive. I'd like to see the creek flowing clean and clear over a substantial stony bottom."*
- *"My concern with the maintenance of the creek is more to do with the rubbish that gets thrown in by park users. We end up with paper plates (from picnics) and the like floating past us."*

There is something of a public understanding for the solutions to these issues however, the outcome of the MCI assessment highlighted that there is a substantial number of pollutants and foreign materials entering the creek and the public perception indicates an awareness of this. The public perception also indicates an awareness of the solutions to these issues, with one participant calling for more substantial riparian planting, and multiple others suggesting the need for dredging and improvement of the bed of the creek.

- *"June 2017 CCC spent weeks removing liquefaction from creek in response to complaints but north end has remained disgusting; suggest culvert near Hall needs blasting out. This is the only time it has been cleaned in last 11 years."*
- *"The only thing letting Abberley Park down is the quality of riparian planting along the creek"*
- *"I'd like to see the creek dredged a bit from time to time"*

Overall, the awareness of the creek was high and so was the awareness of the creek's issues. From what was gathered from the survey, there is a desire to see an increase in the quality of the creek with both its floor and banks, as well as improvement of water quality.

- *"The creek is an integral part of the community and really needs ongoing upkeep, love and attention. The banks need attention to ensure the added stability and integrity of both the bank and the creek. More education about stormwater effects is needed. It would be great to see the creek highlighted, made a feature of the park"*

5.3 Interviews

Five participants were interviewed. All identified as regular visitors to the park and have been regular visitors for several years.

Participant 1 commented on the change in community support towards flower and fauna in the park. In the early 1900's, exotic species from overseas were favoured but more recently there is growing support for planting of native species.

Dog walking was identified in the interviews as a key social activity. As dog owners both participants 1 and 2 were relatively positive of the water quality of the creek with either dogs entering or drinking water from the creek without adverse effects.

Participant 3 appreciated the central location of Abberley Park highlighting their involvement in the delivery of weekly martial arts classes. Previously these classes operated at Abberley Park Hall but earlier this year, due to increasing hire charges, transferred outdoors to the North Lawn. Participant 3 highlighted people travel from across Ōtautahi Christchurch to attend these classes.

Participant 5 lives in Auckland and travels to Ōtautahi Christchurch monthly to visit participant 4 and their wider family. A visit to this park is part of most trips identifying the playground, quiet location and the trees as what they most value. Participants 4 and 5 responded positively to the maintenance of the park but were unable to comment or rate the maintenance of the creek or the perceived water quality.

Only participant 3 was not aware of the creek despite visiting multiple times a week over the last ten years. Participants 1 and 2 were able to identify the creek's name but participants 4 and 5 were not.

From participant 3's perspective the St Albans community treat the park as part of their own, many people sacrificing their own time to the upkeep of the grounds.

In discussing the creek's connection/contribution to Ōtautahi Christchurch waterways, 4 of the 5 participants recognised its significance but were unsure about where the creek flowed outside of the park, particularly from the south/west of the city into the St Albans area.

6. Recommendations

1. St Albans Residents Association and the Friends of Abberley are encouraged to share this research with the St Albans community and key stakeholders including Christchurch City Council, as park owner, and Environment Canterbury, to raise awareness and advocate for changes that improve the health of the creek. Early indications are that this research will be shared at the Edgeware Village Mid-Winter Christmas Market on 18 June 2022.

2. Future research and projects are recommended to understand and promote the creek's position and role within the Ōtautahi Christchurch waterways network with a focus on promoting youth stewardship and community participation. Christchurch City Council's Parks Unit has strong connections with community participation, ecology education and planting events which may be useful. Over 41,475 of volunteering hours were recognised as contributing to the care of the city's parks in the last year (Christchurch City Council, 2022). Kate Russell, Parks Programmes and Partnerships Manager would be an initial point of contact.

3. A natural approach to improving the blue infrastructure is recommended, specifically riparian planting on the banks of St Albans Creek in the section located within Abberley Park. This is a well-known and common strategy used to not only keep pollutants and foreign material out of waterways, but also to provide shade and habitat for invertebrates and fish species. Additional research would be required to identify the area(s) of the creek where planting is most needed. Since the cover of the creek varies from being beneath tree cover into a more exposed and open area at the culvert end, the suggestion would likely be to improve planting on the downstream reaches.

4. Further research is recommended to identify which species would be the best fit for planting at the creek. It is recommended that a native species is chosen to ensure an optimal outcome. Though within the catalogue of native species to choose from there is a variety of options. Therefore, an awareness of the existing plants, trees, and surrounding ecology would need to be taken into consideration when choosing the species used for the planting to ensure there is a harmonious relationship between the creek and the already existing plants and trees. This could be done as a community effort to both increase awareness of the park and its ecology and to promote more native planting in the communities' own private properties, as a raised awareness of the benefits of native species might encourage plantings within people's own properties.

5. Community engagement using place-based education approaches could provide opportunities to foster stewardship for Abberley Park and the St Albans Creek, with potential involvement of the St Albans School and other local schools. Doing this in partnership with the Rehua Marae could provide an avenue for the mātauranga Māori perspectives of stewardship to be passed on to the youth, but mostly to enhance wider benefits in the community.

6. To support increased identity and significance of the St Albans Creek, we recommend signage is introduced to the park that highlights the creek's name, its connection to Ōtautahi Christchurch waterways and ecological importance for the St Albans community. The design of the poster provides an opportunity to involve local design students at ARA or the University of Canterbury to solve the communication problem

and achieve a professional sign installed in the park for many years. The location of the sign should also be given some consideration.

7. Conclusion

Abberley Park is clearly valued by residents of St Albans and visitors to the park with many social, recreational and wellbeing benefits. Through our visits to the park, it was clear that this is a valued community space for residents and visitors with common interests, activities and passion. This public space supports community networking by creating a sense of place and a feeling of connection to the St Albans community that helps foster a sense of local identity, shared experience and stewardship.

Green infrastructure is perceived as strong and well represented in the park. As a heritage park established in the colonial era many of the trees and plants are exotic though through natural decline it is expected these will be replaced with native varieties over time. Blue infrastructure is not as well defined or supported in the park. This research provides recommendations that support a natural approach to mitigating the water quality issues with riparian planting that responds to existing plants and trees.

Physically the creek is well recognised however, work is required to help more residents and visitors to identify St Albans Creek. Recommendations include research to identify the source of the creek and impact within the Ōtautahi Christchurch waterways, which can be incorporated into new signage in the park.

SARA's concerns regarding engagement with the youth sector was reflected in our findings with only five percent of the participants in the online survey and one interviewee identifying in the age group '18 to 24'. The literature supports the idea that youth have a role in the ongoing stewardship of the environment but whether they actively want to play this role remains relatively unknown.

As a research experience, the diversity of our disciplines across the university provided different perspectives and approaches to this work. We have worked well collaboratively, running both field activities concurrently so everyone in the team could be in the park together as well as having a full day of research analysis/write up to identify conclusions and recommendations.

Working with our community partners throughout this research has been hugely beneficial from the initial meeting in the park to regular online meetings for discussion and feedback through to being able to present the research to them at the mini conference at the end of the semester, they have been with us throughout the journey. An example of the level of partnership would be the development of the community survey. Feedback received from the community partners, and members of the Friends of Abberley Park, and our supervisor was discussed at weekly meetings, which resulted in a community survey that maintained a focus on the park and creek but allowed opportunities to understand types of activities and what people valued about the park as well as some key demographics.

8. Acknowledgements

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9. Appendices

9.1 Appendix A: Community survey questions

Question 1:
This survey aims to understand people's perceptions about the park, there are no right or wrong answers.

Are you a local from the St Albans area?

- Yes
- No

Question 2:
How often do you visit the park?

- Regularly
- Casually
- Never

Question 3:
What are your purposes for visiting the park? (Select all that apply)

- Walking
- Use of playground
- Attend events/classes at Abberley Hall
- Use of paddling pool
- Dog walking
- Visit the rose/scented garden
- Jogging/ physical exercise/other sports
- Space for ball games
- Picnics
- Other (please Specify)

Question 4:
What do you value about the park? (Select all that apply)

- Location
- Accessibility
- Safety
- Seating/picnic areas
- Amenities (Playground/paddling pool/public toilets/hall)
- Heritage of the park
- Quiet space
- Gardens
- Trees
- Creek
- Wildlife
- Other (please specify)

Question 5:
How do you perceive the maintenance of the park?

- Very high
- High
- Satisfactory
- Poor
- Very poor
- Don’t know

Question 6:
Are you aware of the creek that runs through the park?

- Yes
- No

Question logic: display question 7 if the answer to question 6 is yes.

Question 7:
Do you know the name of the creek?

- Dudley Creek
- St Albans Creek
- Don’t know
- Other (please tell us)

Question 8:
How do you rate the maintenance of the creek?

- Very high
- High
- Satisfactory
- Poor
- Very poor
- Don’t know

Question 9:
How do you rate the quality of the creek?

- Very high
- High
- Satisfactory
- Poor
- Very poor
- Don’t know

Question 10:
Do you know about, or have you seen any critters in the creek in the last 6 months?

- Yes (please tell us)
- No

Question 11:
To what extent do you recognise the creek connects/contributes to the wider waterways across Christchurch?

- High

- Medium
- Low
- Don’t know

Question 12:
Any other comments about Abberley Park or the creek?

Thank you for participating in our research, we would now like to ask a small number of questions about you.

Question 13:
Age

- 18 to 24
- 25 to 44
- 45 to 64
- 65+

Question 14:
Gender

- Male
- Female
- Non-binary / third gender
- Prefer not to say

Question 15:
Which suburb/neighbourhood do you love in?

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