



Research

Community actions to revitalize urban blue and green capitals: learnings from Abberley Park, Ōtautahi Christchurch, Aotearoa, New Zealand

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ABSTRACT. This study aims to investigate the revitalization of blue-green capital in urban communities, to enhance local well-being and social-ecological resilience at the neighborhood scale. Fostering more-than-human well-being can play a central role in maintaining overall health in cities. The study first investigates what are the key priorities recognized to enhance blue-green capital. Second, what are key challenges and opportunities for community-led revitalization of blue-green capital? And how can local communities act to bridge identified gaps in revitalization processes centered on blue-green capital? We partnered with the St. Albans Resident Association (SARA), to orient a place-based, context-sensitive approach to the methodology to address the research questions in the Abberley Park, in Ōtautahi Christchurch, New Zealand case study. This is one of eight city heritage parks in Christchurch and an example of a lush mix of native and introduced, exotic trees and vegetation. However, the health of the St. Albans Stream, as seen in the park, is a concern for the local community. Nature-based solutions to control pests and invasive species, and riparian planting can encourage local actors to align short-term goals and active efforts toward revitalizing the St. Albans Stream, starting with the identified areas at the park. The results highlight the perspectives of long-term residents, volunteers, and community leaders, which can inform local policies and actions focused on enhancing the health of the St. Albans Stream and its sensitive habitats starting at Abberley Park. Enabling the identification of key local actors in the St. Albans community, the research demonstrates the importance of context-sensitive approaches to identify potential organizational and social contributions when considering blue-green capital and urban well-being at neighborhood scales.

Key Words: *collaboration; community; more-than-human; neighborhood; park; resilience; revitalization; social-ecological; well-being*

INTRODUCTION

This study aims to investigate how blue-green capital can be revitalized by urban communities to enhance local well-being and resilience at the neighborhood scale. Urban blue-green capital is a key component of social-ecological well-being and resilience, interconnecting human and more-than-human well-being. For example, clean freshwater and thriving vegetation depend both on human agency as well as on capabilities that exceed the human will to shape overall health in cities (Holling 2001, Allen et al. 2019, IUCN 2019, Brears 2023, Yates et al. 2023). Blue-green capital extends beyond elements, infrastructure, and spaces; capital encompasses flows and networks of knowledge, services, and resources (Aronson et al. 2007). This relies on nature's will, as outlined in literature on more-than-human and nature-based solutions. To effectively manage urban environments, it is essential to consider natural, open green, and rewilding elements and spaces in cities in a holistic manner, along with their interactions, cycles, and service capabilities, considering flows and synergies (Brand 2016, Ruckelshaus et al. 2016, Bateman and Mace 2020, Kurniawan et al. 2021). Blue-green capital has connections to social capital as well as organizational capabilities, networks, and know-how, which often are unaccounted for in governance (Parsons 2023, Prana et al. 2024). Studying such interconnections is particularly relevant in cities, where in recent years, there has been a global decrease in well-being (Okulicz-Kozaryn and Valente 2024).

Blue-green capital embodies place-based knowledge that supports urban well-being and contributes to the complex social-ecological fabric of neighborhoods and cities (Andersson et al. 2021, 2022). It underpins indispensable benefits, sustaining

human and more-than-human health interconnectedly across scales (Meney and Pantelic 2021, Russo and Cirella 2021, Siimes et al. 2023, McNabb et al. 2024a). More-than-human refers to beings who possess their own identities and agencies. Their capabilities go well beyond the human (Haraway 2013, Puig de la Bellacasa 2017, Yates 2021, McSherry and McLean 2023). This research takes a more-than-human lens and argues that blue-green capital can be central to strategizing scalable community-led actions focused on the revitalization of bodies of water in public open spaces. For urban communities, like the St. Albans Residents Association (SARA) in Ōtautahi Christchurch, Aotearoa New Zealand (where the case study is situated), fostering more-than-human well-being can play a central role in enhancing blue-green capital at the neighborhood scale. Indigenous and local knowledge play important roles in holistic well-being because they are context-sensitive and place-based, interconnected to native species and their habitats, as well as the resources and practices to maintain overall health. In Aotearoa, Indigenous knowledge plays a key role in activating the local revitalization of blue-green capital among rapidly diversifying urban communities. Public engagement for the revitalization of blue-green capital should extend beyond the capacity of urban actors, like councils and institutions, to underscore the role played by communities (Ugolini et al. 2018, Diver et al. 2024). We adopted a community-partnership approach to investigate the key priorities recognized by the local community as needing revitalization to enhance blue-green capital?

As urban areas expand and intensify, the vitality of blue-green capital can be jeopardized. Internationally, as in Aotearoa, mounting urbanization continues to impact the quality and

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accessibility of open, natural spaces, undermining their capacity to provide benefits to communities (Howden-Chapman et al. 2015, Kiddle et al. 2021). The last decades indicate a loss of private open spaces and public spaces cannot compensate for such losses in major cities (Shade et al. 2020, Parliamentary Commissioner for the Environment 2023). Despite opportunities to enhance livability, urban intensification jeopardizes well-being where natural capitals are limited (Dobson 2021, Kronenberg et al. 2021, Wang and Foley 2023). This is particularly relevant in rapidly changing cities, with human and more-than-human relationships systematically disrupted. Societal awareness of the interdependencies between human and more-than-human well-being (Yates 2021, Steele 2023), and their relevance in urban governance frameworks (Parsons 2023), is needed to rewire blue-green capital toward healing, sustaining, and upscaling healthy and thriving practices in urban environments (Doughty 2019, Foley et al. 2019, Hearn et al. 2023). With a context-sensitive, case-study approach, this research considers a second question: what are key challenges and opportunities for community-led revitalization of blue-green capital?

Literature on social-ecological perspectives, ecosystem services, nature-based solutions, biophilic urbanism, and urban resilience maintains that nature-societal relationships are often underscored in environmental change processes (Vallance et al. 2019, Kiddle et al. 2021, Mukherjee and Shaw 2021, McNabb et al. 2024b). Biophilic urbanism literature examines cities as part of social-ecosystems, exploring how urban design enhances blue-green capital (Beatley 2016). It recognizes social dimensions to support human contact with nature, ecological diversity, and vitality, while addressing challenges posed to public health and urban resilience (De Luca et al. 2021, McDonald and Beatley 2021). As such, neighborhood social networks can enhance opportunities for communities and local institutions to collaborate to identify priorities and enhance knowledge to sustain and develop social-ecological capitals (Barthel and Isendahl 2013). However, gaps remain in understanding how collaborative networks and community efforts can be mobilized to enhance blue-green capital at local scales. Addressing these gaps, we investigated a third research question: how can local communities act to bridge identified gaps in revitalization processes centered on blue-green capital?

The significant loss of urban ecosystems, in quantity and quality, is behind a growing focus on revitalization in cities (Foley et al. 2019, UNDESA 2019, Manley et al. 2024). Revitalization refers to strategic and intentional processes to enhance the living conditions and identity of urban environments (Matos 2012, Pichler-Milanovič and Foški 2015, Steele 2022). More specifically, the International Union for the Conservation of Nature (IUCN) states that revitalization includes:

Actions taken to protect, manage and restore natural or modified ecosystems that can effectively and adaptively address societal challenges while benefiting human well-being and biodiversity (IUCN 2019).

This highlights that the dynamics between environmental, economic, cultural, and social capital must be considered in urban revitalization (Pawson and Christensen 2014, Couper 2018). The interconnection between social and natural capital is recognized by intergovernmental bodies and planning agencies (UNDESA 2019, UN-SDG Summit), advocating for scalable climate-

adaptive strategies. Our study adopts a social-ecological lens of resilience as argued by Allen et al. 2019, Jozaei et. 2022, and Clement et al. 2024, which outlines resilience as an occurring feature of social-ecological systems, recognizing interactions across spatial and temporal scales. We delve into the qualitative aspects of blue-green capital, emphasizing interconnections between human and more-than-human well-being (see Yates 2021, Cloke et al. 2023a, and Parsons 2023). By focusing on the neighborhood scale, our research aims to guide urban governance in the “more-than-human city,” public and community engagement, and management processes centered on blue-green capital (Steele 2023, Tozer et al. 2023, Yates et al. 2023).

METHODOLOGY

Our research adopts a context-sensitive approach, combining qualitative methods in a case study, defined in partnership with a local organization. As outlined by Flyvbjerg (2006), case study research designs are a type of qualitative inquiry that can serve to situate research questions in specific contexts. This research was partnered with the St. Albans Resident Association (hereafter SARA), orienting a place-based, geographically situated approach to the study, with relevance for the local community. The data collection methods were developed in cooperation with SARA. The methods are qualitative and include visual and spatial elicitations, with a thematic analysis.

Case study

Planned as a garden city during colonialism, Ōtautahi Christchurch in Aotearoa, New Zealand, is a water city that offers a network of public, open, green spaces, and nature-based amenities across the urban fabric (Hobbs et al. 2022). In the northern inner suburbs and amid a wider regional context of slower socioeconomic diversification, St. Albans has stood out in the city region for several generations, due to the socioeconomic and demographic diversity of the resident communities. The St. Albans Stream is a tributary of the Avon-Ōtākaro River, traversing Abberley Park in St. Albans (Fig. 1). Abberley Park was founded on 17 February 1940 to celebrate the centennial of the 1840 Treaty of Waitangi (CCLA 1940). Because of its historical relevance, it is one of eight city heritage parks in Christchurch and an exemplar of a lush mix of native and introduced exotic trees and vegetation. The mix of vegetation along the stream allows for a shaded walk, unique in the context of Christchurch (Mitchell 2024). The ecological and social diversity, history, and spatial configuration of Abberley Park provide the basis for its conviviality, rich in multicultural, intergenerational, and multi-species interactions. Various areas in the park have their own social, historical, and ecological relevance in the urban fabric (CCLA 1942, CCC 2015), connecting St. Albans with the wider city. However, the health of the St. Albans Stream is a concern for the local community.

Like many urban waterways in Christchurch, the St. Albans Stream was channelized and partially piped in the 19th century (Watts 2011). Although connected to the Ōtākaro-Avon River, much of the stream flows underground, remaining unknown even to residents (Darling and Kozanic 1986). The neighborhood holds historical and cultural importance for diverse Indigenous perspectives due to the significance of the local ecologies and Rehua Marae, particularly for Ngāi Tūāhuririv (sub-tribe of Ngāi Tahu who hold customary rights over the territory of the city) but also for the urban Māori diaspora living in the region.

Fig. 1. Ōtautahi Christchurch, situating St. Albans and Abberley Park in the city (left), and satellite imagery of Abberley Park (right; Open Street Maps, and Land Information New Zealand).



In the Canterbury earthquake sequence (CES), the eastern suburbs of Christchurch were heavily impacted by liquefaction (Uekusa and Cretney 2022, Cloke et al. 2023b), however, St. Albans is situated in a geomorphological area where the impacts were considerable but less severe. In the years following, there has been increased local awareness of riverbanks subsiding and processes of erosion along the St. Albans Stream. The geological conditions of the city have shifted significantly since then, and this has exacerbated flood risks (Nguyen et al. 2021). There are various social and physical vulnerabilities and opportunities at play when considering local revitalization and urban resilience in such circumstances. In some areas of the city, community resilience is a contested issue with flooding occurring frequently (Uekusa and Cretney 2022). The responses to the CES highlight a shift in assumptions underpinning urban water management (Challies and Tadaki 2022), with an increasing focus on fostering urban nature.

The rationale for adopting this case study assumes that open public spaces and their natural elements are relevant for assessments of blue-green capital in cities, providing indicators for the livability of neighborhoods (Rosso et al. 2022, Schindler 2023). Moreover, the St. Albans Stream and Abberley Park are relevant in the context of the city, and wider urban Aotearoa with similar contexts, in which communities face significant urbanization pressures and could benefit from context sensitivity (Andersson et al. 2021) and social-ecologically driven revitalization practices. This case study thus adopts a context-sensitive approach to qualitative inquiry (Flyvbjerg 2006, Hay 2016). This was suitable for understanding community perspectives on the revitalization of blue-green capital at neighborhood scales.

Place-based community partnership

The community partnership was place-based, centered on the St. Albans Stream in Abberley Park. Connected with the research team through past collaborations, SARA, as a community partner, contributed to steering key research questions and methods. The St. Albans community and SARA are invested in identifying best practices to enhance the vitality of the St. Albans

Stream in the neighborhood and in facilitating social activities in Abberley Park and other local public spaces to strengthen a local sense of place and well-being. Previous community-based student research, partnered with SARA (see Blundell-Dorey et al. 2022, Edmonds et al. 2022), highlighted that the health of the St. Albans Stream was a concern.

Data collection

The data were collected through qualitative methods including two focus groups with community members and one interview with a local community leader. Qualitative data and analytics were the most suitable, allowing for subjective understandings and interpretations of the health status of the park and stream, from the perspective of the participants (Patton 2015, Hay 2016). Our study considers participants as subjects, with capabilities to understand and shape relationships with the park and stream, contextualized within lived experiences and place-based knowledge. The qualitative methods included map elicitations, to contextualize the qualitative data.

Participant selection and recruitment followed a standard process, including informing prospective participants and discussing the terms of the research before acquiring consent to participate. Initially, recruitment focused on residents, community leaders, and volunteers, as well as local council staff. However, only one council employee responded, and this participation was later withdrawn due to professional concerns. Consequently, our pool of participants includes residents, volunteers, and community leaders.

The St. Albans Resident Association and the Friends of Abberley (a community-led, organized group connecting various board members and leaders from the northern inner suburbs of Christchurch, including St. Albans, Edgware, and Papanui) helped recruit participants through their networks and Facebook pages. The study included participants over 18 years old, whereas the focus groups were also open to young people if accompanied by their parents or legal guardians. The semi-structured interview captured the perspective of a long-term community leader. Coincidentally, the first focus group comprised females aged 60

years plus, including long-term residents, local volunteers, and community leaders. The second focus group comprised males aged 50 years plus, also long-term residents and volunteers. The participants were highly educated and strongly involved in the community and with Abberley Park. We adopted a place-based approach to the methods, with spatial elicitation, inviting the participants to map their perspectives and help highlight the geographical context of the case study. This facilitated place-based discussions along with various photo elicitations initiated by participants.

Data analysis

The data collection, treatment, and analyses follow the principles of qualitative inquiry in human and social research. As outlined by Denzin et al. (2024), this involved attention to participants' accounts and their contextualization, along with themed codes to classify the qualitative data, and collaboration with participants to verify the accuracy of transcriptions. The focus group discussions were audio-recorded, with the consent of all participants. Photos, local reports, and maps were discussed during the data collection, with a few visual elicitations initiated by participants. The audio recordings from the focus groups and interview were transcribed using the assistance of an online, open-source automatic transcribing service. After manually editing the transcripts, these were shared via email with participants who wished to verify the collected data. The finalized data include maps with data collated from the qualitative methods and photos illustrating the flavor of visual elicitations that emerged in the focus groups.

When applying qualitative methods, semi-structured approaches with themes linked to research aims can help contextualize and orient participants while allowing for the discussion of lived experiences, both sensorial and perceptions (DeLyser et al. 2010, Dowling et al. 2018). Our methods were semi-structured around three key topics, in which we sought to gather the perspectives of the participants and other sources of local information. First, the current condition of Abberley Park with attention to the St. Albans Stream and the possibilities for the park to support wider blue-green capital. This was relevant to the overarching research question, which focused on how urban blue-green capital can help orient community-led revitalization at the neighborhood scale.

With a community-partnership approach, our study investigated community perspectives on the future of Abberley Park and St. Albans Stream. This aimed to expand the understanding of key priorities for the revitalization of blue-green capital at the neighborhood scale, as recognized by the community in the case study. Third, we inquired about key challenges and opportunities for revitalization actions at the neighborhood scale.

RESULTS

Although gendered perspectives are outside the scope of this study, the first focus group was exclusively composed of female participants and the second of male participants. While the socio-demographics of the participants are not representative of the diversifying neighborhood, there were strong links between the participants and local voluntary networks in connection with SARA. The participants were actively engaged in the community, some with collaborative experiences with the local council and key actors in local projects.

With regard to the research question (How can local communities act to bridge identified gaps in revitalization processes centered on blue-green capital?), there was consensus among participants that the revitalization of the St. Albans Stream needed prioritization while focusing on the protection of sensitive habitats, namely through riparian planting. Another point of consensus was that the collaboration networks between key local actors were vital for sustaining blue-green capital and that cooperation and communication between residents, Indigenous representatives, local volunteers, and council could be improved with a focus on the St. Albans Stream and its wider connections in the city.

In both groups, the participants recognized the relevance of Abberley Park in the neighborhood and highlighted historical and social linkages to local amenities (Fig. 2). For instance, the Blind and Low Vision NZ Scented Garden, on the western side of the park, has relevant social and historical linkages. Overall, the results highlighted perspectives and lived experiences in the neighborhood throughout the years, in and around the park, and often with a caring lens for the more-than-human and the local community in St. Albans and the wider city.

It's not just what happens in the park. It (referring to revitalization led by the community) should consider the areas around it. It could be introduced through the park, then (...) around the park (...). St. Albans community leader, interview.

Such linkages signify the relevance of the park in the urban fabric while contextualizing it within the city's social-ecological networks, with some participants noting that scalable actions could start at Abberley Park to revitalize the stream, which could then extend through the neighborhood and wider urban fabric.

Identifying key priorities for urban revitalization to enhance blue-green capital

The participants named native and assisted plants, butterflies, moths, rats, ducks, eels, and birds and their habitats in the park, emphasizing their interdependence with the health of the St. Albans Stream. "Assisted" makes up a group of species or more-than-humans who move to an environment on their agency. Although the Monarch butterflies are not native to Aotearoa, the participants explained:

The Monarchs are now considered native because they made it to Aotearoa New Zealand.

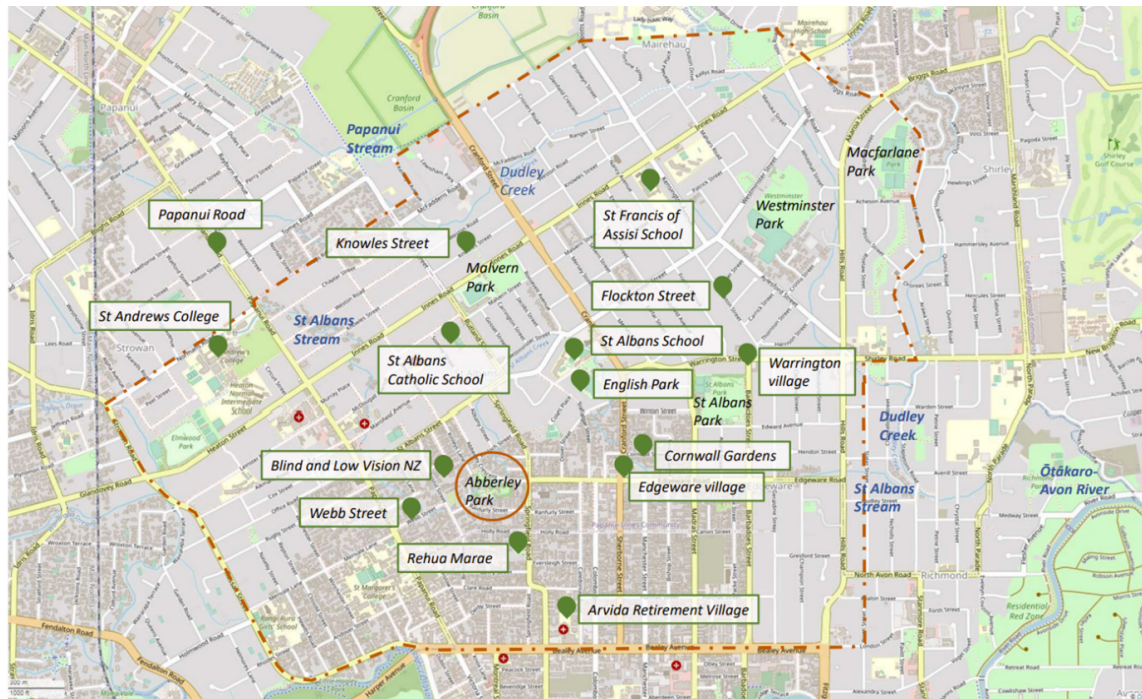
Another participant added:

We call them assisted natives, (...) we must assist them to...keep growing.

Pests and invasive species are a key concern for the local community. One of the participants, a long-term resident and everyday visitor to the park emphasized:

The poor health of the stream in the park is something that everybody is aware of (referring to the local community). (...) The width of the stream is widening; the sides are disintegrating. It can be disgusting if you have got a (...) dog and he comes out of the stream with black legs, (...) literally black.

Fig. 2. St. Albans administrative boundaries (in dashed red line), Abberley Park (circled in red) with highlighted places of connection (in green). Base map from Open Street Maps with summarized data from focus groups and interviews.



From the perspective of the participants, revitalizing the St. Albans Stream encompasses prioritizing activities to mitigate flooding and erosion, and control pests and invasive plants that jeopardize sensitive habitats in the park. Various locations adjacent to the stream were highlighted by the participants as requiring prioritization for regular maintenance (Fig.3).

Another participant said that the last time they were informed of cleaning activities at the St. Albans Stream in Abberley Park was years ago. This prompted the discussion of photos of cleaning activities at the park in 2017, near where the Monarch butterflies shelter. There were recommendations for cleaning actions led by the council to be communicated more clearly to residents and that such actions should happen more regularly. The participants agreed one of the key priorities for the management of the park and revitalization of the stream is to improve the communication between various council departments and key community actors.

Reflecting on the current management situation of the park, one of the participants added that:

(...) as management is concerned (...); it's a mess around the periphery of the park with ivy and a lot of weeds growing wild. (...) With a little bit of either effort from the council or the community, it could be taken care of (...).

This led the participants to discuss more-than-human health and the sustainable equilibrium between native, introduced, and assisted species in the park, with nature-based solutions emerging when one of the participants pointed out:

(...) Have you heard of the weed Tradescantia? (...) It was brought into the country as pot plants. (...) Currently, it's the number one invasive weed in New Zealand. (...) In Abberley Park, it's very close to the tree where the Monarch butterflies nest, along the riparian part of the stream. (...) The council is trying biocontrol in Christchurch with beetles. Three types of beetles can eat Tradescantia.

A tree succession plan to replace dead and maturing trees and vegetation in the park and ensure the protection of sensitive habitats along the stream was discussed by the participants. Some stressed the need for planning the succession of trees, suitable for native species, including birds but also insects:

(...) Suitable habitat for native moths and butterflies is quite important because we forget about the moths. You need the native plants for native moths. They've got to have that food... (...). In New Zealand, I think we've got about 2,000 species of native moths, and they all like their own little plant to live on. Cabbage trees are a beautiful example, and their cabbage tree moths.

The suggestions for riparian planting and pest control along the stream centered on supporting diverse vulnerable habitats in the park, including native and assisted species, particularly freshwater eels and Monarch butterflies. As seen in the park (Fig. 4), they are susceptible to rodent pests, erosion, and flooding, which affects the health of the stream. Some suggestions were evoked by photos and emphasized that sensitive habitats can help orient pest control and riparian planting led by the community. One of the participants articulated:

Fig. 3. Areas of Abberley Park requiring regular maintenance from the perspective of the participants (in orange). Location of park and stream photos marked in the map [authors' photos]. Base map from Open Street Maps.



(...) *We need to engage the community to start growing more Swan plants in the area (...).*

Concerned about the eel habitat, a participant shared accounts and photos of dead eels, reflecting on how this happened at the park, by the stream near the inaugural stone. This participant also showed a photo of a rat's nest in a tree near the paddling pool.

Another participant offered:

We can create an area of easy access to feed the eels, like somewhere we can safely get down to a step and then a platform.

Educational information targeting pet owners was touched upon, suggesting that the need for more awareness about the impacts dogs and cats have on the park, considering their interactions with sensitive habitats and species such as eels and butterflies.

In 2040, Abberley Park celebrates the 100th anniversary of its inauguration. This was mentioned as a date to aspire to for setting incremental steps for community actions centered on the health of the stream and the general state of the park. Suggestions for revitalization focused on scalable actions for riparian planting and the control of pests and invasive species along the stream. Clear signage, tree succession planning, and community-led actions to support revitalization initiatives were also suggested. Reflecting on previous community work with the council, one participant observed:

I think of good collaboration as community involvement on a structured basis. There's a plan for the park and together we can work on it. (referring to the long-term activity plan for heritage parks; see CCC 2021).

Fig. 4. The life cycle of Monarch butterflies (*Danaus plexippus*) can be a potential visual prompt to inform and engage local urban communities. A Monarch butterfly seen in Abberley Park (left), a Monarch chrysalis (center, in three stages), and a Monarch caterpillar feeding on a Swan plant (*Gomphocarpus physocarpus*) (left) [Source: authors' photos].



Tackling challenges and opportunities for urban revitalization centered on blue-green capital

From a community leadership perspective, there has been research on the health of the stream to justify mitigation plans through riparian plantings. However, the participants outlined that despite the local volunteer capabilities in the area, the planting plans led by the council offered limited opportunities for community input or participation.

It's a pity that we aren't able to implement our own community plan, stated one of the participants.

Tapping into collaborative and relational approaches is vital to implementing the community's vision for the park. The participants recognized that communication between the local council, local Indigenous representatives, and the residents could be improved, strengthening collaborative networks and

participation processes affecting blue-green capital. Reflecting on changes to Abberley Park playground led by the council, some participants felt these should have encompassed deeper forms of public participation to recognize Indigenous knowledge and community expertise and to address local concerns more explicitly.

The participants reflected on resources and local knowledge networks for the revitalization of the stream and associated habitats. Rehua Marae, an urban complex of multi-tribal spaces and blue-green spaces located nearby, was recognized by community leaders as a link for considering local strategies focused on re-indigenizing the stream and its surroundings (Fig.3). This area is ancestral land to Ngāi Tūāhuriri, a subtribe of Ngāi Tahu, where a vibrant urban native reserve links to St. Albans. This place is recognized in the local community as an exemplar of native-led revitalization along the stream that traverses this Māori complex of traditional buildings and spaces.

The third research question focused on how local communities can act to bridge identified gaps in revitalization processes centered on blue-green capital, and participants noted that cooperation between the council and the local community is a vital link for social-ecological revitalization strategies and planning. Referring to previous actions led by the community, some participants emphasized that there are various channels for the residents to act locally while building on existing relationships.

One of the participants added that:

It's a matter of getting people who've got the knowledge to be able to do it (...).

The Predator-Free St. Albans group was mentioned as a resourceful, well-connected group that can contribute to revitalization initiatives by helping to set and check traps and by sharing knowledge with the community on how to do this effectively in and around the park. The St. Albans History group and the Friends of Abberley were mentioned as potential contributors to organizing and supporting educational and social activities in the park to promote social engagement in the history of the park and local waterways. Local schools were referred to as potential contributors to educational events focused on riparian planting and community activations alike. Social engagement activities, like picnics and community gatherings aimed at families and pet owners, were suggested as opportunities to bring more life to the park and help enhance local awareness and interest in the health of the stream.

Overall, the participants recognized the role of the wider community in the revitalization of the park, with various people expressing enthusiasm about opportunities for community-led actions. Reflecting on the "Abberday" organized by the Friends of Abberley, one focus group participant emphasized:

I am keen to have community planting because people might take care of things that they planted.

Another added:

perhaps an organized planting day could help stimulate support from the local community.

The diversity of activities was mentioned as important, with one participant stating:

(...) different types of things (e.g., amenities and activities in the park) could get more people involved.

Overall, social engagement at the park was recognized as important among participants because it can help promote revitalization actions led by the community across the neighborhood.

DISCUSSION

Our study offers insights into ways to strengthen blue-green capital at the neighborhood scale and contributes to a long-term collaboration between the university and SARA in St. Albans in Christchurch. It resulted in the identification of key priorities and suggestions on how local actors can actively overcome existing limitations in the case study to consider the revitalization of the St. Albans Stream in Abberley Park.

The findings outline community concerns over the health of the St. Albans Stream, and how this impacts native insects, birds, freshwater eels, and plants. These findings align with more-than-human and human research that outlines the interconnections for holistic health and well-being (Haraway 2013, Puig de la Bellacasa 2017, Yates 2021, Russo and Cirella 2021, and Cloke et al. 2023a) and social-ecological resilience (Adger 2000, Adger and Brown 2009, Allen et al. 2019, Clement et al. 2024). A key step to engaging urban communities is to raise public awareness of more-than-human health as part of enhancing local urban blue-green capital. This is relevant for urban and environmental planning and research to contribute to enhancing blue-green capital by supporting communities in identifying key priorities for urban revitalization to focus on more-than-human well-being as a key aspect of local social-ecological resilience.

The centennial anniversary of the park in 2040 was suggested as an important driver for community engagement, illustrating the potential of heritage and urban parks (Rastandeh and Jarchow 2022, Rosso et al. 2022) to support community-led revitalization practices centered on blue-green capital. Mobilizing efforts to enhance the visibility and vitality of waterways and sensitive wildlife through the urban fabric with that timeline can help the cooperation between councils, Indigenous representatives, schools, residents, volunteers, and local actors to advance the revitalization of blue-green capital. This research examined the potential roles of groups like SARA, Predator-Free St. Albans, Rehua Marae, the Friends of Abberley, local schools, and the St. Albans History group. Educational approaches to enhance social engagement and community mobilization were also suggested by the participants. Rethinking human scale and recentring neighborhood scales in urban revitalization (Poli and Imbesi 2022) are relevant to achieve actions capable of igniting multi-scalar changes across wider urban systems.

Centring waterways and their sensitive habitats in open public spaces, this work highlights community perspectives on caring for the more-than-human in urban environments to revitalize blue-green capital and enhance overall well-being. Given accelerated urban pressures that threaten local ecologies, urban identity, and social-ecological resilience worldwide (Allen et al. 2019, De Luca et al. 2021, McDonald and Beatley 2021), research on the interconnections between human and more-than-human health is particularly relevant in cities. Although there has been ample evidence in research about the advantages of blue-green capital for cities (UNDESA 2019, Manley et al. 2024), for instance, the

health benefits resulting from access to clean freshwater and thriving vegetation (Beatley 2016, Doughty 2019, Hearn et al. 2023, McNabb et al. 2024b), there are various conceptual and practical gaps in conceptualizing blue-green capital within social-ecological resilience (Allen et al. 2019, Foley et al. 2019, Clement et al. 2024, McNabb et al. 2024), urban governance, and management (Mukherjee and Shaw 2021). This study contributes to international debates on urban well-being and social-ecological resilience at a neighborhood scale while demonstrating the importance of open public spaces, identifying priorities, and relational approaches to tackle challenges and opportunities to enhance blue-green capital.

Our findings resonate with what has previously been written on collaborative urban environmental management (Gimenez et al. 2016, Diver et al. 2024). Processes to revitalize blue-green capital must consider local knowledge and networks while tapping into existing, trusted connections to align revitalization efforts and strategies. Our study outlines the potential role of diverse community groups in advancing actions focused on protecting the habitats of freshwater eels and Monarch butterflies. The participants recognized the potential of Abberley Park as a heritage neighborhood and open public space with strategic connectivity in the urban fabric, which can help the community to initiate scalable revitalization actions through the area, starting with riparian planting in specific areas of the St. Albans Stream. The role of open public spaces in cities for socio-ecological resilience stands out from a political-ecological perspective because of the possibilities that these spaces offer to urban communities for actions that can start at the neighborhood scale. For instance, events in public parks can promote step-by-step, practical changes and encourage co-designing solutions with communities.

Urban communities engaged with open public spaces, particularly near waterways, can play strategic roles in supporting scalable actions with local engagement and volunteers. Our study outlines various practical directions for SARA, the community partner, to organize scalable actions for blue-green well-being in St. Albans, like riparian planting at Abberley Park. Overall, our research findings support that Abberley Park has a strong potential for actions at the neighborhood scale, which can then expand into the wider urban fabric. This type of research is relevant for urban community groups in rapidly changing neighborhoods that are intensifying in-built mass and diversifying in socioeconomics (McNabb et al. 2024a). This study contributes to research on holistic well-being and urban nature (Yates 2021, Gandy 2022, Steele 2023, Yates et al. 2023) by illustrating how parks and blue-green spaces can support various ways for communities to meet, co-create, visualize, and communicate collective visions for social-ecological revitalization actions.

In Aotearoa, *tuna* (freshwater eels) are considered *taonga* (treasure) species (Te Wānanga o Raukawa and Department of Conservation <https://www.doc.govt.nz/nature/native-animals/freshwater-fish/eels/tuna-a-tatou-taonga/>), and Monarch butterflies are assisted species with their well-being depending on the health of urban waterways. The need to enhance opportunities for community-led action is relevant for local ecological politics at the scale of urban communities (Rangan and Kull 2009) in revitalization processes of urban blue-green capital in cities.

Identifying local priorities is vital for blue-green capital because it opens possibilities to strengthen social engagement and connectivity to Indigenous perspectives and place-based values. The participants referred to best practice examples in the city along rivers and streams of native habitats and clear signage that can help inspire the next steps to revitalize blue-green capital in St. Albans. The participants' awareness of the ecological, historical, and social backgrounds of the park in the city highlights its relevance in supporting scalable actions to revitalize urban waterways in Ōtautahi, Christchurch. The findings highlight that actions for the revitalization of blue-green capitals in St. Albans must include social engagement initiatives to enhance networking, as well as relational and educational practices aimed at riparian planting, tree succession planning, and co-production of signage.

The findings outline nature-based solutions, to be considered at the neighborhood scale, to control pests and invasive species like the beetles that eat *Tradescantia* plants. Riparian planting has been recommended in past research and reiterated in this study because it can encourage local actors to align short-term goals and active efforts toward revitalizing the St. Albans Stream, starting with the identified areas at Abberley Park (Fig. 3). This study has implications for planning the succession of trees at the park, a vital step for the preservation of tree canopy in the neighborhood (Morgenroth 2022, Mitchell 2024) and to protect sensitive habitats for species such as the Monarch butterflies and the freshwater eels. We show that in case studies like Abberley Park, context-sensitive methodological approaches can support practical applications with community partners and contribute to evidence-based international learning databases, focusing on possibilities for community-led revitalization of urban blue-green capital at city scales.

CONCLUSION

This research provides insights to strengthen blue-green capital at the neighborhood scale and can inform the next steps for the community-led revitalization of St. Albans Stream, with incremental and scalable actions starting at Abberley Park. It outlines perspectives that can help advance plans affecting blue-green capital in the neighborhood (see CCC 2015, 2023). The analysis allowed for the identification of priorities and ways to engage key local actors to strengthen collaborative networks with relevance for the revitalization of St. Albans Stream. The role of social networks for blue-green capital is highlighted with findings that can inform local policy to enhance urban well-being while implementing plans, for instance, to advance targets like the United Nations - Sustainable Development Goals (UN-SDGs), at neighborhood scales.

This study highlights parks, open public spaces, more-than-human, and waterways as part of blue-green capital, which can help direct social engagement focused on supporting native and assisted wildlife in cities. This has ramifications for urban and environmental planning and public health, particularly in policymaking but also for education and research practices. Revitalization can open polyvocal debates, and this research emphasizes the role of relational approaches among key actors. The research participants included local volunteers, long-term residents, and community leaders but lacked youth, Māori, and Pasifika perspectives. This limits the representativity of the study but highlights the need to further research such perspectives.

The identification of key collaborative networks in the St. Albans community, our research demonstrates the importance of context-sensitive approaches to identify potential organizational and social contributions when considering blue-green capital and urban well-being at neighborhood scales. This resonates internationally in contexts where communities strive for environmental justice in urban governance practices (Barthel and Isendahl 2013, Cloke et al. 2023a). Social networks connecting citizens and organizations to co-produce, use, and care for collective, natural, and built capitals are as vital as the physical infrastructures that support them (Vallance et al. 2019). Although this study outlines feasible steps for community-led revitalization actions, it is still necessary to research organizational capabilities among local networks to develop cooperation strategies in the area.

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Data Availability:

The qualitative data analyzed in this study had the names and information of participants anonymized. The ethics approval (Approval n. FS2023-19, 24 May 2023) was granted by the Research Ethics Committee of the Division of Arts, Law, Psychology and Social Sciences at the University of Waikato, New Zealand.

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