How cross-sector partnerships are scaled up for urban ecological impacts:

Strategising biodiversity and tackling grand challenges to create synergies for the planet, people and profit

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Abstract

This research aims to advance strategic management for the 21st century by investigating cross-sector partnerships to solve complex societal problems. As part of the People, Cities & Nature research program funded by the Ministry of Business, Innovation & Employment (MBIE UOWX1601), this study analyses how CSPs are impacting urban ecological outcomes. The overarching research question is: *How do CSPs achieve positive impacts for urban ecology?* The sub-questions are broken into two categories*:* strategy and urban ecology impacts.

To uncover the latest insights into CSP strategies and the impacts achieved by CSPs, the sub-questions are*: How can different sectors collaborate effectively?; What are the frequently identified barriers to effective collaboration?; How is success measured within CSPs?; What impacts are being achieved for urban ecology?; and What is different or unique to urban ecology partnerships?*

A qualitative cross-case analysis was used, based on six case studies in New Zealand across local, regional, and national scales. Several partners from each case study were interviewed across a range of sectors- public, private and community. Also interviewed were experts in CSPs not directly involved in the cases, but with experience across multiple partnerships. A total of 30 people were interviewed using a semi-structured approach, and each interview was transcribed and uploaded to NVivo. NVivo was used to disassemble the data for a thematic analysis on how to be effective, measure success, and what impacts were achieved. Then a four-stage thematic analysis was carried out to uncover insights.

Systems thinking was applied to bring together strategic management and urban ecology concepts as a framework for understanding CSPs for urban ecology. Systems thinking allows the researcher to model and compare CSPs of varying complexity, scale, and temporal elements as part of one system. Using a systems thinking approach, impacts related to all the pillars of sustainability- ecological, economic and social- are examined. By applying systems thinking, diverse people across a system can scale up impact by combining their resources and levers to harness public interest and tackle major societal issues. However, it takes a high degree of collaboration to maximize efficiency and impact.

This research explicates how managers can capitalize from collaboration and benefit the organization and wider society. The researcher initially aimed to identify successful CSP models that engaged in the private sector; however, the data showed that people and relationships play a much greater role in longevity, success and impact. When comparing the four skillsets for effective collaboration, the data showed interpersonal skills were the most valuable to build and maintain relationships. It is well known that trust is a critical factor in effective CSPs as it is the foundation for a strong relationship.

The data showed that relationships enable a network to form in pursuit of a common goal or shared values. Growing and strengthening the network is the key to creating system change that mutually benefits the planet, people and profit. The main barriers identified were time and monitoring and evaluation data. What this research uncovered is that personalities play a significant role in CSP success. Because CSPs scale up impact as they grow, the right personalities could attract large groups of people to the network, therefore amplifying positive impacts. This type of persona is called a “connector”, a new term for CSP theory.

Ultimately, this research aims to make CSPs more accessible to all sectors. Given the private sector’s impact on ecological and social issues, businesses have immense potential to contribute to the 2030 SDG targets. The CSP activity happening in 2020 to address the grand challenge of biodiversity loss will be captured by this study. Using the partnership monitoring and evaluation framework, this study classifies the CSP impact on urban ecological outcomes and benefits to wider society. By fusing strategic management and urban ecology theory, a new framework is proposed for people to conceptualise their own cross-sector collaboration and impact: Connect, Align, Grow and Evolve.

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Contents

List of figures

List of tables

Chapter 1. Introduction

The 21st century is distinctive as a time of globalisation, ever-increasing complexity, and an existential ecological crisis. Unsustainable human activities have pushed the planet to a great mass extinction (Wagler, 2011; Ceballos & Ehrlich, 2018). Biodiversity is vital to life on this planet; therefore, biodiversity considerations transcend all economic interests (Boiral & Heras-Saizarbitoria, 2017). As the European Commissioner for Environment said in a speech at the launch of the 2013 Air Quality Report, "if you think the economy is more important than the environment, try holding your breath while counting your money" (Potocnik, 2013).

Biodiversity includes all plants, animals, and microbes of the natural environment; the components of our ecosystem which maintain the systems and conditions necessary for life. Biodiversity is "the variety of life, including variation among genes, species and functional traits" (Cardinale et al., 2012, p. 60). As biodiversity decreases, the planet is more likely to experience "destabilised system processes and the erosion of resilience" (Cooke, West & Boonstra, 2016, p. 835). Ecological conservation is typically focused on unfragmented, rural areas. However, urbanisation is a major source of habitat destruction and fragmentation, which are significant factors in species endangerment and extinction (Magle, Reyes, Zhu & Crooks, 2010).

As urbanisation, pollution and other human activity continue to deteriorate the planet's biodiversity, scientists have predicted abrupt impacts. For example, if deforestation of the Amazon continues at the current rate, it will disappear entirely in 50 to 100 years (Shukla & Sellers, 1990). The Brazilian Amazon basin is home to approximately half of all the world's species, meaning removal of the rainforest would have dire effects on global species diversity and plant-animal interactions. A study showed that when the rainforest is replaced by pasture, there is a substantial increase in temperature and a decrease in rain which intensifies droughts and global warming (Shukla & Sellers, 1990). Furthermore, these hot, dry conditions will make it even more difficult for the forest to regrow.

Earth's degrading biodiversity is called a "grand challenge": a global problem which requires "coordinated and sustained effort from multiple and diverse stakeholders

toward a clearly articulated problem" (George, Howard-Grenville, Joshi, & Tihanyi, 2016, p. 1881). Grand challenges, also known as wicked problems, are characterised as problems so big and complicated, no single sector or nation can solve it alone. Grand challenges transcend borders, ideologies, and cultures. The most widely accepted grand challenges are called the Sustainable Development Goals (SDGs).

In 2015, the United Nations (UN) adopted the SDGs, a set of 17 goals "to end poverty, protect the planet, and ensure prosperity" (George et al., 2016, p. 1881). The SDGs governance model is devolved; each country is independently responsible for strategic management, implementation and monitoring progress toward the goals. There is no compulsory monitoring and reporting; it is completed on a voluntary basis. Establishing these global targets was a milestone along society's sustainability journey, however they have been criticised as individuals are largely unaware of the SDGs and/or how they translate into daily life.

In 2020, five years after the SDGs were adopted, the global trends are still going in the wrong direction. Although some progress has been made, it is not enough to achieve the ambitious targets. To meet the 2030 SDG targets, coordination amongst diverse groups needs to be scaled up to an unprecedented level (Hajer et al., 2015). The UN published a guide to maximise the impact of partnerships for the SDGs, which says "collaboration across societal sectors has emerged as one of the defining concepts of international development in the 21st century" (Stibbe, Reid & Gilbert, 2018, p. 6). The UN's collective commitment to the SDGs has created an opportunity for significant innovation and strategic change through collaboration.

Sustainability is championed by the UN as the economic paradigm for the 21st century. Sustainability means meeting "the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1987). Because resources are finite- whether natural, human or financial- resource use must be sustainable (Stibbe, Reid, & Gilbert, 2018). Sustainability has three pillars: ecological, economic, and social. All three of these systems need to work together for a healthy, functioning planet. The sustainability paradigm holds promise for bringing society back into harmony with the natural world.

Managers have a critical role in creating the vision for the future and implementing it in their operations.

Management science is evolving from a world built for industrialisation, competition, and sectors working in isolated "silos", toward a new era of sustainability and collaboration. Traditionally, the economic theory of externalities would suggest that ecological and social issues are outside the scope of the private sector. The purpose of the private sector is to generate profit; the government is responsible for managing public assets; and the community sector are volunteers taking care of whatever the government and/or business does not address. The assumption that the responsibility to fix ecological and social issues sits outside of businesses' scope has caused serious issues across the globe. In reality, economic and social systems operate within the boundaries of the natural world. Therefore, a sustainable future is one that integrates social, ecological and economic systems.

In the 21st century, there is increasing pressure for all sectors to be accountable for their ecological impact. The private sector has a significant impact on nature, yet businesses are still learning how to incorporate biodiversity values into their operations (van den Burg & Bogaardt, 2014). Unparalleled coordination is needed to scale up impact to match the scale of biodiversity loss and eroding resilience. A new approach to cross-sector coordination is needed to scale up SDG impacts.

Cross-sector partnerships (CSPs) provide a potential model to scale up impact on the level of the SDGs by harnessing the power of collaboration. CSPs are defined as "initiatives where public-interest entities, private sector companies and/or civil society organisations enter into an alliance to achieve a common practical purpose, pool core competencies, and share risks" (Gray & Stites, 2013, p. 17). This study will use the term 'cross-sector partnership' (CSP) or 'partnership', although this model can also be called multi-sector collaborative partnerships, cross-sector social partnerships, 'profitable partnerships' or 'shared value initiative' (Hartman & Dhanda, 2018, p. 185).

Businesses are beginning to recognise the potential for CSPs to help build organisational and ecological resilience, while simultaneously contributing to long-term competitive advantage (van Tulder, Seitanidi, Crane & Brammer, 2016). CSPs

offer a strategic approach to deliver novel, innovative solutions for grand challenges via the combination of diverse capacities and resources (van Tulder et al., 2016). Successful cross-sector collaboration could result in increased efficiency and effectiveness in tackling complex problems and increased value to all (Stibbe, Reid & Gilbert, 2018).

The ability of CSPs to deliver scalable solutions to complex problems is known as collaborative advantage. Collaborative advantage describes the concept that a group of actors can deliver more collectively than the sum of their parts (Stibbe, Reid & Gilbert, 2018). The extra value a partnership delivers includes the impact of the partnership "on individuals, organisations, sectors, systems and norms" (p. 11). The value of collaborative advantage is evident in that UN SDG goal 17, which is "partnerships for the goals" as a means of accelerating progress. Inclusion of partnerships as a dedicated goal is a testament to the importance of partnerships, particularly for the type of systems change required by the other 16 SDGs. Although forming partnerships is a powerful strategy to tackle complex problems, in practice, collaboration has proven to be difficult (Gray & Stites, 2013; Bitzer, 2013).

Using a strategic lens, this study is focused on how cross-sector partnerships are working to tackle grand challenges and how can they can be scaled up for increased impact. In this research, existing CSPs will be examined using a cross-case analysis to determine: *How can different sectors collaborate effectively?; What are the frequently identified barriers to effective collaboration?; How do CSPs measure success?; What impacts are being achieved for urban ecology?; and What is different or unique to urban ecology partnerships?* The aim is to demystify cross-sector partnerships, increase uptake and impact, and uncover the latest best practice in strategic management for sustainability. To do this, the synthesis paradigm is applied, more commonly found in restoration ecology and emerging within strategic management.

When problem-solving, science provides two logical reasoning processes: analysis and synthesis. Analysis is a deductive approach to solving problems, where a complex phenomenon is simplified to components to make it more understandable (Schad, Lewis, Raisch & Smith, 2016; Hopp, 2008). For example, to learn about a flower, one could dissect it into its components. This is a deductive approach, which aligns with the

traditional scientific process; the flower is studied in isolation to reduce variables for a more precise, consistent result. Synthesis is the opposite of the analysis approach. A synthesis approach is inductive, which entails mapping a phenomenon in terms of its system, noting context and relationships as important data. Instead of dissecting the flower in isolation, one might observe the flower in its natural environment with the goal of representing its role in the wider ecosystem.

The synthesis paradigm is emerging as a way to solve the increasingly complex problems of the 21st century (Williams et al., 2017). Traditionally, management science is based on a deductive approach to problem solving. In fact, the field of management science was born during the Industrial Revolution with the advent of the assembly line: an example of how breaking down the production process into steps can increase productivity and efficiency (Witzel, 2012). However, in 2020, increasing globalisation has led to a plethora of complex global problems which require complex global management solutions. A synthesis approach, used in conjunction with systems thinking, can be used to frame complex, social problems by mapping the interconnections between ecological, social, and economic problems across temporal and spatial dimensions.

Interestingly, a similar shift toward the synthesis paradigm is emerging within restoration ecology. Restoration ecology is a technique for reversing the world-wide degradation of biodiversity (Clarkson & Kirby, 2016). It has been called “a new paradigm for biological conservation” (Hobbs & Norton, 1996, p. 93). Because ecosystems across the globe are breaking down, the demand for ecological restoration is increasing (Derhé, Murphy, Monteith, & Menendez, 2016). With increasing demand for restoration impacts, a synthesis approach called ‘landscape-scale’ restoration has been developed by Hobbs and Norton (1996). Traditional restoration ecology is ad-hoc and site-specific, resulting in minimal development of general principles that are transferable across diverse sites (Hobbs & Norton, 1996; Pataki, 2015). The landscape-scale restoration approach creates a set of principles and key processes which are scalable and applicable across diverse situations, increasing its transferability. Two key guiding principles are “bigger is better than smaller” and “connected is better than fragmented”.

I argue that the grand challenges are better tackled within a synthesis paradigm, which highlights the context and relationships as relevant data. Aligned with the synthesis paradigm, an inductive approach to theory-building will be used in this study to capture dialogue between diverse stakeholders "so that a 'synthesis' of perspectives can be achieved to inform future action" (Jackson, 2009, p. S29). Since this study addresses the grand challenge of Earth's degrading biodiversity, it is appropriate to incorporate the principles and key processes from landscape-scale restoration to CSPs, which aim to tackle this very problem.

When taking the landscape view and including diverse perspectives on the issue, the strategy becomes more inclusive and scalable across diverse actors in society. When a strategy is more inclusive and scalable, there is greater potential for impact. Systems thinking is a suitable synthesis framework to consider the dynamics and complexity of interconnected human-environment systems (Williams et al., 2017). As McPhearson et al. (2016) posit, "ecological principles are key to transformative change to achieve resilience to climate change and other urban stressors" (p. 198).

The following section reviews the literature on key concepts related to managing for biodiversity, sustainability and impact. Systems thinking theory will be applied to CSPs for biodiversity in New Zealand to assess partnership structure, goals, barriers, opportunities and impact. Therefore, systems thinking theory is an appropriate lens to analyse the partnership as a system, focusing on the relationship with nature and impacts on biodiversity. This research covers new territory by fusing strategic management research with ecological concepts for a more robust understanding of how to successfully manage for biodiversity.

This research contributes to the partnership literature by examining CSPs that aim to resolve complex problems, specifically urban ecology issues. Grand challenges in urban ecology include biosecurity, biodiversity loss, resource management, and the people-nature disconnect, which requires system change to tackle at scale.

Chapter 2. Literature review

Overview

The purpose of this section is to introduce key concepts of urban ecology to understand the people-nature interactions within cities. With urbanisation occurring on an unprecedented scale, the necessities of life such as biodiversity, clean air and water are in jeopardy. Ecological resilience is essential to business continuity and generating long-term value (Gray & Stites, 2013). However, the private sector is struggling with "the complexity of the notion of biodiversity and its relevance for business" (van den Burg & Bogaardt, 2014, p. 178). In the 21st century, it will be imperative for all of society to have a basic understanding of ecological principles, specifically related to the urban ecosystem.

Urban ecology

In the year 1900, 10% of the population lived in cities; today, more than 50% of people live in cities, and this percentage is expected to continue to rise in the 21st century (Grimm et al., 2018). Some countries are more heavily urbanised, such as New Zealand, where 87% of people live in cities (Clarkson & Kirby, 2016). Urban expansion has an inverse relationship with the health of biodiversity (Standish, Hobbs & Miller, 2013). Consequently, the scale of rapid urbanisation has led to an ecological crisis of disappearing biodiversity, disrupted hydrology, pollution and increasing surface temperature. With 90% of the world's urban areas located on the coast, cities are particularly vulnerable to rising sea levels and storms (Acosta, D'Albertas, deSouza Leite, Saraiva, & Metzger, 2018). Growing cities are facing a myriad of complex problems including air, water and soil pollution, resource depletion, and aging infrastructure (Pataki, 2015).

Urban ecology highlights the importance of systems thinking and resilience to urban ecosystems. Resilience thinking is based on the understanding that "humans are inextricably linked with their environment" (Cooke, et al., 2016, p. 831). According to Pataki (2015), building resilient ecosystems "requires a systems-level understanding of

ecosystem complexity, thresholds, and feedbacks" (Pataki, 2015, p.2). It is relatively new territory to apply ecology to urban ecosystems, as ecological theories have historically excluded built ecosystems. Urban ecology research seeks to understand the biodiversity, community structure, energy and mass cycles of the urban ecosystem. Conceptualising cities as urban ecosystems brings a landscape-scale approach to tackling grand challenges such as pollution, biodiversity loss, and increasing the well-being of people (Pataki, 2015). To date, there is not a lot of research on the complex interactions between people and nature within the urban ecosystem.

The relationship between people and nature is being addressed in the field of urban ecology, which integrates data from social and natural science. The people-nature relationship is a key factor in human well-being (Matsouka & Kaplan, 2007). People who live in cities rely on "capacities of ecosystems well beyond their city boundaries" (Grimm et al., 2018, p. 756). To sustain human well-being and quality of life, the ecological footprint of a city is tens to hundreds of times the area it occupies to produce energy flows, material goods, and nonmaterial services, such as waste absorption (Grimm et al., 2018). Although human survival is dependent upon clean air, water and food to survive, people "generally fail to mentally recognize" their dependence on nature. Further, people typically consider the economy to be separate from nature (Cooke et al., 2016, p. 832). This mental separation of economy and ecology perpetuates the disconnection between people and nature.

Communities around the world are beginning to recognise the importance of urban ecosystem functioning, which has led to a restoration boom in the past couple of decades (Hobbs & Norton, 1996; Oldfield, Warren, Felson, & Bradford, 2013). The Society for Ecological Restoration has defined restoration as "a process for the recovery of ecosystems that have degraded, damaged or destroyed…[merging] biodiversity, ecology, spatial, and historical contexts, and sustainable cultural practices" (Lyver et al., 2016, p. 315). Restoration research is an interdisciplinary field as it combines ecological, social, and management theories. Restoration efforts facilitate mutually beneficial interactions between people and nature. When

successful, restoration projects enhance resilience for people, cities, and nature (Matsuoka & Kaplan, 2007).

Ecological restoration has the potential for scalable impact as it delivers ecological, social and economic benefits. Some ecological benefits of restoration include improved air quality, reduced storm water run-off, increased carbon sequestration and increased native biodiversity (Oldfield et al., 2013; Wallace, Laughlin, & Clarkson, 2017; Perring et al., 2015). Socio-economic benefits of restoration include strengthening social cohesion amongst citizens, increasing resilience to climate change (Acosta et al., 2018; Standish et al., 2013) and empowering citizens to speak on behalf of their trees (Endreny, 2018). Other benefits people derive from connecting to nature include increased physical, psychological and spiritual health, more options for recreation, and natural history education (Standish et al., 2013). One example of a successful project is in Seattle USA, where fruit harvests supply food banks (Endreny, 2018). A second example is in Ouarzazate, Morocco, "greenbelts treat wastewater and combat desertification" (p. 3).

Urban restoration, a strain of urban ecology, could be a solution to biodiversity loss and the strained people-nature relationship. According to Perring et al., (2015) restoration ecology operates "at the landscape scale, and in response to changing environmental, economic and social conditions" (p. 1). Ecological restoration projects facilitate positive people-nature interactions, whilst preserving nature for future generations. If restoration is a potential solution to biodiversity loss, what are the opportunities and challenges in urban restoration projects? How does it work, and is it successful? How can restoration efforts be scaled up for greater impact?

Urban restoration

The objective of urban restoration is to create a long-term sustainable state for the project site (Hobbs & Norton, 1996). Large-scale restoration is increasingly urgent as many species face extinction (Hobbs & Norton, 1996). Urbanisation causes significant ecosystem degradation, which pose unique challenges for restoration (Clarkson & Kirby, 2016). Ecological restoration is a continuum ranging from reconstructing completely devastated sites, to the management of relatively unmodified sites. Each

planting site has unique “physical conditions that will influence plant growth” (Clarkson & Bylsma, 2016). According to Endreny (2018), the way forward is to “design landscapes in partnership with the UN SDGs and uphold an international commitment to improving human wellbeing and biodiversity.” (Endreny, 2018, p. 3)

Compared to rural areas, cities face unique restoration challenges including a high concentration of pollutants, the urban heat island effect, extreme fragmentation, invasive species, and social factors (Perring, et al., 2015). The social aspect is unique to urban ecology due to the high concentration of people in cities. Therefore, the people-nature relationship is of greater importance in the urban context. After addressing the challenges, key themes emerging in urban restoration will be covered which are aimed at scaling up impact.

Challenges in urban restoration

Pollutants in the air, water, and soil have contributed to social and ecological challenges that can be difficult and expensive to manage. Each year, the 20 largest cities in USA contribute more carbon dioxide than the entire continental United States can absorb (Grimm et al., 2018). The concentration of transportation and industry in urban areas creates a hotspot for greenhouse gas emissions. Cities have higher acid and nitrogen deposition and elevated concentrations of carbon dioxide, methane and ozone in the atmosphere that have both growth-enhancing and growth-inhibiting effects on organisms (Grimm et al., 2018). Cities are disproportionately located along rivers and coastlines, which has contributed to the health of fresh water and saltwater ecosystems (Grimm et al., 2018). The increased impervious cover, such as roads and buildings, have changed water systems to funnel pollutants from buildings and roadways into streams.

Cities have their own microclimate, called the urban heat island effect (UHI). As Grimm et al. (2018) explain, “cities tend to have higher air and surface temperatures than their rural surroundings” (p. 758). Basically, multi-story buildings trap solar energy like a canyon of high rises. Impervious surfaces and a lack of natural vegetation and waterways amplify the heat trapping effect. The UHI has implications for climate, water resources, air quality, human health, biodiversity, and ecosystem functioning.

Ultimately, the UHI could alter the climate to the extent it is no longer habitable for native species.

In urban areas, there is a high level of fragmentation between natural ecosystems (Grimm et al., 2018). Patch fragmentation is when populations are isolated in a forest fragment, which also means their gene pools are isolated (Thomas et al., 2014). The composition of the species tends to shift towards a more generalist, opportunistic species in urban settings. For example, as urbanisation increases, bird communities shift towards eating more seeds and grains and fewer insects (Grimm et al., 2018). In urban forests, habitat isolation and fragmentation make seed dispersal and germination difficult, which creates an uphill battle for new growth and regeneration. Small urban forests are especially susceptible to the consequences of high fragmentation, such as unstable microclimates and vulnerability to invasive species (Hobbs & Norton, 1996).

Introduced species can limit the success of any restoration effort. For example, herbivores such as deer and possum severely constrain plant growth; omnivores such as mice consume seeds and feral pigs alter the soil structure; and carnivores impact native bird populations, which are important for dispersing seeds for certain tree species. (Norton et al., 2018). Urban landscapes typically contain both native and introduced species (Standish et al., 2013), where the introduced species tend to be aggressive invasive weeds that dominate the landscape and suppress natives (Wallace et al., 2017; Norton et al., 2018).

Some introduced species “have a neutral effect on the native ecosystems they inhabit and can even fulfil important ecological and social functions” (Standish et al., 2013, p. 1216). For example, in New Zealand, gorse is an introduced species that can be an excellent nurse crop for natives, providing shelter and shade to seedlings until the natives are big enough to shade the weed out. Understanding the behaviour of introduced species is critical to successful, efficient, cost-effective restoration.

The social aspects of urban restoration are significant due to their large, condensed populations. Restoration ecology encompasses relationships and network dynamics (Perring, et al., 2015). It is important to understand stakeholder values and incorporate

these into restoration plans, although this can be difficult and time-consuming when stakeholder values conflict (Norton et al., 2016). The social constraints of urban restoration are a lack of ecological knowledge, a lack of social acceptance of management approaches and people-nature conflicts (Clark & Kirby, 2016).

Standish et al. (2013) advise that integrating diverse values, cultures and socio-economic activities should inform restoration planning in cities. For example, stakeholder engagement could benefit New Zealand lizard conservation efforts as Towns et al. (2016) suggest that "the long-term social and economic threats facing lizards might best be approached [using] modern socio-ecological analytical tools to understand public attitudes toward lizards. If we know how the public at key locations view the New Zealand lizard fauna, appropriate messages about the diversity and significance of the fauna can be provided" (Towns et al., 2016, p. 315).

Scaling up urban restoration

Urban restoration researchers have identified several emerging principles to scale up ecological impact. It is important for society to align under these principles to upskill in urban ecology and contribute to meaningful ecological outcomes. Traditional restoration focuses on a single site; however, ecosystems do not operate in isolation, therefore a site should not be assessed in isolation (Hobbs & Norton, 1996). This is particularly relevant to urban restoration where the landscape has been significantly altered and/or fragmented, because ecosystem resilience requires adequate connectivity and gene flow (Hobbs & Norton, 1996). To achieve long-term resilience, the restoration strategy must be considered on multiple scales to fulfil a range of objectives and maximise ecological impact. Once the landscape has been properly assessed, restoration work can be strategically designed to achieve the project goals with the resources available (Lamb, Stanturf, & Madden, 2012).

Two key guiding principles to follow for landscape-scale restoration are "bigger is better than smaller, connected is better than isolated" (Hobbs & Norton, 1996, p. 104). When a landscape has less than 10% of its natural habitat cover, it triggers "a decline is many species with severe fragmentation effects." (Clarkson & Kirby, 2016). Some practical landscape-scale restoration goals could be to provide additional habitat for

native flora and fauna by creating buffer zones and linking fragments with corridors (Hobbs & Norton, 1996). Creating corridors allows for species to move between fragments, thereby increasing the gene pool and population persistence. In the event of danger, such as flooding or fire, corridors provide an escape route for local fauna (Thomas et al., 2014).

Ecological Timelines

Because urban forest restoration is relatively novel, most of the research on restored urban systems is carried out on young projects (circa 5 years old). This is a challenge, as it typically takes 15-20 years for a restored forest site to reach canopy closure, an indication of long-term stability (Oldfield et al., 2013). Without research on long-term progress, it is difficult to evaluate the success of the restoration project and identify best practice methods. Long-term monitoring and quality documentation will improve the efficiency of future projects by providing evidence-based environmental data to decision-makers on the success of the management strategy (Lindenmayer & Liken, 2010). More research is needed over longer timelines, and of older restored sites, to determine the most efficient, cost-effective management methods.

A forest ecosystem is dynamic and exists for hundreds of years or more, yet there is uncertainty about climate change impacts. Establishing larger, more connected forests will improve ecosystem resilience under uncertain circumstances (Crow, 2012). When designing a restoration project, planners should be aware of milestones during the forest's lifespan including critical thresholds in forest development (i.e., canopy closure, microclimate stabilisation), and then map out the desired trajectory (Hobbs & Norton, 1996). A major factor limiting restoration success is the lack of aftercare (Clarkson & Kirby, 2016).

Restoration as a solution

Ecological restoration is an effective technique to enhance biodiversity. In fact, the UN General Assembly has declared 2021-2030 "the decade of ecosystem restoration", which aims to "massively scale up the restoration of degraded and destroyed ecosystems" to enhance biodiversity and protect food and water sources (United

Nations Environment Programme, 2019). A study by Derhe et al. (2016) confirms the effectiveness of restoration by comparing sites over a chronosequence, meaning sites are compared along an age range from 2-17 years since initial restoration. The sites were all originally forest, but had been converted to pasture, and now are being restored back to forest. The projects were compared to see how the restoration efforts impact the site's ecological functionality over time. The study showed that the older the restoration site, the higher the species richness, abundance, biomass and functional richness of the site. The findings provide empirical evidence that forest restoration is an effective approach to reverse biodiversity loss and enhance ecosystem functioning in a relatively short timeframe.

Ecological restoration is a valuable investment in economic terms. A 2018 brief, published by the United States Forest Service, states every $1 invested in urban trees will yield annual benefits averaging $2.25 (USDA Forest Service, 2018; Endreny, 2018). A quantitative study by Endreny et al. (201t) attempts to quantify the benefits of urban forests by analysing the value of trees in cities. Data was compared from 10 megacities (population of at least 10 million people) to determine the value in ecosystem services based on existing tree cover. Some of the ecosystem services provided by trees include reductions in air pollution, stormwater, carbon emissions, and building energy use (Endreny et al., 2017). The results, calculated in US dollars, show that each year, tree cover delivers an estimated $482 million in reductions of pollutants, $11 million in avoided stormwater processing, $0.5 million in building energy savings, and $8 million in carbon sequestration.

Scaling restoration efforts have the potential to reverse biodiversity loss trends and impact other grand challenges. Endreny (2018) posits that strategically growing an urban forest will advance nine of the SDGs including "no poverty, zero hunger, good health and well-being, clean water and sanitation, affordable and clean energy, decent work and economic growth, climate action, life on land, and sustainable cities and communities" (p. 1). Collectively investing in restoration could be a viable path to achieving the SDGs 2030 targets.

It is well known that nature is essential for human wellbeing, however there is uncertainty about how human wellbeing is interconnected with nature (Pataki, 2015).

The benefits people receive from nature are called ecosystem services, which can be classified as cultural (eg. spiritual, recreational), regulating (eg. climate, erosion control), supporting (eg. pollination, soil formation), and provisioning (eg. food, water, fibre) (Endreny, 2018). On the flip side, ecosystems also have effects that are damaging to human well-being, which are called ecosystem disservices. Examples of ecosystem disservices are resource depletion, pollution, biodiversity loss and negative health outcomes (Pataki, 2015). The relationship between ecosystem services and human well-being is an understudied topic in ecological science (Von Döhren & Haase, 2015).

Systems thinking theory

Systems theory, also called systems thinking, is valuable to tackling grand challenges. It provides a framework to study dynamic relationships between social, economic and ecological systems to determine the behaviour of the wider system (Williams et al., 2017). Systems theory was first developed around World War II, when scientists from different disciplines needed to work together quickly and efficiently on vital military problems (Jackson, 2009). Whiteman, Walker, & Perego (2013) posit that the application of systems theory to strategic management has been inadequate despite its' value in contributing to the complex, non-linear nature of problems. To advance management science, research needs three things: a strategic focus, an interdisciplinary perspective, and an emphasis on realistic human behaviour (Hopp, 2008).

Systems thinking is an interdisciplinary, synthesis-based approach to problem-solving, which can be applied to fuse concepts from urban ecology and strategic management. Cities worldwide are facing grand challenges, such as climate change or biodiversity loss, which "emerge from complex systems in which…relationships are either unknown or highly uncertain and have multiple stakeholders with strongly held and conflicting values related to the problem" (Dentoni et al., 2015, p. 36). In urban ecology, the people-nature relationship is a gap that needs to be addressed. Systems thinking emphasises the importance of context and connections to achieve the desired outcome.

Rather than focusing on a technical solution, the systems approach focuses on interactions between stakeholders and the wider system to achieve system change. A systems perspective enables the researcher to study dynamic relationships within a system by analysing the interactions and impacts between diverse stakeholders to achieve the SDG targets (Dentoni et al., 2015). Ultimately, this study will contribute a new perspective on how businesses could integrate biodiversity into strategy for project success, ecological resilience and scalable impact. Taking a broad systems perspective empowers managers to make decisions consistent with the long-term goals of an organisation and the system as a whole.

One of the first academics to publish research about systems thinking criticised the continuing specialisation within academic disciplines (Boulding, 1956). Boulding theorised that "the more science breaks into sub-groups, and the less communication is possible among the disciplines", the more likely the total growth of knowledge is being stalled by the lack of relevant communications (Boulding, 1956, p. 198-9). By collaborating across disciplines, knowledge is more efficiently distributed and accessible (Sterman, 2001). Increasing collaboration increases the pace of innovation as people share learnings and "build on each other's insights" (Bitzer, 2017, p. 12). Further, as participation increases, so does the potential for impact. The system approach is useful to create system change by identifying positive and negative feedback loops which contribute to the problem and manage unintended consequences (Williams et al., 2017).

Framing CSPs for biodiversity within a systems approach captures the complex, dynamic relationships between people and nature. Partnerships are complex systems which "feed back into the wider system and context which they intervene" (Probst, Faul & Karakulak, 2017, p. 44). A systems approach can account for longer time horizons, providing an opportunity to assess the changes over time in specific contexts. As the SDGs are focused on pursuing economic, social and ecological sustainability, systems thinking can be applied to recognise limitations to growth within these parameters. Using a system thinking lens, "sustainability is the ability of systems to persist, adapt, transform or transition in the face of constantly changing conditions" (Williams et al., 2017, p. 871). To understand sustainability from a systems thinking

perspective, the key concepts are interconnectedness, feedback loops, and adaptive capacity. These terms apply to both urban ecology and strategic management.

Interconnectedness

Understanding the interdependence between people and nature is a vital component of business functioning. Since the 1990s, strategic management scholars have recognised that business operates within a larger, more complex system, and there are biophysical limitations on business actions (Starik, 1995). Nature, its systems, and all "living and non-living components, can be considered stakeholders by all organisations, since all organisations significantly affect or are significantly affected by these entities" (Starik, 1995, p. 215). Therefore, managers are obligated to understand their organisation's relationship with its natural environment. The organisation can develop an enhanced sensitivity to its relationship with nature by treating biodiversity as a stakeholder.

Once nature is elevated to stakeholder status, it begins to receive managerial attention. Currently, the concept of a "stakeholder" refers strictly to human entities, defined as any individual or group that affects or is affected by organisational policy (Starik, 1995). Limiting the definition of stakeholder to "people" perpetuates the people-nature disconnect. It implies that only people can impact business and vice versa, which can lead to damaging relationships and unintended consequences for people, nature and business. Starik (1995) proposed the following inclusive definition of stakeholder: "any naturally occurring entity which affects or is affected by organisational performance" (p. 216).

Managers can improve their impact on biodiversity and ecosystem function by applying stakeholder principles to non-humans. As Starik's (1995) stakeholder management approach suggests, the organisation can map itself in relation to the wider system including relevant stakeholders, inputs, and relationships including the organisation's dependence and impact on nature. The context and connections within the system can be reframed to achieve a long-term, strategic goal. This process is normally reserved for human entities, however by considering biodiversity as a

stakeholder, interactions between the organisation and nature can be proactive and synergistic.

Feedback loops

Business relies on nature for inputs, and conversely, nature is impacted by business through feedback loops. Feedback loops are the effects and side effects of one variable on another; they can be positive or negative (Williams et al., 2017). The distinction between positive and negative feedback loops is their response to change. Positive feedback loops amplify the change, while negative feedback loops reduce the change (Sterman, 2001). For example, spending more quality time with a person allows trust to build and enables the relationship to grow. In contrast, negative feedback loops are responsible for maintaining a steady, stable state. For example, refraining from buying single-use products means less waste goes to landfill. It is critical that managers understand feedback loops as they actively create and react to them (Williams et al., 2017).

In a study about enhancing the impact of CSPs, feedback loops are identified as impact loops (van Tulder et al., 2016). Because one of the main issues in CSPs is ambiguity in language, it is important to clarify the difference between outputs, outcomes and impacts. Outputs are the immediate effects on participating organisations, outcomes are the medium-term effects on the targeted communities, and impacts are the long-term effects to society on a systems level (van Tulder et al., 2016).

From a systems perspective, efforts should be directed to change dynamics from adversarial to synergistic. In strategic management vernacular, this is similar to the concept of transitioning from competitive to collaborative. This is very similar to the principle posed by Hobbs and Norton (1996), from fragmented to connected. Systems thinking can be applied to determine points of intervention for the desired change and to mitigate unintended consequences (Williams et al., 2017). When non-human entities are included as stakeholders, an adversarial relationship with nature can be transformed into a synergistic relationship. Collaborative relationships are more productive than adversarial relationships (Hartman & Dhanda, 2018).

Adaptive capacity

Adaptive capacity is the ability to survive in changing conditions (Dentoni et al., 2016). Adaptive capacity includes resilience, which is the amount of change a system can withstand while maintaining its basic structure and function (Williams et al., 2017). To build adaptive capacity, managers will continuously learn from their experiences and adjust as necessary. Adaptive capacity can be built through transformative learning processes such as dealing with change, enhancing diversity, and system-level learning. Adaptive capacity leads to new and innovative business models, and solutions to complex problems can emerge (Widener, Gliedt & Hartman, 2016).

Adaptive capacity can be measured by interpreting managerial actions through a dynamic capabilities' lens. Dynamic capabilities are defined as "the ability to integrate, build, and reconfigure…to address rapidly changing environments" (Teece, Pisano & Shuen, 1997, p. 516; Widener et al., 2016). Dynamic capabilities are important, because they enable actors to "anticipate, react, harmonize, or somehow address the requests and concerns of a wide range of stakeholders" (Dentoni et al., 2016). To build dynamic capabilities, the strategy is to proactively identify stakeholder needs, perspectives, and constructively resolve conflict and opposing viewpoints.

When applied to stakeholder management, dynamic capabilities increase the potential benefit to the organisation and its stakeholders. The potential benefits to business include strengthening interactions and relations with stakeholders, adaptively learning from stakeholders to improve its own management strategies, and dynamically co-create social innovation (Zollo, 2017). As the organisation builds its dynamic capability for stakeholder management, it will increasingly make the "right" decision that leads to value creation and social innovation. Dentoni et al. (2016) argue that organisations with strong stakeholder management are better suited to tackle grand challenges. An organisation's success in building dynamic capabilities is dependent on the alignment of "partners' collaborative approaches and actions via a sustainable partnership platform" (Zollo, 2017, p. 26). The co-creation of dynamic capabilities to manage stakeholder enhances the effectiveness of cross-sector collaboration to create system change and societal impact.

Business and biodiversity

Management research has the potential to advance the SDGs and other complex global problems (Hoffmann & Georg, 2012). Business has a significant impact on nature through its use of natural resources, waste creation and pollution. Managers are best placed to address the SDGs as they are typically responsible for designing and implementing organisational strategy (George et al., 2012). Urban restoration practitioners are the strategic managers of their projects. They manage competing goals, balance ecological and profitability objectives, manage risk, apply the latest science, and perform ongoing monitoring. The interactions between business and biodiversity are one example of the understudied people-nature relationship. According to Whiteman et al. (2013), integrating ecological theory and data into management science could help to operationalise sustainability within the private sector.

From a management perspective, biodiversity loss is already eroding organisational resilience. Organisational resilience is defined as "positive adjustment under challenging conditions such that the organisation emerges…strengthened and more resourceful" (Nilakant et al., 2014). Nilakant et al. (2014) studied the organisational performance of four large organisations in Christchurch New Zealand after the city faced a series of devasting earthquakes. The following four themes were found to contribute to resilience: staff wellbeing and engagement, collaboration, leadership and learning. Leadership and staff engagement facilitated the opportunity to *create* adaptive resilience, "whereas collaboration and learning are needed to *sustain* it." (Nilakant, et al., 2014, p. 5). In short, an organisation can enhance and sustain its organisational resilience by improving internal and external collaboration coupled with a willingness to learn.

The case of Unilever's fish sticks is an illustrative example of how business is vulnerable to biodiversity loss. (Winn & Pogutz, 2013). Unilever is a global consumer goods company which sold frozen fish sticks made from cod. In the 1990s, cod stocks abruptly diminished due to over-exploitation. After frantically trying to replace the cod with another fish, consumers rejected the replacement product. Fish sticks were

discontinued, negatively impacting profitability for years to come. This example demonstrates the value of investing in the business-biodiversity relationship through management.

Strategising biodiversity

Businesses can capture competitive advantage and build resilience by including social and ecological values in their strategies (van Tulder et al., 2016). For example, an organisation can focus on reducing its pollution and improve well-being for human health at the same time (Endreny et al., 2017). The SDGs have been criticised as a top-down approach to global governance, which has limited relevance for those outside of government. Hajer et al. (2015) call for a reframing of the SDGs to "mobilise new agents of change such as business, cities and civil society" and clarify targets for preventing further biodiversity loss (p. 1652). Two concepts are identified to make the SDGs more accessible to non-government sectors: planetary boundaries and the energetic society. These concepts are important for CSPs to conceptualise how their strategy links to urban ecology impact.

The planetary boundaries (PBs) provide the public with a science-based analysis of the health and stability of the planet using key indicators. The framework provides robust evidence for the current health of the planet. The PBs consist of nine indicators of planetary health to serve as a dashboard report, which is updated and refined on an on-going basis (Will et al., 2015; Hajer et al., 2015). The dashboard helps to communicate the urgency of ecological issues and makes scientifically robust data accessible. Unfortunately, several of the ecological boundaries have been transgressed, specifically biodiversity loss (Will et al., 2015; Hajer et al., 2015).

With biodiversity loss already outside of the safe operating space, rapid action is necessary to shift investment towards urban ecology impacts. The Stockholm Resilience Centre publishes research related to the nine PBs, one of which is the "loss of biosphere integrity", including "biodiversity loss and extinctions" (Stockholm Resilience Centre, 2020). In 2005, the Millennium Ecosystem Assessment "concluded that changes to ecosystems due to human activities were more rapid in the past 50 years than at any time in human history, increasing the risk of abrupt and irreversible

changes". With increasing demand for food, water and natural resources, the rates of biodiversity loss can be slowed by efforts to protect and enhance natural habitats, and improve connectivity between ecosystems (Stockholm Resilience Centre, 2020).

Scaled up cross-sector coordination is required to achieve the transformational change of the 2030 SDG targets. The "energetic society" describes the transformative potential of increasing collaboration across a broader group of actors to focus and accelerate action (Hajer et al., 2015). Like nature, the economy thrives on diversity and synergy, not monopoly. A review of 146 CSPs for ecological outcomes found that "firms with innovative orientation and alliance experiences tend to choose a more diverse set of partners (especially cross-sector partners)" and in turn, partner heterogeneity moderates a partnership's ecological strategy outcomes (Lin, 2012). To tackle grand challenges, an article in the Harvard Business Review advised "businesses must foster and participate in multisector coalitions" (Kramer & Pfitzer, 2016).

Cross-sector partnerships for urban ecology are a mechanism to enhance biodiversity and the people-nature relationship. To unleash the power of the energetic society, diverse actors from every sector need guidance to enact sustainable strategies and practices. Specifically, the SDGs need to tap into the business community as powerful agents of change. More studies are needed which analyse the connections between people, cities and nature. Research into cross-sector collaboration contributes to the understanding of the people-nature relationship over time (Pataki, 2015).

Cross-sector partnerships

To scale up the desired impact, organisations can collaborate with others in pursuit of ecological outcomes. When organisations collaborate across the government, industry and community, they have the potential of combining the management capacity of all three sectors, thus transforming into a proactive, socially responsible relationship with nature (Starik, 1995; Bitzer, 2017). CSPs are "intensive, long-term interactions" (Clark & Crane, 2018, p. 303), which include participants from at least two different sectors (public, private and community), in a collaboration to solve economic, social and ecological issues by combining resources (van Tulder et al., 2016)).

CSPs have been called “the collaborative paradigm of the 21st century” (van Tulder et al., 2016, p. 1; Austin, 2000; Gray & Stites, 2013). It is expected that the combination of resources and capacities from actors across sectors will deliver improved and innovative solutions to unwieldy, complex problems. When diverse participants collaborate, the whole is greater than the sum of their parts (Stibbe et al., 2018). In other words, when diverse stakeholders coordinate, the combined efforts have the potential for system change. Partnerships are a scalable solution to complex problems; partnerships evolve over time and get stronger as they grow in membership.

It is important to note the distinction between partnership and collaboration. A partnership is a non-hierarchical, committed relationship, which operates under a high degree of transparency, accountability and trust (van Tulder et al., 2016). In contrast, collaboration is a process that partnerships use to coordinate and execute their goals (Gray & Stites, 2013). Collaboration is measured on a spectrum, with transactional relationships at the low end and full partnership at the high end (Hartman & Dhanda, 2018). In order from basic to advanced, partnerships can be reactive, transactional, integrative or transformational (Stibbe, 2018).

The extent of collaboration increases with each level, and each level yields a different type of relationship between parties (Stibbe, 2018). The first level is considered “transactional,” which describes a relationship where the parties exchange services at a point in time. Conventionally, corporate social responsibility is largely transactional, mostly in the form of philanthropic donations, which is the most basic form of collaboration (Gray & Stites, 2013). The next level on the collaboration spectrum describes when the parties combine and integrate their resources and expertise, co-manage operations and governance. For example, creating industry standards for health and safety outcomes or ecological outcomes. This access to expertise assists organisations to resolve conflicts, boost employee morale, and can improve reputation and competitive advantage with eco-conscious customers (Grudinschi et al., 2015).

The highest level of collaboration is partnership, where transformative change is possible. Transformational partnerships involve collaborative governance and have the capacity to deliver wider societal impact. This is only possible with widespread coordination of activities across the system to co-create transformational change.

According to Clarke and Crane (2018), CSPs “can enhance system-level governance of social and environmental problems” (p. 304). Businesses that participate in CSPs capture benefits such as strengthening community relationships, gaining access to political and strategic insights and technical information.

How to collaborate effectively across sectors

This section explores how to nurture CSPs to flourish on multiple levels and achieve the desired system change. CSPs have been described as a new form of global governance (Hartman & Dhanda, 2018). Synergies are created when diverse actors align their resources and capacities. If successful, CSPs can co-create social value “coping with their individual differences and developing a sustainable alignment of organizational cultures” (Zollo, 2017, p. 25). One study found that sharing common goals and values is “imperative to the survival of cross-sector partnerships, while dependence on each other’s resources is of lesser importance” (Lassonen, 2017, p. 21). Over time, the CSP “can enhance system-level governance” of social and ecological problems (Clarke & Crane, 2018, p. 304).

A high level of transparency, approaching the partnership with fairness and honesty, builds mutual trust and accountability. Three principles for high-performing CSPs should include equity, transparency, and mutual benefit (Zollo, 2017). Treating partners with equity means recognising every partner’s values and jointly making decisions. Shared values between partners increase trust and commitment (Laasonen, 2017). When a partnership is successful, the partners share the risk and benefits toward their goals. In a CSP, partners co-design strategy and coordinate their activities for maximum impact. The CSP is a platform for partners to influence the wider industry and society. This type of partnership requires a lot of effort in coordination between stakeholders and a lot of internal culture shift.

By combining the resources and capabilities of different sectors, CSP participants can capture collaborative advantage and deliver extra value. Collaborative advantage is defined as the “alchemy that allows a group of actors to collectively deliver more than the sum of their input.” (Stibbe, Reid & Gilbert, 2018 p. 11). It is the intrinsic reason why the “partnership approach can deliver solutions and impact beyond that of a

single actor, or actors working independently" (p. 11) The extra value delivered by a partnership is called the partnership delta (ΔP). ΔP describes the collective impact of the partnership over space and time, which includes the impact on "individuals, organisations, sectors, systems and norms" (p.11). A key impact of CSPs is the co-creation of resources through engagement, sharing knowledge, and inter-organisational learning (Dentoni et al., 2016). These processes are similar to the urban restoration.

The socio-economic aspects of restoration should be carefully considered as the level of collaboration has a significant impact on the success of the project. When stakeholders are engaged early on, disagreements will be identified and managed early on (Lamb et al., 2012). The perspectives of scientists, statisticians, policy-makers, and resource managers are all important when planning, monitoring, and executing a restoration plan (Lindenmayer & Liken, 2010). It is critical to consult a diverse group of stakeholders, because the greater the engagement, the greater knowledge exchange and co-production (Acosta et al. 2018). Ultimately, the stronger and more diverse the CSP membership, the greater potential for impact.

When organisations collaborate for shared value and social innovation, a hybrid culture is forged that is distinctive from any individual stakeholder. The hybrid culture is developed over time through shared decision-making and a quality evidence-base, influence, advocacy, accountability and mutual learning (Zollo, 2017). The hybrid culture enables diverse stakeholders to align under the common goal, providing an opportunity for innovative, transformational solutions through collective effort. To maximise the value of the CSPs, the organisation policies and culture must keep up with the pace of change (Zollo, 2017). Otherwise, the organisation may hinder the effectiveness of the CSP.

Selecting the right partner is crucial to success (Hartman & Dhanda, 2018). Gray & Stites (2013) identify eight key characteristics to consider when evaluating a potential partner: (1) resource profile, (2) previous partnership experience, (3) sector, (4) stakeholders representation, (5) power dynamics, (6) cultural fit, (7) time horizons for activities and (8) reputation. Participation in CSPs require certain competencies to

navigate complexities of partnerships, such as conflicting interests, perspectives and objectives.

Because CSPs are relationship-based, they require a certain type of person. CSPs "commonly call for every member to assume a leadership role – whether in small or large-scale dimensions." (MacDonald & Stadtler, 2017, p. 45). After an analysis of academic and practitioner resources on CSPs, four critical skillsets emerged: interpersonal, communication, entrepreneurial and systems thinking (MacDonald & Stadtler, 2017).

Barriers

Ecological issues are increasingly important to stakeholders with pressure building for business to address their impacts on nature (Grudinschi et al., 2015). The UN Secretary General Antonio Guterres said the coronavirus pandemic is the biggest challenges the world has faced since World War II, however the planet's "unfolding environmental crisis" is an "even deeper emergency (BBC News, 2020). The Secretary General says "money must be used to make people and societies more resilient to climate change". New jobs and business through a "clean, green transition", tying taxpayers' money to "achieving green jobs and sustainable growth". The world needs to collaborate and account for climate risk into the financial system, making it the heart of all public policy.

The temporal element of CSPs and urban ecology must be acknowledged, as they require long-term planning and ongoing evaluation. Partnerships are described as a "journey" (Stibbe et al., 2018, p. 22). It takes time to evaluate and adapt strategy, which shapes how CSPs may respond to complex problems for the desired impact. With the UN decade of restoration commencing in 2021, it is useful to understand how CSPs are currently working to tackle ecological grand challenges, such as global biodiversity loss.

To achieve impact for nature, timelines need to be on an ecological scale, which could be hundreds of years or more. Lindenmayer and Liken (2010) define long-term monitoring as "repeated field-based empirical measurements…collected continuously and then analysed for at least 10 years" (p. 1318). The long-term commitment of urban

restoration projects poses a barrier to practitioners. Practitioners cannot commit to the long-term monitoring required for years or decades. Stakeholders must develop institutional arrangements to ensure monitoring continues over a longer time span (Walters & Holling, 1990).

One of the persistent challenges of CSPs is how they can lead to unexpected conflict for all parties. A common problem in cross-sector collaboration is that partners misunderstand the motivations and intent of each partner (Grudinschi et al., 2015). There is a stigma that the private sector is self-serving and pursues profit at the expense of social and ecological well-being. Tension has been increasing between sectors about corporate social responsibility (CSR) since the term was defined in 1975 (Hartman & Dhanda, 2018, p. 183). Adversarial tension is risky for business since it jeopardises the social license to operate. Business participation in CSPs can counteract this stigma as they demonstrate commitment to deliver benefits to the wider community instead of special interests (van Tulder et al., 2016).

Tension is uncomfortable for managers, but it is also an opportunity for creativity, joint problem-solving and transformational change. Recent research shows that inherent tension can be channelled into a creative tension that enables successful collaboration. Successful collaboration ultimately "increases capacity to deliver innovative outcomes and shared value (Laasonen, 2017, p. 21). Consequently, businesses are increasingly motivated to participate in CSPs to deliver societal impact.

Partnership effectiveness is extremely challenging to study because of the changing and evolving nature of partnerships. As pointed out by Kolk et al. (2019), there are no control groups, and there are no consistent measurements and indicators. It is hard to find data about effectiveness since there are few long-term studies of CSPs (Marques, 2017). Without data, it is difficult to prove that the CSP is achieving its goals or contributing to wider impacts on society. In the CSP corpus, there are many studies on the benefits to partners; however, there is a need for more research which assesses the societal impact of the partnership (Lassonen, 2017). Most previous research has been on small partnerships (Clarke & MacDonald, 2019). Additional studies are needed about how to scale up effective partnerships.

Measuring effectiveness

Measuring partnership success is not easy. It is well-known that the attribution problem, the challenge of isolating impacts directly from the CSP, which makes it difficult to claim CSP impact on a system level (van Tulder et al., 2016). The more complicated the issue, the harder it is to separate CSP impacts from other contributing factors. This is exacerbated for CSPs as many partnerships commence quickly with little to no formal planning or consideration of desired outcomes and impacts (van Tulder et al., 2016). However, it is important to know whether the CSP is effective in addressing the intended goals. The value of monitoring is twofold; it ensures the project is continuing toward its goals, and provides an opportunity to evaluate the plan.

Monitoring is an instrument to track project efficiency and effectiveness, which CSPs need to report on impact. Measuring efficiency provides data for partners to design appropriate interventions to achieve the desired impact. On the other hand, measuring effectiveness provides evidence that the partnership is actually contributing to the social issue (van Tulder et al., 2016). Monitoring the system performance and feedback loops enables managers to make informed, strategic decisions to stay on track for long-term goals, and therefore increases competitiveness, resilience and survival (Williams et al., 2017).

Norton et al. (2018) advise “monitoring should be simple, yet scientifically robust” (p. 9). Lindenmayer and Liken (2010) suggest that the monitoring regime should be developed using a question-based approach “guided by a conceptual model and rigorous study design” (p. 1319). The partners collectively create a model of the ecosystem’s key relationships, and pose key questions about how to best reach the desired objective. Once the key questions are agreed, progress is monitored, and that data can be used to inform future projects.

To investigate how to enhance the impact of CSPs, this study will apply the partnership monitoring and evaluation framework (van Tulder, 2016). The partnership monitoring and evaluation framework captures the dynamic nature of CSPs by factoring in the element of time. This is important because it takes time to build relationships and deliver outcomes, and CSPs can be achieving impacts on multiple levels at any point in

time. The four feedback loops are each an “order” of impact because the impact is magnified with increasing order.

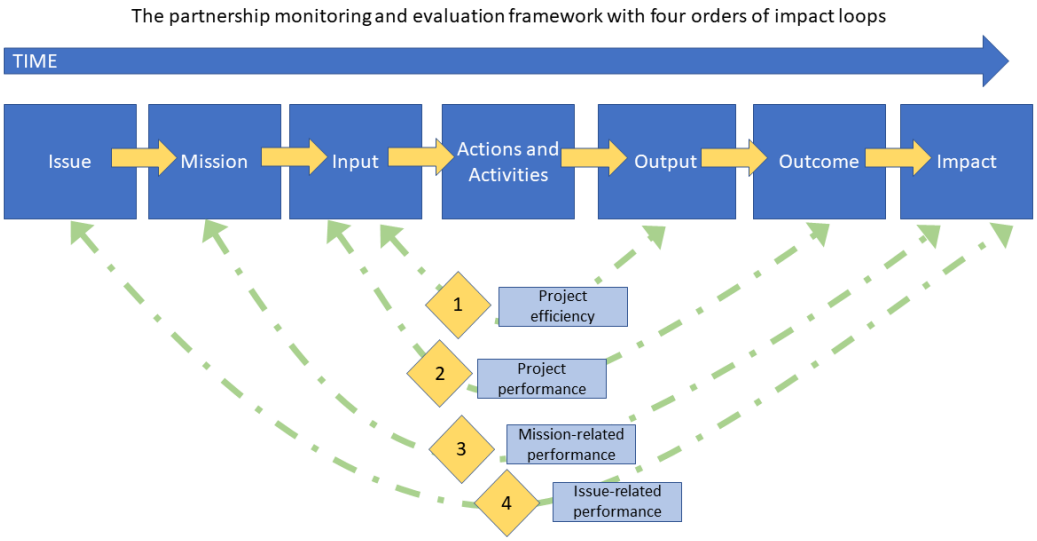

Figure 1: The impact value chain framework above is applied to classify how partnership strategy and activities lead to impact by including the four orders of impact loops (adapted from van Tulder et al., 2016).

The basis of the framework is the impact value chain, which frames the CSP process into seven stages from issue to impact (see Figure 1 above). It is important to clarify the language in the CSP field, which will help demystify CSPs for a broad audience. On top of the impact value chain, the partnership monitoring and evaluation framework identifies four feedback loops to monitor CSP performance and impact. The partnership monitoring and evaluation framework clearly defines the relationships between issue, mission, input, output, outcome and impact.

The key terms of the impact value chain as defined by van Tulder et al. (2016) are: mission, issue, inputs, activities and actions, outputs and impact. The *issue* refers to the complex problem being addressed. The *mission* is the partnership’s link between the issue and the input. This could be in the form of a high-level strategic goal. The *inputs* are the resources and capabilities provided to the partnership to achieve the mission. The *activities and actions* are the actual dynamism and implementation of the partnership strategy. Activities include strategic processes such as governance, accountability, transaction costs, decision-making structures and power. *Outputs* are

the partnership deliverables, which should be measured against the objectives. The *outcomes* are the benefits to individuals, communities, and/or the wider society. Finally, *impacts* are the system changes, which are long term effects of the partnership on the partners, stakeholders, and the system at large. Impact refers to the highest level of impact attainable, which is large-scale system change.

Table 1: Summary of the four orders of CSP impact adapted from van Tulder et al. (2016)

#	Impacted group	Benchmark	Influence (examples)	Stage of plan
1	Individual, partners	Project efficiency	Mindsets, employee engagement	Changed input and activities
2	Organisation and partners	Project performance	Legitimacy, institutionalisation, management tools	Changed output and outcome
3	Partnership	Mission-related performance	Synergistic value creation	Changed outcome
4	Society, issue-level	Issue-related performance	System change	Changed impact

To identify CSP impacts consistently, see Table 1 above to see how each order of impact is classified. On the lower end of impact, the 1st and 2nd order impacts are relevant internally to the CSP. The first order impact loops aim to measure the impact of the partnership based on the internal value-added by combining inputs. The benchmark for success is the operational efficiency due to changed inputs and activities, such as increased participation and resources. An example of a 1st order impact for an organisation is "greater employee engagement and changed mindsets" (van Tulder et al., 2016, p. 11). Second order impact loops capture the internal value added between inputs and outputs (van Tulder, 2016). The benchmark for success is the tactical performance of the CSP, which measures quality of project outputs. Some

examples of 2nd order impacts are increased legitimacy of the project internally and externally, institutionalisation of the partnership practices, and the implementation of successful partnership management tools.

The 3rd and 4th orders of impact are at a much greater scale, which measures the CSP impact on stakeholders outside of the partnership, aimed at wider society. The mission-related performance addresses how well the partnership addressed its goal (van Tulder et al., 2016). The mission could be strategic and long-term, such as a 500-year biodiversity strategy. Equally, the mission could be temporary and tactical, such as a collaboration to create a brochure to inform the community about local ecology. This makes the framework generalizable and scalable as it could apply to any CSP project. The highest level of impact is the 4th order, the impact on society and the issue. The issue is the grand challenge which the CSP is trying to address through its mission. The ultimate 4th order impact is system change. The benchmark for success is the level of innovation achieved by the partnership.

Like CSPs, restoration projects need to demonstrate their effectiveness to justify the use of resources and improve best practice (Derhe et al, 2016). However, in most cases, monitoring is done as a one-time follow up after planting to document ecological structure (Nilsson et al., 2016). A single follow-up fails to capture the long-term success of the restoration project and management strategies. Restoration practitioners need access to long-term data to evaluate progress against the goals. Access to data enables managers to reflect and modify the plan based on learnings, a practice called adaptive management (Nilsson et al., 2016).

In urban restoration, adaptive management is a key technique for managers to stay on track for long-term success. Adaptive management is a method in which on-going evaluation enables the practitioner to learn from their failures and change tact as needed (Endreny, 2018). Not only does adaptive management keep the project on track for success, it also ensures efficiency (Hobbs & Norton, 1996). Hence, when facing uncertain and changing conditions, adaptive capacity allows for effective management of the disruption.

CSPs for urban ecology

The grand challenge of biodiversity loss needs to be tackled with urgency. Traditionally, restoration has been done piecemeal, with smaller groups working in isolation. However, urban restoration is dependent upon strong collaboration between a wide variety of stakeholders in the long term (Endreny et al., 2017). CSPs appear to be an ideal strategy to scale up urban restoration impacts. A familiarity with the systems perspective and the ability to analyse relationships between various components is important for managers and ecologists alike.

Systems thinking theory has been applied to integrate social, ecological and economic systems into one model, providing a framework for understanding the complexity of CSP dynamics. The value of systems thinking in CSP research is to uncover existing approaches within CSPs, and identify the patterns that lead to success. Systems thinking enables the dynamics between people and nature to be examined. As Pataki (2015) points out, the precise dynamics that occur between people and nature remain "elusive at key spatial and temporal scales" (p. 2). By documenting and sharing the knowledge and expertise of CSP participants, the emergent CSP strategy will be more accessible to practitioners. The goal of the study is to identify a strategic management strategy that is simple and cost-effective, yet has the scalability to achieve the system change.

By comparing diverse cases of CSPs for urban ecology, higher level and more generalisable insights can be uncovered. Strategic management and urban ecology concepts will be merged to enable managers across sectors to incorporate biodiversity into their strategies. This study will therefore fill a gap by comparing six current case studies to understand the broader impacts of CSPs for urban ecology. Further, it will provide practical advice on how to collaborate effectively to scale up impacts for urban ecology, and other complex problems.

Chapter 3. Methodology & method

This study explores the phenomenon of CSPs to tackle the grand challenge of biodiversity loss, specifically: *How do cross-sector partnerships achieve positive impacts on urban ecology? Are they effective and what impact are they achieving?* To answer these questions, a qualitative approach is employed by examining existing cross-sector partnerships focused on urban ecology in New Zealand. Inductive reasoning was applied to generate theory using a cross-case analysis to compare perspectives about cross-sector partnerships. This study has an emphasis on using a heterogeneous range of participants across roles and sectors for maximum generalisability of the findings. The research questions will provide the analytical framework to examine the data thematically, specifically looking to identify existing CSP barriers and opportunities, and key factors related to success and impact.

Epistemology

When it comes to research, knowledge and theory-building, I am drawn to the subjective end of the spectrum. I believe that reality is a product of the human mind, therefore knowledge is personal and experiential (Cunliffe, 2011). My personal interest in sustainability and management fuels my research interest, and the data collected was filtered by my unique lens. Based on my view of reality, I applied an interpretivist approach to explore the subjective perspectives of participants in CSPs for urban ecology to get a richer, more robust understanding of the context.

In my personal life, unrelated to this research, I have participated in CSPs for urban ecology impacts. I have participated as a member of community and government, but not the business perspective. Interestingly, the private sector has not been a player in any CSP I have personally participated, which fuels my interest in this research. Part of the aim of this study is to demystify CSPs for urban ecology and encourage uptake. I do not have any pre-conceived notions about the answers to the research questions. As a practitioner, I am genuinely motivated to uncover deep, meaningful insights to accelerate progress.

Methodology

This study uses qualitative methodology to understand how CSPs for urban ecology function effectively and what impacts are being achieved. In CSP research, a rich understanding of the context was important to uncover valuable findings. Qualitative case study research recognises the empirical value of subjective data gathered from multiple diverse perspectives. By studying the perspective of participants, CSPs can be investigated in a way that quantitative research would find difficult to measure.

The interpretivist stance gives meaning to the "artful practices of everyday life", which will help to refine the understanding about CSPs for urban ecology (Cunliffe, 2011, p. 145). In this worldview, each perspective can be considered a "truth", and the truth is constructed in everyday interactions. Therefore, the researcher must collect data from participants about their experiences over time to understand their reflexive relationship with the world around them.

In management science, there is a field of research called business and the natural environment that infuses "business strategy with knowledge from natural science, specifically ecology", however "the emerging practice is well ahead of research in this area" (Winn & Pogutz, 2013, p. 203). This is typical in management research, because practitioners manage complex problems daily, refining their own practice over time like a longitudinal study. Iacono, Brown and Holtham (2009) describe a practitioner's work as "the art of management science in action", as they actively implement and manage change on the ground (p. 42). To bolster credibility, this study was conducted in close interaction with practitioners who have direct experience with the phenomenon of interest.

Case studies provide an empirical inquiry to investigate a contemporary phenomenon in a real world setting where the boundaries of the phenomenon and context are unclear (Yin, 2017). Relationships are not tangible; they exist through the eyes of the subject. Therefore, it is important to understand context when investigating the link between CSP effectiveness and the broader impact on the individual, the organisation, and wider society. Iacono et al., (2009) confirm that context is valuable, relevant data in case study research.

Systems thinking, a synthesis approach, is applied to conceptualise complex relationships and detect patterns related to cross-sector partnerships for environmental impact. This study is framed by systems thinking, an inductive logic which entails understanding complex phenomenon from a range of perspectives and accepting contextual details as relevant data. In a systems approach to knowledge production, quality control is driven to satisfy the demands of key stakeholders within context (Jackson, 2009). This is compatible with a system view that aims to understand dynamic relationships over time from the perspective of diverse stakeholders.

Impact is important to this research as it aims to increase uptake of CSPs for urban ecology across New Zealand. According to Eisenhardt and Graebner (2005), "papers that build theory from cases are often regarded as the most interesting research and are among the most highly cited pieces in *Academy of Management Journal*, with impact disproportionate to their numbers" (p. 25). Following Yin (2015) case study research protocol, the case studies were analysed collectively to uncover commonalities across all cases.

Method

This research is a cross-case analysis of six cases: all CSPs for urban ecology impact. Each individual case study is based on an interpretivist approach in which subjective thought and ideas are valid (Greener, 2008). In 2020, CSPs for urban ecology are a relatively new social phenomena; CSPs are dynamic relationships that occur over space and time, which made them difficult to study. Case studies are considered most useful in the early phases of a new management theory, when key variables and their relationships are being explored (Yin, 1994; Eisenhardt, 1989). To ensure credibility of the data, analysis and findings, I had no knowledge of these cases prior to this study. The interviews were conducted by another researcher except for one key informant interview.

When selecting cases to include, careful consideration was given to maximise diversity. Cross-case analysis allows for comparisons that show whether an emergent finding is idiosyncratic or more generalisable (Eisenhardt & Graebner, 2007). A broader and

more scalable solution increases the potential for uptake, therefore achieving greater impact in relation to the size of the problem.

The specific methods and procedures used in this study are described in this section. This includes sample selection, interview methods, and data analysis.

Sample selection

The geographical boundary for this study is New Zealand. Over 87% of New Zealanders live in cities (Clark & Kirby, 2016). New Zealand is an interesting context for this research as ecological restoration is being applied to urban ecosystems. The criteria for case selection were as follows:

1. Must be New Zealand-based;
2. Cross-sector partnership including business and at least one other sector (government or non-profit);
3. The goal of the partnership relates to urban ecology impacts or outcomes;
4. A heterogeneous geographical distribution across the country;
5. A variety of scale with a city focus but also including local, regional, and national.

Research into possible case studies was conducted on the internet and through conversations with those in the New Zealand sustainability and urban ecology community. A list of possible case studies was compiled, and ultimately there were six CSPs identified as meeting the criteria. There were two types of interviewees: case study participants and key informants (see Table 2 below). Case study participants were directly involved in one of the six case studies to the practitioner perspective and maintain a strategic focus. Key informants are subject matter experts who have experience across multiple cross-sector partnerships generally, rather than urban ecology specifically. The result was a total of 30 interviews between May 2018 and August 2019. Participants were from a wide variety of backgrounds, sectors and experience to maximise diversity (Rowley, 2012). For further details about the cases, a summary of each case study can be found in Appendix 1. Each organisation was contacted via email with the list of questions (see Appendix 2) and participant information and disclosures (see Appendix 3).

Table 2: Interviewees by case, scale, role and sector

#	Case or key informant	Scale	Role	Sector
1	Hammond Bush	Local	Former chair of community group	Community
2			Director, Community and services	Government
3			Team leader, Parks and recreation	Government
4			Principal Ecologist	Private
5			Volunteer, Project Echo	Community
6	Biodiversity Hawkes Bay	Regional	Biodiversity Sponsorship Manager	Community
7			Manager of City Development and Policy Planner	Government
8			Business owner	Private
9			Executive Dean	Academia
10			Chair of programme	Community
11			Land Services Manager	Government
12			CEO of airport	Private
13	Zealandia	City	Director, Centre for People and Nature	Semi-Private
14			CEO of Zealandia	Semi-Private
15			Chief Marketing Officer	Private
16			Environment Partnerships Leader	Government
17	Tauranga Moana Biosecurity	Regional	Administrator	Community
18			Communications Advisor	Community
19			Cargo Services Manager	Private
20			CEO and founder Resource Developer and Operations Manager	Community
21			Head of Communications and External Relations coordinator	Pan-industry
22		National	Sustainability Manager	Private

23	Vector Urban Forest		Senior Biodiversity Adviser	Government
24			Head of Strategic Partnerships	Government
25			Co-founder, Sustainable Coastlines	Community
26	Community Guardians	City	Executive General Manager, Strategy and Marketing	Private
27			Project Manager	Community
28	Key informants	National	Executive Director, Sustainable Business Council	Private
29		National	Environment Partnerships Leader	Private
30		National	Principal Partnerships Advisor	Government

Interview methods

Interviews were semi-structured to focus on the main research questions, whilst allowing flexibility to extrapolate on the context (Greener, 2008). Interviewees were asked about their CSP strategies, goals, success, evaluation, and what impact they have achieved. Being pragmatic, interviews were short and focused, lasting approximately 30-60 minutes (Rowley, 2012). Both key informants and case study participants were asked the same questions.

After confirming the subject's willingness to participate, the interviews were conducted in person. If logistics prevented an in-person interview, the interview was conducted by phone or video conference. The interview was run like a conversation, starting with a clear overview of the research. With the subject's permission, the interviews were audio recorded, then transcribed. The files were stored in a password protected computer for security and confidentiality. Careful consideration was given to ensure that the interviewees understood the questions. According to best practice interview methods, no academic jargon was used, questions were open-ended, and only one question was asked at a time (Rowley, 2012).

Data analysis

With hundreds of pages of data, analysis was an iterative process to uncover high-level themes. To establish credibility, interview data, documentation, and archival records were used to minimise errors and bias (Yin, 2017). The subjective nature of the data and phenomenon made this quite challenging. To increase reliability of the findings, a well-organised database of all evidence for the case study was maintained and accessible. Due to the number of cases, data was triaged, and the most relevant documents and archives were given priority in examination. Participants had the right to review what was written before it was made public and provided permission to use their roles and organisations. Data analysis included five steps: compile, disassemble, reassemble, interpret and conclude (Yin, 2017).

For the compile and dissemble stage, a clear chain of evidence was maintained including a master spreadsheet with details of the interview participants such as name, role, and organisation, as well as time and location of interview. The data set was organised by case, geographical location, scale, and case or key informant, it was explored by the main themes of the research questions, annotated, and coded. After exploring the data by theme, each transcript was read thoroughly, and additional annotations were made. To mitigate my own bias, I reflected on my assumptions throughout the process and checked coding with my supervisor. The themes were then finalised based on the research questions and anything pertinent that emerged in the coding. These themes became the basis of the narrative for the research findings.

For the compiling stage, all 30 interview transcripts were loaded into an analysis software called NVivo. Each transcript was loaded as a separate file and named after the interviewee. All transcripts were analysed collectively as the goal of this study is to find commonalities across all partnerships and sectors. Once loaded into nVivo, the data was disassembled by coding according to the research questions. The data was ready for a rigorous thematic analysis to uncover the latest insights across all CSPs for urban ecology, regardless of sector, scale, or issue.

To begin the data reassembly, I did a text search for key words such as “effective”, “success”, “impact”, “benefit”, and coded the data into appropriate themes. After

exhausting those keywords, a list of themes emerged. See Appendix 4 for a list of the Level 1 and 2 codes generated, the main themes are highlighted in pink with the sub-themes listed below. To stay focused on the research questions, I prioritised data from the themes called “How to be effective” and “Impact and benefits to organisation and community”.

Below, Figure 2 is a word cloud of the most frequent words used in the transcripts. It was interesting to note that the two most used words are “relationship” and “people”. I ended up with two datasets: 1) How to measure success to be effective in CSPs for urban ecology 2) What impact are the CSPs achieving? For the second order of thematic analysis, each dataset was organised by a relevant CSP theory.

Figure 2: Word cloud of the most frequently used words across all 30 transcripts

How to collaborate effectively across sectors

First, how do CSPs achieve positive impacts for urban ecology? To determine how CSPs achieve positive impacts, one needs to understand the strategy behind effective collaboration and the greatest barriers and opportunities. In order to assess effectiveness, there needs to be a form of measurement and evaluation. Measuring success is a gap in the CSP literature, which this study aims to examine. Therefore, questions about measuring success and impacts achieved were incorporated into the

interview questions. Data was collected about how CSPs and key informants measure the success of the partnership and what impact has been achieved.

To frame the question about what skillsets are most effective for CSPs, I applied the four skillsets for effective cross-sector collaboration proposed by MacDonald & Stadtler (2017) to analyse the transcripts to determine which were most essential to success. The four skillsets for effective collaboration are interpersonal, communication, entrepreneurial, and systems thinking.

Assessing impact of CSPs

Impacts were coded into based on the partnership monitoring and evaluation framework depicted in Figure 1 (above). The insights were supported by quotes, strategic documents, annual reports, and media reports. Triangulation was used for construct validity, which involved using my database of evidence to get a deep understanding of the data (Welch & Piekkari, 2017). The data was reviewed and refined over four phases of thematic analysis, saving each iteration along the way.

Limitations

Qualitative case study research is associated with limitations related to rigor, generalisability, and credibility. The drawback of case study research is the research results are less generalisable because the research design is limited to narrow perspective of the phenomena. Generalisability was increased by conducting a cross-case analysis. Transferability, which is the ability to apply the case study's findings to other situations, is what makes the research valuable (Yin, 2017).

To bolster external validity, I made sure to: (1) clearly identify the situations in which the learnings are applicable; (2) generalizable findings are the "lessons learned" of the research process. Although data analysis is an iterative process throughout data collection, it is important to start with a strong theoretical basis to lay the foundation for quality findings. The data collected should either corroborate, modify, advance, or reject a theoretical concept, or propose new concepts (Yin, 2015, pp. 40-41). In multiple case studies, replication logic will strengthen external validity.

Other constraints for this study were time and resources, which impacted the size and scope of the research.

Research Context

Most research is conducted in the northern hemisphere, whereas this study showcases the latest CSP practices in the southern hemisphere, specifically the Asia-Pacific region. This study was conducted in New Zealand, which is often looked to as a role model for other parts of the world. In fact, in 2019, the FutureBrand Country Index ranked New Zealand as 11th best reputation in the world (Newshub, 2019). New Zealand has a reputation for being "clean and green" due to the way it markets itself internationally (PA Consultants, 2001). With the dairy and tourism sector as NZ's biggest exports, research shows that $771 million - $1.5 billion could be at stake if the environment is perceived as being degraded. The findings show that "if New Zealand were to lose its clean green image, it would have an enormous effect on the New Zealand economy" (PA Consultants, 2001, p. 5). The New Zealand government is aware of the reputational risk of ecological degradation; therefore, it is more likely to be a more progressive context to study of CSP for urban ecology. For context, the covid-19 global pandemic emerged during the concluding phase of this study. Now more than ever, cross-sector collaboration is needed to tackle complex societal problems.

Biodiversity in New Zealand is unlike anywhere else in the world due to its geographical isolation, which means it is extremely valuable and critical to protect. For approximately 60 million years, the islands of New Zealand have evolved in isolation in the South Pacific ocean. (Clarkson & Kirby, 2016, p. 180). According to the government's report on the state of the environment, "the biodiversity of Aotearoa New Zealand is essential to our culture, identity, and well-being. The whole variety of native plants, animals, microorganisms, and the ecosystems they create, is unique to New Zealand and irreplaceable" (Ministry for the Environment, 2019). However, the report highlights that New Zealand's natural resources in decline (see Table 3 below).

Table 3: A list of the New Zealand species currently at risk or threatened with extinction, adapted from New Zealand's report on the state of the environment, called Environment Aotearoa (2019)

Species	Percentage currently threatened with or at risk of extinction
Seabirds	90
Freshwater fish	76
Reptiles	84
Vascular plants	46

Since people arrived roughly 800 years ago, New Zealand's natural capital has been deteriorating with 75 animal and plant species already extinct. Currently, no city in NZ meets the minimum 10% threshold to protect indigenous biodiversity from further decline (Clarkson & Kirby, 2016). One of New Zealand's primary ecological threats are invasive species. There are 2,264 introduced species which predate or out-compete native species (Clarkson & Kirby, 2016). Approximately 31 introduced mammals wreak havoc on the indigenous biodiversity, preying on the nests of ground-dwelling birds and eating native lizards and invertebrates (Clarkson & Kirby, 2016). At the same time, urban sprawl has consumed native ecosystems, stripping the land of its native flora and fauna and causing fragmentation. In fact, since human settlement, 41% of native bird species have gone extinct (Lyver et al., 2016).

New Zealand's natural resources are of cultural significance and necessary for the wellbeing of people. There is a strong link between ecological restoration and community resilience. A study found that from interviews with community leaders, ecologists, and the indigenous people of New Zealand known as Maōri, most people were positive about the idea of restoration and expressed grief about the state of degradation (Lyver et al., 2016). Interviewees acknowledged several benefits from restoration of coastal forests including harvesting food and medicine, and opportunities for recreation, employment and tourism (Lyver et al., 2016). Restoration provides an opportunity for community members to contribute to the common good

and inspire them to participate in similar activities in the future (Lyver et al., 2016). People who participate in restoration activities form bonds and a greater appreciation for the biodiversity they are helping to restore.

Demonstrating the nation's ripeness for this study, the New Zealand government published an interim report in November 2019 with a proposal on how to transition to a sustainable economy. It is called an interim report because it is currently under public consultation until February 2020 for further refinement. The Sustainable Finance Forum (SFF) is a CSP in pursuit of sustainable prosperity for New Zealand; its focus is to achieve sustainable prosperity by reversing the decline of natural resources. The SFF released an interim report (2019) describing the principles and characteristics of a sustainable economy drawing on the Māori worldview. The Māori world view is based on a system-level view on the relationship between society and the environment. It is encouraging to see the SFF applying a systems-level worldview to design a sustainable finance system.

The 2019 Sustainable Finance Forum (SFF) report highlights opportunities and barriers to the transition. The report identifies that now is the opportunity to partner for long-term shared value and collective impact. A plethora of barriers and system issues in the current New Zealand economy are identified including a capital misallocation due to market short-termism, limiting decision-making to financial outcomes only, asset mispricing, and lack of awareness and data. The proposed solution is to shift away from "unsustainable" products and services, and towards sustainable products, services and business practices. More research needs to be conducted into how to form a partnership between relevant stakeholders to scale up the impact (Endreny et al., 2017). In New Zealand, the government needs to provide incentives for restoration practitioners, nurseries, landowners, iwi, business, and local communities to contribute to restoration projects and conserve the country's unique biodiversity (Norton et al., 2018). As Endreny et al. (2017)'s research demonstrates, when collaboration is scaled up, outcomes will also be scaled up.

Ethics

Waikato Management School ethical approval was given for this research.

Chapter 4. Findings

How do CSPs achieve positive impacts for urban ecology?

The aim of this research is to investigate existing CSPs to better understand how they scale up impact for urban ecology. The sub-questions are: *How can different sectors collaborate effectively?; What are the frequently identified barriers to effective collaboration?; How do CSPs measure success?; What impacts are being achieved for urban ecology?; and What is different or unique to urban ecology partnerships?*

CSPs achieve positive impacts for urban ecology by creating a network dedicated to solving the grand challenge by capitalizing on collaboration. The data reinforced the importance of CSPs to tackle complex problems by education, advocacy and raising awareness, Some of the urban ecology issues being addressed by the CSPs in this cross-case comparison include biosecurity (pest control and emergency management), biodiversity enhancement (ecological restoration, weed control, species conservation) and improving the wellbeing of people and nature. From the perspective of a chief executive of an organisation that aims to transform society by improving the interactions between people and nature, partnerships are "not just a nice to have. It's absolutely fundamental in the space that we occupy, to have partnerships." The emerging partnership approach is compared to business-as-usual (BAU) by a public sector partnerships manager in the quote below:

> Some of the leading stuff I see in the partnership space is a business going, "Hey, I want to achieve this outcome, and I think it's really cool", and instead of going, "but I'm not going to work with an NGO because they're bad and they challenge me and I don't want to be challenged", the BAU response would be, "Great, you know what? This NGO works in this space and there's a government work program in this space. Let's get together and chat."

Participants described their approach to partnerships as relationship-based and opportunistic. As evidence of this claim, the most frequently used words in all transcripts were people, relationships, organisations, community, and trust. It is well-known in the literature that trust and strong relationships are key to success (e.g. Dentoni et al., 2018, Grudinschi, 2015; Laasonen, 2017; Zollo, 2017). What is less known is how trust translates into CSP success. The following sections will examine

how CSPs strategise for urban ecology impacts, including common barriers, best practices, and measuring success and impact. Ultimately, the goal is to identify a practical, scalable strategy to increase CSP uptake and impact.

What are the frequently identified barriers to cross-sector partnerships?

The three most frequently identified barriers to CSPs are complexity and time, resourcing constraints and finding the right partner. The predominant barrier to CSPs is the inherent complexity of urban ecology issues and cross-sector collaboration, coupled with the long-term commitment required for ecological timeframes. The second and third barriers most frequently identified, resourcing constraints and finding the right partner, had approximately equal weighting in terms of number of references and number of transcripts which related to the theme (see Table 4 below).

Table 4: Summary of themes related to the top three barriers to CSPs are complexity and time, resourcing constraints, and finding the right partner.

Themes related to barriers	**References**	**Number of transcripts contributing data to the theme**
Complexity & time (effort, long term commitment, turnover)	64	21
Resourcing constraints (time, money, skills, expertise, labour)	56	22
Finding the right partner (tension, misalignment, misunderstanding partnerships)	54	20
Total	297	29

Complexity & time

Time is a barrier due to the long-term commitment and effort required for partnerships, especially CSPs for urban ecology. It takes years of engaging to build trust, which is the foundation for a strong relationship. An executive director within the private sector observed that collaboration takes time to invest into relationship building and trust, however “that's not productive time in a business person's mind”.

Time is a difficult barrier to overcome because “if you're working together on common purpose on something that's slow, and you're constantly being asked to do your day job, that creates a real difficult dilemma.”

By definition, a CSP is a long-term project, which could feel difficult and risky, particularly for businesses. A relationship manager in the public sector explained, the CSP goal requires such a “huge system shift”, that the partnership “would have to be in place for years and years…and that’s really hard to keep resourcing and enthusiasm.” When it takes a long time to see significant impact, “people then lose heart and they get sceptical about working with people.”

> Try and do whatever you can to work with each other on a personal level and build trust with each other because it will be your personal connection that will hold the partnership through…Put the right time aside. You need time to get to the deliverables in the partnership, but you need time to build trust in the relationship. Those are the things I see are under-resourced in any partnership.

Resourcing constraints

The amount of effort and expertise required for partnerships is a significant barrier. From the perspective of a former community group leader, partnerships require “enormous energy” from all sides to make it work and a lot of organisations struggle to justify the commitment along with their existing financial and time commitments. “They're just busy and trying to make money. Business owners are usually really busy people and just trying to cover their own commitments. That was my impression. It wasn't that they had a problem with anything we're doing. They were just flat out and committed financially and timewise.”

A lack of ecological expertise is a barrier for CSPs for urban ecology. A not-for-profit participant said they see a lot of people who want to enhance their local biodiversity, but they lack the ecological expertise:

> I see is lots and lots of people going, ‘I really need to do a makeover in my gully. It's the most important thing for me to do.’ And they will then embark on a journey where they'll go, ‘Well, it's easy enough to plant plants.’ And then after a couple of years they realize that actually it's not that easy, and they didn't do their site preparation…[or] their pest control at all. There's a huge amount of reinventing wheels going on.

Finding the right partner

An unexpected finding was that having the right people involved is both a barrier and critical to success. A partnerships advisor from the public sector said, “personalities play a far greater role than I have ever imagined” and the best intentions “won’t get you through the tough times unless you have people who can and want to work together.” There is an inherent tension when collaborating across sectors, as described by a public sector partnerships manager, “all partnerships go through a cycle of really tough times once you start getting into the nitty gritty and having to lever things and work together in a way you might not have worked together before.” Because partnerships are typically values-driven, turnover can be detrimental to a partnership success.

In one case, the leader of a local ecological restoration group agreed that the partnership model can be successful, however they found partnerships were not always long-lasting, especially with businesses. The community group’s experience demonstrated that poor communication between partners led to unfulfilled goals and satisfaction. There was also a mismatch of expectations, where the business partners may have high expectations for the community group, which is made up of local volunteers. The community group leader felt if they were unable to meet the businesses’ standards, they would be “letting them down” or would have to take on additional responsibility and stress to maintain a high level of volunteer engagement. The chair of a community organisation from another CSP for ecological impact says that in principle, businesses “don’t actually care about the environment at all. They care about one thing, bottom line. We need to show them how it’s in their economic interest to participate in this.”

How can different sectors collaborate effectively to scale up impact?

The results of thematic analysis found the themes related to CSP success are connectors; diversity of culture and expertise; monitoring, measurement and evaluation; and partnership skills. The data below summarises how the interviewee

data was analysed, and the number of transcripts and references were considered for each theme. Overall, each of the 30 transcripts contributed to the data analysis seeking the key to effective CSPs. Of 415 references, almost half referred to partnership skills as the key to success, which are defined as interpersonal, communication, entrepreneurial and systems thinking (MacDonald & Stadtler, 2017). Further analysis was conducted to determine which of the partnership skills is most critical to success, and found that interpersonal skills are invaluable. This will be explored in the section below about connectors. The “connectors” theme was an unexpected finding that is new to CSP theory.

Diversity of culture and expertise were highly mentioned as key factors in CSP effectiveness, although this is well-understood in CSP literature. CSPs benefit from combining levers across a system to scale up impact. Diverse perspectives contribute to a richer, broader strategy and resource pool that is scalable based on partner participation. A land manager for the government described how working a cross-sectoral way creates the potential for system change below:

> By nature of having different partners across different threads of the process, you actually see across a system and you can implement the system as opposed to just part of the system. That would be a critical part of partnerships which I think is really valuable, really interesting and it's also a lot of fun because you can actually have genuine impact, and with partnerships generally the impacts a lot wider, than just with yourself.

System change is the highest level of impact and can only be achieved after sufficient investment of time and trust into the relationships. A key informant who is a partnerships advisor within the public sector says cross-sector collaboration is needed to deliver outcomes and achieve the desired longevity and impact. The director of a semi-private organisation that aims to deliver mutual benefits for people and nature emphasised that there are ways to contribute to ecological outcomes other than money, such as corporate volunteering or providing business services to projects such as accountants for lawyers, to help the CSP further its goals through their daily work.

Table 5: Summary of top themes related to how to collaborate effectively across sectors

Themes	Number of transcripts analysed	References
How to be effective	30	415
Relationships and communication	30	193
Monitoring, measurement and evaluation	29	86
Diversity of culture and expertise	25	94
Connectors	17	42

Creating synergistic relationships for scalability

When asked about the most important factor in successful partnerships, the participants said success comes down to having the right people involved, trust and relationships (see Table 5 above). Throughout the 30 interviews, trust was identified as the most critical component for success 15 times. The respondents explained that a high-trust relationship holds the partnership together and gives people confidence in the project. Enduring relationships need social contact to maintain trust in the long term. A partnerships manager within the public sector attributes the CSP success to all partners being on the same page, saying "we trust each other, we can see opportunity here. We know we could keep on doing what we're doing, but we know that there's more value that can be generated here."

A community participant stated the partnership is, “about trying to maximise our effectiveness, so we approach it with the mindset of…making sure that whenever we partner with someone we're not passing off the responsibilities, but rather we're trying to increase the productivity or the possibilities.” It shows relationship-based approach was described by a partner from the private sector who attributed the success of their partnerships to, “really acknowledging the other parties…not asking for anything from a partner that will be uncomfortable if that partner asked us for the same thing.” In a partnership aimed at improving local ecological outcomes, a private sector consultant says that partners look to each other for mutual affirmation and acknowledgement.

A common approach to building trust amongst the CSP participants was to have a shared vision and common values. A community participant explains, “shared interest is the way to start a partnership. We want a common vision, which creates an identity. If a healthy biodiversity is part of the Hawke’s Bay identity, then we are all winners out of that.” The CSP creates an opportunity to “grow it and also give something back” that otherwise would be challenging to organise. Another private sector interviewee says what makes it rewarding and scalable is that “everyone was willing, because…this isn’t extra work, it’s not over and above the things we’re already doing, it’s heightening…the things we’re already doing”.

What is less known, is an approach that emerged from the data, used to counter the frequently cited barrier of time/commitment, that is to frame the CSP as inspirational. The inspiration is being part of a collective voice, but inspiration is also about winning hearts and minds in the framing of the purpose. The quote below exemplifies the approach.

> We have some pretty big challenges ahead that require us to be part of a changing society. Increasingly, it is incumbent on all of us, to reflect once in a while, what contribution and value will I add, irrespective of what I am as an organisation. I might not be in conservation, but if it really matters, then how do I play my part in this? We will only achieve this through partnerships, there is no way we will achieve this by doing it on our own.

When a CSP is formed to achieve an inspirational vision, the individuals and affiliated organisations become connected into a network that is tackling the issue over space and time. As one business interviewee said, “everybody has got the same drivers, it's just they're pulling in different directions, and so as long as you've got people that are willing to be working in that space, then that's the key.” The director of an organisation within the private sector said “we've made some deliberate decisions to partner and we call it collaborate in cross-sectoral ways because we think that's a really important part of the system's changes that we need to make on issues like climate change or future of work.” The CSP network increases education, advocacy, and raising awareness about the issue, which means effective and regular communication helps to maintain engagement.

The example below shows how the aspirational mission to grow the local conservation community was well-received. When a CSP takes a stand for a complex, long-term issue,

the community generally wants to support the initiative. The CSP provides a forum and network to make a difference, even if the aspirational vision cannot be achieved for 500 years.

> A key mission was to grow the conservation community in Hawke's Bay, winning hearts and minds. And to do that you have to engage with people, you have to show them what's possible, you have to show them that problems can be fixed and show that they can help, they can play a role. And the good news is, that by and large, the public are right behind it. Most people want to do the right thing, most people like nature, they don't want to see landscapes ruined, or dirty rivers.

Once it is functioning as a network, the CSP has the potential to scale activities at any time by amplifying each other's initiatives and tapping into their collective power. Many of the interviewees talked about the power of CSPs to scale up impacts. In one example, the executive director said "if you've got a single voice, it's good, but multiple voices saying the same thing is even more important." The CSP creates a forum where natural competitors can build trust and work together for the common good, which is a more synergistic relationship. One of the unexpected benefits that is not always recognised was described by the executive director as follows:

> if you have spent the time building trust and you're doing it in a cross-sectoral way with people who would often be your critics, it's really helpful to have those relationships where you've got enough trust in relationship where you know you're going to disagree but actually you can be using each other to help each other be more effective.

In order to achieve system change, there is a lot of coordination required to orient diverse stakeholders toward the goal. A successful CSP has a clear strategy, which managers can incorporate into operations, communications and governance. Communication behaves as the feedback loop in the system, keeping partners informed, engaged and connected. According to a government policy planner involved in a CSP with a 500-year regional biodiversity strategy, good communication helps to "establish common ground" and clarify roles, responsibilities and goals of the partnership. Open communication is critical to establish expectations and commitment, and ultimately finding the right partner or project to support. Once the partnership is set up, ongoing communication is important to maintain engagement and momentum. The CSP participants are living the partnerships values in their daily

lives, which multiples the impact and influence. As described by one business participant “they’re not just trying to achieve the outcome as a deliverable for the project. It’s actually forming part of their day to day job as well, and that’s where you get that big bang for your buck”.

Connectors

When asked about the greatest factor in scaling up CSP impact, some of the interviewees credited CSP success to an individual who held the partnership together and pushed it forward. Participants described a specific type of person called a “connector.” Based on the data, a connector is exceptionally good at relationship building and networking. Characteristics of a connector include productive, values-driven and social. Because the connector is driven by values, they are genuinely committed to the cause and role model the values in their daily life.

A good example of this type of person is a community member from one of the CSPs which promotes regional biodiversity. A private sector CSP participant states that partnership success “comes down to connectors like Sam” referring to a fellow partner as “a very powerful connector” in the region. The connector is described as follows, “he's a very good example of someone who gets shit done. He has uncanny ability to hook people up and create partnerships.”

Sam is a passionate people person, he is someone who can build long-lasting relationships. His talent is talking to people in a way they understand, getting them excited, making sure they understand the responsibility they have as a business or organisation, and helping them find the opportunity to grow. As part of this study, Sam sees his role is “to take a client to the top of the mountain and show them the view.” He describes his approach to CSPs as follows “it's having those marketing skills, networking skills, good at relationship, good at telling a story, the passion, and ideas.

One influential person can connect and mobilise large groups of people, and that is the value of the connector. The connector in the credited with bringing the airport into their regional biodiversity strategy. The chair of the Hawkes Bay Biodiversity programme describes Sam as “a very active guy for us and has engaged with a number of big businesses” with the airport being the biggest one so far. The airport is

described as the “front door to the region”. They have fostered a positive relationship with the airport, saying “They've been wonderful to work with, they're dead keen and will be critical in getting our message out.” In return the CEO of the airport says “what partnering allows us to do is to build relevance or influence into audiences we might not otherwise be able to reach.”

The airport is motivated to contribute to positive sustainability outcomes for the region as the aviation industry is under scrutiny for its negative sustainability rating. The airport sees its’ role as connecting people and businesses in the region. Many of the airport’s employees live in the community. The airport does not want to harm the local biodiversity, which made the CSP an effective way to align public, private and community activities for urban ecology values.

Another example of a connector is a CSP participant from the academic sector, who is able to build relationships with very diverse people, even when working with difficult personalities. To maintain anonymity, the pseudonym for this connector will be Susie. In the course of their CSP work, Susie recalled a partner that was so difficult and unpleasant, most people did not want to invest any time in the relationship. Instead of avoiding the difficult person, the interviewee was patient and listened to the person “rant”. Then afterwards, Susie would provide the necessary information to keep that partner engaged. In return, the abrasive person became an ally with access to large networks. Someone with the interpersonal skills to keep difficult partners engaged has the potential to influence a broader audience. Susie described her approach to partnering as being “personable” and building a network of people who fit with their principles.

How do CSPs measure and evaluate success?

Monitoring, measurement and evaluation is a known gap in the CSP corpus, therefore further analysis was conducted to elucidate how the CSPs measure and evaluate success. When asked how success is measured, participants consistently confirmed that monitoring and evaluation needs improvement. Several participants reported that the CSP performance is unclear, with reporting absent or poorly utilised. A manager from a community non-profit said, “to be honest, there's not a lot of work done on

that, knowing how successful we are" Several of the participants expressed a desire to improve reporting regimes, which would help them communicate CSP impact. A key informant from the private sector acknowledged that evaluation is important to socialise CSP projects and show value to decision-makers.

The most common ways CSPs measured success was with feedback, referrals, engagement, surveys, and hard data on the projects completed. Quantitative measures included statistical data, such as KPIs from a business plan, social media engagement, event attendees, or volunteer hours of labour. For example, a consultant within the private sector tracked success through social media, stating, "how many likes we get and the reach we have there, is an indication of some sort of reach and success". Even if you can track the success of the project through engagement, it can be hard to know if the CSP is affecting real system change. One business participant explains the challenges related to measuring success for a CSP for biosecurity excellence. Because partnerships evolve over time:

> when it comes to a metric or an end goal, that's not always entirely clear right at the very start. And often it does become clearer as you go. Especially if it's a partnership that involves a lot of comms and a lot of the work that I do, because comms is so hard to measure, and if you try and measure it you start doing things that are not worthwhile.

CSP success is not straightforward, particularly when the goal is focused on ecological resilience. Another way of looking at success in the CSP for biosecurity is how prepared they are for a biosecurity incursion. One community participant said "we don't have clear metrics for success, but what we do have is a kind of protocol for the whole group" in the event of a biosecurity incursion. It is difficult to put a quantitative value to a goal like ecological resilience or emergency preparedness, yet the value is clear. If there was a biosecurity incursion, there is a clear protocol for management. Overall, this increases the region's resilience to the threat. They monitor they performance annually with a survey to their audience about the information they receive and biosecurity awareness, which informs the CSP work programme. The CSP for biosecurity may not have typical metrics for success, however, they highly value feedback from their audience.

One way to communicate the dynamic achievements of CSPs is telling the story of the partnership, which is the narrative of what the partnership is doing. The narrative is useful to keep all partners on the same page and justify the investment to funders. As one not-for-profit participant explains, “it is really important to us…to be able to explain the benefits of that community investment… we need to be conscious of that and wise about where we spend it, invest it.” One business participant said they are “thinking about how…[to] better tell our story around the role of nature in an urban environment and how people can connect with that.”

One of the case studies, Zealandia, is an exemplar for innovative reporting which integrates ecological, social and economic data. The CSP is based on enhancing a 225-hectare eco-sanctuary in Wellington, New Zealand, the nation’s capitol city. Zealandia reports its progress against the four capitals: social, environmental, human and financial (Zealandia, 2019). The integrated reporting approach is described as a narrative, “a concise, communication about how an organisation’s strategy, governance, performance and prospects, in the context of its external environment, lead to the creation of value in the short-medium and long term. At the same time, they have been developing an evidence base for their work enhancing connections between people and nature and “improving over time” says the director of the Centre for People and Nature.

Overall, there was a focus on metrics for engagement. Many of the engagement metrics include social media followers, likes, and shares, which indicate “reach and success” says a private sector consultant. The most common ways CSPs to measure success was with feedback, referrals, engagement, surveys, and hard data on the projects completed. A few of the interviewees talked about using regular relationship meetings as an informal measure of success to reflect, monitor, adapt, improve and evolve. Quantitative measures included statistical data, such as KPIs from a business plan, social media engagement, event attendees, or volunteer hours of labour. Another way to measure engagement is the success of events. For example, one of the case studies is a project that aims to improve data and protection for local bats. The government said the bay tours are regularly sold out, which is an indication of

successful. However, they added, “it's always really hard to know whether you've been effective in achieving change.”

What impacts are being achieved for urban ecology?

Table 6: Four orders of impact loops (van Tulder, 2016) were applied to the data, resulting in the three top themes

Impact & benefits to organisation and community	Transcripts contributing to theme	Number of references
Benefits to organisation and community	30	220
Scaled up impact and achievement	28	126
System change	9	30

Mutual benefits for planet, people and profit

Each of the CSPs had an element of mutual benefit for the planet, people and profit. The main themes were benefits to the organisation and community, scaled up impact and achievement, and system change (see Table 6 above). The CSPs in this case study are all focused on urban ecology issues, including reducing emissions, improving biosecurity, weed and pest control, scaling up community conservation, creating a long-term restoration plan, protecting local species, monitoring and data collection, and raising awareness and education about biodiversity.

In all of the six case studies, the local community plays an important role in scaling up impact. One CSP organises “bat fun days” which serves to educate the community about the biodiversity in their own backyard by providing tours about the local bat species. One of the community volunteers says that the community events are almost always booked out, and “people get really inspired and interested. A lot of people love bats, and…that’s their hook into environmental protection.” The ecological outcomes achieved by CSPs will be mutually beneficial for the local community and nature.

CSPs for urban ecology creates an opportunity for people to connect with nature, which mutually benefits people and nature for generations to come. One of the CSPs was founded by a power company that had to cut down trees, which interfered with

power poles. The partnership began with a clear overarching outcome, to tackle the issue of tree inequality, which the CSP defines as increasing "awareness about the trees being planted in the wrong place" says one of the partners, a private sector manager with ecological expertise. The first part of the strategy was that for every tree cut down, the business planted two more. The second part of the strategy was to increase education and awareness about planting the right trees in the right place. In addition to tackling tree inequality, there were many additional benefits associated with the CSP activities, such as "getting our staff out, being connected with our suppliers, actually making environmental improvements."

When asked about the impacts achieved by CSPs, the greatest impact of urban ecology CSPs are achieved over time. A key informant, executive director of a membership organisation recalls a cross-sector collaboration between regional council, scientists, city and national government, and several community groups. The city of Hamilton was once known as a "green desert"; there was no habitat or food sources for local fauna as it had been long replaced by farmland. In 2007, the Hamilton Halo project was established to bring native birds such as tui and bellbirds back into the city. To protect native birds, the strategy was to removing pests that predate the birds and plant certain native species that provide year-round food for the tui and bellbirds in the city (Waikato Regional Council, n.d.). The term halo describes a 20km radius around the city, which is the based on how far a tui flies for food. The key informant describes the change in the city as follows:

> we often call the birds the ambassadors for biodiversity because it's the thing that people can relate to. There's something really heart-warming and joyful about hearing [a tui]...But I wouldn't hear it here in Hamilton. And when we started to hear tui, it was like Ah, this is amazing.

One major benefit that CSPs provide to organisations and wider society is it creates a platform to harness society's energy toward improving ecological outcomes as encouraged by Hajer et al. (2015). The issue of biosecurity is being tackled by a CSP, one of the case studies, called Tauranga Moana Biosecurity Capital (TMBC). TMBC is a network of organisations that are committed to making sure that the kiwifruit industry is ready for a biosecurity response by "protecting our region, keeping bad bugs and devasting foreign plant and animal diseases out of our region…through community

collaboration" (TMBI website, 2020, http://www.tmbiosecurity.co.nz/). With partners from government, indigenous people, businesses, scientists and educators, CSP participants consider themselves "kaitiaki", an indigenous word meaning guardians of their region. The programme director explains "it's about a pretty powerful group standing shoulder to shoulder and saying it's absolutely essential we pool our expertise and resources for the sake of the environment, our taonga, our economy" (watch TMBC launch https://www.youtube.com/watch?v=2REIj9Qe5ss). The strategy to improve biosecurity resilience is to partner with everyone, says a partner from the community.

> We've been really upfront, since the organisation was created, that we are pan-industry, so we work across the industry. We get on with everyone. We challenge people when we have to, absolutely, and sometimes we do have to challenge people, but we never stop working with them, because that's the only way that we can ensure success.

The head of communications from Tauranga Moana Biosecurity CSP emphasises the importance of community support for several reasons. To achieve better outcomes for the local biodiversity, the community need to be involved as they have the expertise and the long-term interest. Through the CSP the kiwifruit industry displays a sense of accountability to the community by working proactively to protect their way of life and resilience for both the community and industry.

> We're really aware that you need community support…it's the right thing to do… to give back to community…we're helping to train young people which is good for our industry, but also helps us build support in the community. We are very thankful, we need the support of the communities to…continue to grow and learn off that.

In the example below, the CSP runs a programme to train young people in the kiwifruit industry, providing a new skillset and job experience. Working for the kiwifruit industry means protecting the local biodiversity and economic assets. It benefits the kiwifruit industry as follows, "we want to attract some of New Zealand's best and brightest so that's the focus there." It is a synergistic relationship in that the planet, people and profit win.

An administrator for a community group says there are no set expectations for the members, rather the value of the network is to create a platform for organisations to

join up and achieve their own goals with the help of others with the same passion for biosecurity and alignment of values. To stay ahead of the biosecurity threat, The CSP is a central hub for the latest information about biosecurity in the region, proactively connecting and communicating the partners about the latest news in biosecurity.

As the CSP gains legitimacy and influence, the potential impact and achievement becomes scalable as the CSP gains momentum and grows. “We have such good relationships that we can bring other partners in, so we can help heighten what other people might be doing” says a TMBC manager. The benefit to the community and wider society is that TMBC is creating a network to improve biosecurity in the region, which did not previously exist. The CSP is more than a group that meets regularly, it is now a network dedicated to the mission. The CSP serves as a forum to share knowledge and expertise, where competitors and critics can become allies for mutual benefit. One not-for-profit participant explains the value of being connected in the network:

> One of the things which has been kind of an…unexpected benefit is the networks you build and the relationship, so if you have spent the time building trust and you're doing it in a cross-sectoral way with people who would often be your critics, it's really helpful to have those relationships where you've got enough trust in relationship where you know you're going to disagree but actually you can be using each other to help each other be more effective. I think that's a really powerful outcome that we don't always talk about.

The CSP approach has economic benefits, some of which are purely fiscal while others are related to CSR and organisational capability and resilience. The head of partnerships for a public sector organisation said that businesses who support local ecological projects derive benefits such as other opportunities, and access to senior leadership, and the media. One of the key informants, an environmental partnerships leader said,

> When you can purchase those plants and purchase everything you need for pest control collectively and bring the price down, that's good. And when you know that what you're doing is part of a much bigger community then that energizes people.

CSPs for urban ecology are about more than deliverables, they are intrinsically rewarding. They are real friendships, described as rewarding and empowering. A

business owner said, “working from your home on your own, the partnerships feel like soul food.” People benefit by improving their own health and wellbeing. A private sector consultant finds it rewarding, “working with the community and sharing the knowledge with the community and educating, and it is a feel good feel factor”.

Scaled up impact and achievement

Partnership and collaboration provide an opportunity to minimise transaction costs by working together. As a not-for-profit interviewee said, “it makes sense that you join forces, because you might realise that you're kind of doubling up, or people are doing similar pieces of work, and you can make life easier and better for everyone.” CSPs create the potential for scaled up impact because of collaborative advantage. According to the CEO of Zealandia, cross-sector collaboration is “not a simple addition but a multiplication” of impact. “If I operate on my own, almost by definition, I will reach a limit to what I can achieve,” the chief executive explained. The partnership approach is “a much deeper relationship-based thinking about how we achieve our contribution, rather than a formulaic approach,” he elaborated.

The cross-case case analysis showed that the value of a CSP is its ability to unify diverse actors across the system, and provide a forum to tackle complex issues through planned and spontaneous activities. An example of spontaneous self-organisation is one of the cases, the partnership between City Care and the Community Guardians, which emerged after the Christchurch earthquakes of 2011. The CSP began when people across the city joined together to help with the clean-up effort. Almost ten years later, the partnership still exists, with Citycare tapping into the local Community Guardians to complete biodiversity friendly projects across the city. Some of the projects include planting native vegetation, clearing waterways, and bringing back aquatic life.

System change

The case study of Zealandia is an exemplar of a CSP that has brought about system change. When asked about what the CSP is aiming to achieve, the chief executive from Zealandia, the urban ecosanctuary said, “I much prefer the word transformation and I much prefer societal alongside ecological. I think we're in a space of actually changing

the way people think about the natural world, and engage with it." As an organisation, Zealandia has a 500-year vision to restore the 225 hectare ecosanctuary to its pre-human state (Zealandia, 2018). The idea came from a desire to "bring the birds back to Wellington" in the early 1990s and prevent the decline of the city's natural capital (Zealandia, 2018), a long-term imagining of the city's ideal future.

Thirty years later, Zealandia is considered a biodiversity success, with growing numbers of native birds across the city. The approach was to enclose the eco sanctuary in a predator fence to provide a predator-free natural habitat that native species could safely live and breed. Zealandia started as a public-private partnership initially funded by the government, with support from community volunteers and businesses, says one of Zealandia's six trustees, Phillip Meyer (https://youtu.be/UM6UuQjSVQM). For the fourth consecutive year, Zealandia is reporting a positive bottom-line and detailed impacts on community cohesion, increased biodiversity, and health and wellbeing (Zealandia, 2019).

Through a partnership with New Zealand power company, Meridian, free electric vans (EVs) bring shuttle visitors between the city and the sanctuary. The zero emissions EVs, which replaced diesel shuttles, are expected to eliminate 17.75 tonnes of carbon dioxide, which is 19% of Zealandia's annual emissions (EECA, 2019). The introduction of the EVs was a technological innovation being the first time an electric van was converted into passenger transport in New Zealand, and the first licensing type for this purpose. The CEO of Zealandia, Paul Atkins, said "Zealandia has a 500-year restoration vision, and a big part of that be will addressing issues like carbon emissions and climate change." The shuttles are a good way to educate and inform visitors on how sustainability is intertwined with the conserving the natural world.

Are CSPs for urban ecology unique or different in some way?

CSPs for urban ecology were brought together by shared interest in biosecurity, better engagement between people and nature, and biodiversity values. Several participants across sectors said the ecology perspective needs to be part of the strategy of the partnership. This could be done by including scientists, such as ecologists or biodiversity experts. A partnerships advisor for the government said it is critical to

have businesses involved in urban ecology partnerships, “so that we can help to build this social momentum of mass we need to make the scale of change we need to make as a society. They're just too important from that point of view.” Participating in ecological restoration and understanding why is the key to teaching people biodiversity values.

A unique contribution in the study is the focus on urban ecology and the people-nature relationship. This study confirms that CSPs for urban ecological outcomes lead to more synergistic relationships. As explained by a participant, CSPs become self-sustainable as they get the community involved in projects, increase production, upskill local labour, innovate, co-design and adapt along the way.

In many ways, CSPs for urban ecology share overarching connections with CSPs generally, but what makes them unique is the focus on nature. The data was analysed to summarise the high-level themes about each sector in terms of their contribution to the partnership, desired outcome, and suggestions for greater impact (see Table 7 below).

Table 7: A summary of key insights about each sector’s contribution to the partnership, desired outcome, and suggestions for greater impact

	Private sector	**Community**	**Public sector**
Contributes to the partnership	Good business practice Labour, resources and funding Staff engagement Reach to new audiences	Labour Local expertise, eg. trapping, monitoring, weed management, planting, rubbish collection, building tracks All ages, including children are involved	Facilitator of all sectors Biodiversity strategy and accountability Provide supplies, advice, project management and oversight

Desired outcome	Want to support community culture and values Social license to operate	Support with their biodiversity projects	Want to improve community engagement with nature Enhance local biodiversity
Suggestions for greater impact	Need to develop emotional intelligence to improve wellbeing and realise the value of social license Need to understand and enhance biodiversity and community resilience	Having a dedicated coordinator can scale up impact by managing volunteers, events, and communications	Riding the wave of localism and moving to community ownership of projects Tapping into the energetic community

Chapter 5. Discussion

In the literature and confirmed in this study, cross-sector collaboration is an effective strategy to tackle complex problems of the 21st century, such as biodiversity loss (Hajer et al, 2015). As detailed in this study, CSPs are a vehicle to achieve system change by connecting diverse actors across sectors and scaling up CSPs for urban ecological outcomes. When fusing urban ecology and strategic management theory, common themes were identified that apply to partnerships and nature. The purpose was to understand what makes a CSP successful and how that translates into actual impacts for the planet, people and profit. By conducting a cross-case analysis of New Zealand CSPs for urban ecology, a scalable framework was uncovered to solve complex urban ecology problems, such as biodiversity loss and the relationship between people and nature.

This study extends CSP theory by uncovering the biggest barriers, keys to success, and a new approach to scaling up impact. The results show that successful cross-sector collaboration requires long-term thinking, commitment and having the right people involved. As detailed in this study, CSPs scale up impact by creating a coalition of the willing. A network is formed, aligned to contribute towards an aspirational goal. As the network grows, the power and influence of the CSP multiplies, as stated in the literature and confirmed in this study (Stibbe, Reid & Gilbert, 2018; Zollo, 2017). This aligns with two of the guiding principles of urban ecology for scaling up restoration, “bigger is better than smaller” and “connected is better than isolated” (Hobbs & Norton, 1996, p. 104).

Systems thinking for scaled up impact

This study found the systems thinking to be useful way in framing the complexities of CSP strategy, operations and impact (Williams et al., 2017). Management science is evolving from a world built for industrialisation and competition, towards an era of sustainability and collaboration (Stibbe, Reid & Gilbert, 2018). Collaboration is a process that applies a systems approach to solve complex problems by synthesizing diverse perspectives (Whiteman, Walker, & Perego, 2013). According to the findings,

contemporary practitioners say the key to tackling urban ecology issues is to create synergistic relationships and take the long-term view.

As Boulding (1956) predicted, the lack of communications between sectors and disciplines has stalled the growth of society's collective knowledge. When an individual or organisation operates in isolation, there is a missed opportunity for scaled up achievement by combining resources for the greater good. A new insight from this study is that if a person or organisation wants to make an impact towards a societal issue, the new BAU should be to connect with others with shared interest. Collaboration is more resource-efficient and multiples the potential impact (Stibbe, Reid & Gilbert, 2018; Gray & Stites, 2013).

Thinking about CSP participation in terms of interconnectedness, feedback loops and adaptive capacity is valuable to synthesise complex, non-linear problems (Whiteman, Walker, & Perego, 2013). Interconnectedness addresses the need to keep diverse stakeholders across the system informed and aligned. The feedback loops are put in place to monitor progress and maintain engagement. The CSP raises awareness and knowledge about the issue and presents an opportunity to contribute (Gray & Stites, 2013). The CSP acts as a network to connect people, influencing their membership with urban ecology values.

Interconnectedness

As highlighted in the literature and confirmed in this study, CSPs are a way to establish connections between diverse stakeholders, which increases collaboration and the pace of innovation (Bitzer, 2017). CSPs can help to re-establish connections across society in pursuit of a long-term goal or shared values, for instance, biosecurity excellence or bringing the birds back to the city. Many participants expressed the view that there is always a limit to productivity when working on your own. In contrast, collaborative advantage creates mutual benefits that scale up impact.

A new contribution to CSP theory is the idea of the "connector" persona as a key strategy to scale up impact. Some of the CSPs attributed their success to certain individuals within the partnership who were able to attract high-value partners, such as the Biodiversity Sponsorship Manager, who attracted the airport to the Biodiversity

Hawkes Bay partnership. Connectors are highly social and values-driven; they build and maintain strong networks.

Feedback loops

Within urban ecology and strategic management, both disciplines encourage changing relationships from competitive to synergistic to increase effectiveness (Hobbs & Norton, 1996; Hartman & Dhanda, 2018). The results highlighted that in a relationship, open lines of communication channels and social interactions can be likened to feedback loops. Feedback loops are critical for managers to understand as they actively create and react to them (Williams et al., 2017). Establishing channels for two-way communication helps to build relationships, trust, education, and knowledge, which informs strategy. The participants said that good communication scales up impact and resonates with a broader audience.

A new insight from participants is that it is best to connect with existing projects if possible, rather than starting a new project from scratch. Further, interviewees advised it is advantageous to involve the local community as they are key stakeholders. From a strategic perspective, several CSPs explained a shift from organisation-owned projects to community ownership of projects. The CSP is able to scale up urban ecology impact by normalising local conservation. When groups of diverse stakeholders coordinate, they can simultaneously make changes across the system. Ultimately, when an organisation participates in a CSP for urban ecology, they increase the organisation's sensitivity to nature (Starik, 1995).

The partnerships and evaluation framework applied in this study is a visual representation of the impact loops over time (van Tulder et al., 2016). Like a relationship, impact also needs to be built over time. The CSP needs to reach the first order of impact, before there is an opportunity to advance to greater levels impact. System change is the highest order of impact, therefore it needs to be built over a long period of time.

Adaptive capacity

In the literature, adaptive capacity is the ability of actors in the system to maintain basic structure, function and feedbacks, which is an indicator of system resilience (Williams et al., 2017). In the literature, dynamic capabilities are organisational benefits such as learning to manage change, enhancing diversity, and system-level learning. Increasing dynamic capabilities creates the conditions for diverse parts of the system to self-organise in pursuit of the mission (Williams et al., 2017). This is evident across the case studies; in particular, the Biodiversity Hawkes Bay CSP is a good example of how a CSP can build resilience for the planet, people and profit in the region. The CSP strategy is to work with everyone and provide lots of opportunity for engagement and information-sharing.

As detailed in this study, the CSPs enable impacts that would be difficult to accomplish due to cost or complexity. This confirms that collaboration and coordination increase efficiency, productivity and innovation (Witzel, 2012). The case studies show a network of willing participants to complete biodiversity projects which would otherwise be too complicated and expensive to organise. Without The Community Guardians CSP is a good example of how a CSP can bring mutual benefit to the planet, people and profit for generations to come. This theme was confirmed across the six case studies.

Barriers

This study showed the main barriers to effective partnerships are the temporal element, resourcing constraints, and finding the right partner. Partnerships are dynamic relationships which can address societal issues; however, they require time, energy and commitment (Clarke & Crane, 2018). Partnerships for urban ecology require consideration on ecological timeframes, which can be working towards a goal that will not be achieved for tens or hundreds of years. For example, it takes at least 20 years to convert pasture to native forest (Clarkson & Bylsma, 2016). To increase the success of this restoration project, it would take at least 20 years until intensive active management is no longer required. The long-term commitment deters the business sector. It also leads to the second and third biggest barriers, which are resourcing constraints and finding the right partner.

The participants emphasised that taking the long-term view is a way to counteract the barrier of time, especially CSPs for urban ecological outcomes. When tackling complex ecological issues, one of the connectors said his role is to "to take a client to the top of the mountain and show them the view." This study found that taking the long-term view and a landscape perspective engages a broader audience, especially the local community. This insight was reported in urban ecology theory for scaling up restoration (Hobbs & Norton, 1996), and this study confirms it contributes to CSP success.

A new approach to CSP strategy

A simplified framework was developed, based on the findings, to articulate CSP strategy and impact to make it easier for people and organisations to engage in CSPs. The first and second order of impact are internal to the partnership, which includes the partners and project itself (van Tulder et al., 2016). The third and fourth order of impacts monitor impacts external to the partnership, including the benefits to the community and wider society. By applying systems thinking, a pattern emerged that links CSP theory to urban ecology theory, as encouraged by Whiteman, Walker and Perego (2013).

The approach to scaling up CSP impact can be framed in the four stages: Connect, Align, Grow, and Evolve. Based on the partnership monitoring and evaluation framework, the CSP data was matched to the relevant order of impact (van Tulder et al., 2016). Figure 3 below depicts the four orders of impact, paired with a corresponding framework to scale up CSP impact.

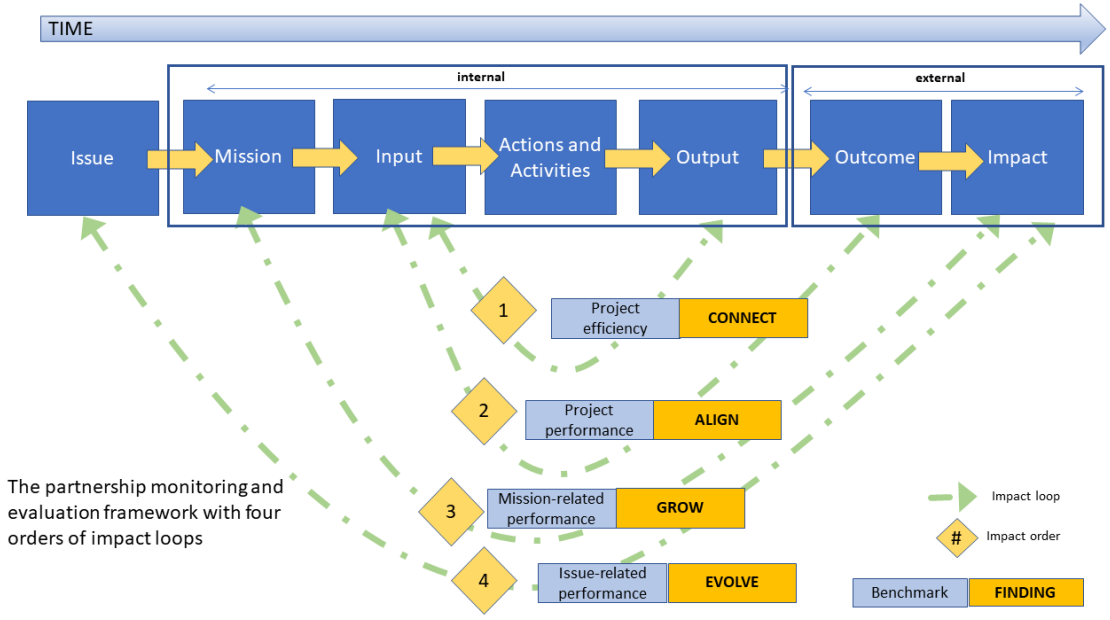

Figure 3: Conceptualising effective cross-sector partnership for greater impact

1st order impact – Connect

In the connecting stage, partners are building a relationship between people, essentially creating a network to tackle the complex problem. This can be fused with the ecological guiding principles for landscape scale restoration, "connected is better than fragmented" (Hobbs & Norton, 1996). The importance of connecting is particularly evident in the CSP for biosecurity excellence, which protects the ecological, social and economic assets of the local community. The network is a central hub for biosecurity knowledge and an alliance of dedicated people across the sector committed to managing the response. A connector is especially valuable to a CSP because they have the right combination of interpersonal skills and dedication to the values and vision. Connectors keep people engaged, bring new people in, and motivate others to be a part of the change.

2nd order impact - Align

Once a group has connected under a common vision or shared values, the foundation has been set for second order impacts. For the second order of impact, the corresponding strategic theme is "*align*". The second order monitors the project performance, measured by comparing the inputs to the outcome (van Tulder et al., 2016). The theme "align" is important because it is up to each partner to incorporate

the values and goals of the partnership into their organisation. Alignment within a partnership increases the impact by amplifying the CSP messages and integrating it into their own practices.

3rd order impact – Grow

At level 3 impact, the CSP has invested the time and effort into getting their project off the ground, and it is time to reap the benefits from delivery of the project activities. The third order of impact is *"grow"*, and it measures mission-related performance by analysing the impact on the mission. At level 3, the CSP has delivered outcomes and is normalising the change through increased reputation and reaching a new audience.

4th order impact – Evolve

The strategic theme for the 4th order impacts is *evolve*, which is on the level of system change, which are the long-term effects on wider society. As detailed in the study, once the CSP gains enough momentum and the right partners, there is potential for real system change. An example of a case study achieving a 4th order impact is how Zealandia has successfully brought the birds back to the city through cross-sector collaboration. This type of system-level impact takes time to achieve, but it impacts everyone who lives in Wellington.

In the 4th order, the CSP was described as a self-sustaining cycle for managing the issue. If you want to plant trees, instead of starting a new organisation, it is more strategic to connect with an existing project. This saves the transaction costs of starting over, and knowledge is retained to minimise re-inventing the wheel. This self-sustaining model for tackling grand challenges aligns with sustainability values, and those values become normalised through partnership. In this way, CSPs can be used as a vehicle for system change.

on the issue is to educate children about bats and give them a hook into environmental protection at a young age. The experience the CSP made possible could be helping to strengthen the people-nature connection.

Evaluating success

It is well-known in the CSP literature that monitoring and reporting is a gap (van Tulder et al., 2016). This study found that there is no consistent way of monitoring and reporting for CSPs. The CSP for biosecurity measures their performance by circulating an annual survey about biodiversity awareness, then adapts their work programme based on the results. This approach aligns with the adaptive management strategy proposed by Hobbs and Norton (1996) for scaling up ecological impacts.

The findings show that success could be measured by participation and engagement. Regular meetings were necessary to decide actions because of the level of coordination required to execute outreach and engagement. The strategy is more robust when it is informed by a diverse group of experts and/or influencers from each sector. For example, the CSP for local bats connects diverse stakeholders that would not normally work together, training volunteers and collecting valuable data about the species. CSP participants emphasised that members of the community should be involved in strategy planning for biodiversity outcomes as they are highly invested in the outcome.

Chapter 6. Conclusion & future research

This research tested the assertion that collaboration is the paradigm of the 21st century (Gray & Stites, 2013) by exploring how CSPs achieve positive impacts for urban ecology. As part of the People, Cities & Nature research programme funded by MBIE (MBIE UOWX1601) six heterogeneous case studies across New Zealand were analysed to find broader, deeper themes related to CSP strategy and impact. The case studies were all focused on partnerships for urban ecology, which is an important topic for the planet's growing cities. Systems thinking enabled the researcher to integrate ecological, social and economic systems over time across the various case studies.

This study demonstrates that anyone can contribute to ecological outcomes through CSP participation. Donations and transactional relationships between business and others sectors is common practice, however the paradigm is shifting towards collaboration. CSPs are a more efficient use of resources than working alone. It is also

more rewarding and impactful to join an existing partnership towards an aspirational goal.

The CSPs in the cross-case analysis provide opportunities for people to connect with nature, improve biodiversity outcomes, and build resilience. CSPs are not rigid models, rather they are a flexible model that enable diverse organisations to align for a goal that may not be reached in their lifetime. It can be difficult to get others on board at first, but having an aspirational vision helps to motivate people across sectors. The level of coordination across a CSP scales up impact by creating opportunities for formal engagement and/or for people to self-organise. CSPs are an efficient way to build resilience and positive impacts for the planet, people and profit, aligning strategy with sustainable outcomes.

Implications for theory and practice

According to this research, an effective way to scale up impacts is to connect with others who have the same goals and/or values. The key to success is to have the right people involved and create a coalition of the willing. The value of the "connector" as a key to CSP success and scaling up impact is a new contribution to theory. For practitioners trying to grow a CSP or a network, this research shows that it is strategic to employ connectors within the partnership. People with the characteristics of a connector have the potential to mobilise large groups of people and role-model behaviour change. Equally, a person with poor interpersonal skills could jeopardise partnership success.

The cross-case analysis shows that there is a lot of potential to scale up collaboration for ecological outcomes. In matters of biodiversity, there is a strong case for focusing on local ecology, which builds social cohesion and ecological resilience. Organisations can take the first step by learning about the biodiversity around them. The framework Connect, Align, Grow and Evolve is a simple way integrate strategy and impact, making it more accessible to all sectors.

UN SDG #17, partnerships for the goals, can scale up impact by broadening its focus to include partnerships on all levels. It is currently focused on international partnerships (Sustainable Development Goals Knowledge Platform, 2019). This research proves that

domestic partnerships can be a way to build resilience across local, regional and nationally scales.

Future research

More studies exploring urban ecology should apply a systems thinking lens to consider outcomes related to all the pillars of sustainability. During my study, I found that youth is a stakeholder that is largely overlooked in management literature. It is important to capture intergenerational perspectives for successful system change. More research is needed to explore the role of youth in system change for social value, for example, to achieve the SDGs by 2030.

Clarifying language of impact will help to provide more precise reporting on impacts of CSPs. Using common terminology should improve communication between people, smoothing some of the partnership challenges. It would be good to test the Connect, Align, Grow, Evolve framework to partnerships as a way to demystify CSPs. As more CSPs begin regular monitoring and evaluation regimes, measuring impact will eventually be normalised. The lack of monitoring and evaluation can be improved by using the strategic management tools, such as the impact value chain and partnership monitoring and evaluation framework.

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Appendix 1: Case Summaries

(Direct quotes from case study interviews with participants)

Zealandia

It is the last thing you would expect to find in a major city. It is full of birds, bugs and bushes that spill out into the centre of New Zealand's capital. Celebrated as an ecological triumph, Wellington is one of the only cities in the world where the diversity of native birds is increasing, a change driven in large part by the establishment of Zealandia in 1997 (see www.visitzealandia.com). Located just 3 kilometers from downtown Wellington, Zealandia is a 225 hectare ecosanctuary. Zealandia is an urban ecological breakthrough; a mainland sanctuary with a uniquely designed predator-proof fence, enabling the ecological clock to return a part of Wellington back the way it was 1,000 years ago. Zealandia does not think in quarterly plans or even 5-year strategies; their 500-year vision is to restore the valley's forest and freshwater ecosystems as closely as possible to their pre-human state. How do they expect to achieve such a transformational goal? Partnerships.

Community Guardians

Community Guardians is an initiative between Citycare Group and Sam Johnson's Student Volunteer Army (SVA) to fund volunteer work for those caring for community areas, local parks, and helping in the community. The focus is on planting native vegetation, clearing the waterways and bringing back marine life. The initiative started when Citycare Group were contracted to mow and tend to gardens in the red zone of Christchurch, a public exclusion zone implemented after the 22 February 2011 earthquake. A local retiree had started to mow lawns and grassy areas in the red-zone after the 2011 earthquake left the area uninhabitable. After the earthquake, the gardens grew to jungles, including his own previously well cared for garden, so he decided to dedicate his time to tidy his own, and shortly after others around it. When Citycare Group were contracted to take over the job, the local retiree refused to leave,

so the company instead paid for his petrol and mower maintenance costs, making him the first volunteer Community Guardian. Citycare Group reignited their partnership with SVA to continue this idea, and things grew from there. Citycare Group CEO Onno Mulder said, "instead of traditional sponsorships where corporates hand out cash, this is an entirely new concept. It's all about facilitating true community partnerships." The partnership was recognised for its contribution to the community when it won the New Zealand Recreation Association Award for Outstanding Community Recreation Programme in October 2018. The idea started in Christchurch, the birthplace of Citycare group, but has plans to grow nationwide, one of the reasons that it hasn't been branded as Citycare Community Guardians as per the original plan, having a neutral name allows for different cities to adapt the model and for councils to take ownership of it (watch what they do here https://www.youtube.com/watch?v=yljp7ddrcls).

Tauranga Moana Biosecurity Capital (TMBC)

Tauranga is New Zealand's fifth largest city, surrounded by coastal views, the mountainous Kaimai Range, and featuring the volcanic cone of Mt Maunganui, it is also one of New Zealand's fastest growing cities, the population was projected to increase 37% from 2013 to 2033, meaning rapid urban development will be occurring across the city. Tauranga Moana Biosecurity Capital (TMBC) is a network of organisations agreeing to work together for the good of the environment. The focus of the TMBC case is on the biosecurity aspect of urban ecology. The collaboration started in October 2018, the first of its kind in New Zealand, with the intent of raising local awareness of why biosecurity is important, and what can be lost from exotic pests and diseases entering the Tauranga region (watch TMBC launch https://www.youtube.com/watch?v=2REIj9Qe5ss). The organisation promotes and coordinates biosecurity actions across the region, focussing on partnerships, connections, and collaborations to achieve biosecurity excellence. TMBC is an initiative attached to the government's Ko Tātou This Is Us campaign, in which every New Zealander is urged to think about what we gain from our environment, and be involved in biosecurity to protect it the best we can. TMBC hopes that other regions will adapt their model of biosecurity and, like Ko Tātou This Is Us, that everyone will work together to create a 4.7 million person biosecurity team across New Zealand

(watch the Ko Tātou This Is Us campaign here https://www.youtube.com/watch?v=5lqvHsHAWP8).

Hammond Bush

Hammond Bush is a case focused on a project that has had difficulty sustaining partnerships, particularly with business. Hammond Bush is one of the last remnants of native bush in Hamilton City. Filled with native vegetation and bursting with native birds, it is a local treasure for walkers, bird enthusiasts, and people wanting to escape the city for a while. Located within Hammond Park, it has been loyally protected and restored by the Riverlea Environmental Society Inc (RESI), and a previous Riverlea group before them, which has been instrumental in the bush's growth since 1999. RESI and residents meet monthly to weed, plant, and trap within the bush to help it flourish and keep wildlife safe, as well as working with properties adjacent to the bush encouraging weeding and trapping in backyards to increase impact. The groups involved are struggling to find support from other organisations to help them with their goals. Former leader of the RESI group, Andrea Graves, feels that partnerships can be a successful model, and although RESI were able to secure a few around Hamilton, they were not always long lasting, especially with businesses. According to Graves, poor communication between organisations led to dissatisfaction of partners and goals not being met. This meant that RESI relies heavily on other community groups, councils, and volunteers for support, both financially and actively.

Biodiversity Hawke's Bay

Starting in early 2018, Biodiversity Hawke's Bay formed as a collaboration of Iwi (New Zealand's indigenous people), government, business and community groups for the purpose of improving the region's biodiversity (watch https://www.youtube.com/watch?v=XxNYom70Lv0&t=9s). In 2013, an inventory conducted by Hawke's Bay Regional Council of the biodiversity within the region, was the starting point of the Biodiversity Strategy for Hawke's Bay, which outlined the need for more alignment in values across sectors and organisations across the region in order

to reach the goal of habitats and native species populations being enhanced, healthy, and functioning by 2050. Hawke's Bay Biodiversity includes three entities: 1. Hawke's Bay Biodiversity Forum, to grow and connect the conservation community; 2. Biodiversity Guardians of Hawke's Bay, a formally constituted group, the Guardians oversee the work of the Forum and; 3. Hawke's Bay Biodiversity Foundation, formed to secure funds needed, with an objective to build a $10 M endowment fund.

Vector Urban Forest

The focus of this case is on a business led cross-sector partnership focused on urban ecology. Vector Energy Ltd has an initiative to increase nature across the city. Called 'Vector Urban Forest', the energy company has promised to plant two native trees for every tree they cut down to protect Auckland's powerlines. Trees around power lines can be dangerous, branches can break onto the lines in strong winds causing damage. Full trees can fall on the lines during storms or dead trees breaking can cause outages, and oversized trees can make it difficult for teams to reach the lines to fix any issues and make it dangerous for them. The project, a collaboration among Vector, Auckland Council (local government) and community groups, is working to bring awareness to planting smartly and maintaining trees around power lines for safety and lowering the likelihood of damages and outages. One of Vector's Urban Forest's aims is for communities to understand the types of trees suitable for planting around power lines, providing a list of native and exotic trees that are appropriate. It is also enables the social and environmental outcomes that increased tree presence in urban areas brings (watch Treescape and Vector on a planting day for Urban Forest here: https://www.youtube.com/watch?v=vB3zGs7IdZU).

Appendix 2: Interview guide

Date of Interview: _____

Interviewee Information

Do you have any questions about the study before we begin?

Can we use your name and organisation's name after you have reviewed the content?

Organisation name

Interviewee first name

Role at organisation

Amount of time working at organisation

CSP Questions

1. Describe your approach to partnerships - when do you partner, who do you choose to partner with and why?
    a. What are the benefits of working together?
    b. What are the roadblocks
2. What are you trying to achieve with this partnership?
    a. What are your specific goals
    b. How are goals communicated?
3. How did you implement the strategy?
4. Would you be able to achieve the desired outcome another way?
5. What are the positive outcomes you've achieved?
    a. Please specify any biodiversity outcomes
        i. Why did you choose to pursue these outcomes?
    b. Please specify all other environmental outcomes
        i. Why did you choose to pursue these outcomes?
6. What are your metrics for success for the partnership (evaluation)?

7. What advice do you have for others who want to engage in partnerships?
8. Is there anything else you want to talk about regarding partnerships that we have not covered?

Thank you for contributing to this research. Your time and effort is appreciated. We will share with you any outputs of this research.

Appendix 3: Participant information & disclosures

Participant Information Sheet

Waikato Management Schoo
Te Raupapa

THE UNIVERSITY OF WAIKATO
Te Whare Wānanga o Waikato

Research project: Cross-Sector Partnerships for Urban Ecology

Researcher's name and contact information:

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Researcher

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Purpose of the research

Commerce is the lifeblood of urban economies and biodiversity is the heart of urban ecology. If those two forces can be aligned, businesses and communities will both benefit.

This research is part of a MBIE-funded Endeavour research programme entitled, "People, Cities and Nature: Restoring indigenous nature in urban environments" (https://www.peoplecitiesnature.co.nz/). This part of the research focuses on: **How cross-sector partnerships can be structured and implemented to achieve effective ecological restoration in urban New Zealand**.

Objectives of the research include:

- Investigate case study, cross-sector partnerships for urban ecological restoration in New Zealand.
- Identify the metrics for success for each partner to quantify and track their accomplishments, and detect and address emerging problems (Babiak, 2009).
- Evaluate the impact of the case study partnerships, specifically the biodiversity value of the partnership.
- Determine best practice, in a New Zealand context, for the structure and implementation of cross-sector partnerships for effective urban ecological restoration.
- Identify antecedent conditions to replicate effective cross-sector partnerships

What is involved?

You are invited to participate in this research. This involves partaking in an interview lasting approximately 30 – 60 minutes at a time and place that is convenient to you. The questions will be provided in advance and based around your involvement in cross-sector partnerships that includes biodiversity outcomes.

What will happen to the information?

The digitally recorded interview will only be available to myself and the research team. Your name and title will be identified with your quotes in published materials from the research. Anticipated research outputs include a journal article(s), presentation(s) to government and business groups interested in business and sustainability. Your name will only be identified in published material (in any of the named media) if your permission has been given to do so. In addition, you will have the opportunity to review the quotes attributed to you and to correct or remove quotes for any reason before publication. If you choose to opt out of the research after the interview, you will have two weeks from the interview to notify me of your withdrawal from the research. All participants will be provided a copy of any published material.

For more information

Thank you for your time and for considering this request to participate in the research. Should you require further information at any time, please contact me via the e-mail or phone given above.

Appendix 4: Level 1 and 2 coding

Name	Files	References
Advice for new partners	28	107
What could go wrong	18	42
Barriers	29	297
Complexity & temporal element	21	64
Finding the right partner	20	54
Misalignment of partners	16	24
Misunderstanding partnerships	20	42
Resourcing constraints	22	56
Tensions	19	41
Turnover	12	16
Biodiversity	28	262
Examples of partnerships	29	187
How to be effective	30	415
Connectors	17	42
Diversity of culture and expertise	25	94
Monitoring, measurement and evaluation	29	86
Partnership skills	30	193
How to partner	30	736
Add value	10	16
Build relationships	28	105
Co-design, collaborate, coordinate	26	70
Complementary resources	24	59

Long-term commitment	19	36
Mutual benefit	25	70
Opportunities	24	68
Partnership agreements	21	52
Partnerships are inherently challenging	26	71
Shared outcomes and values	29	106
Understanding other sectors' context	26	83
Impact & benefits to organisation and community	30	376
Benefits to organisation and community	30	220
Scaled up impact and achievement	28	126
System change	9	30
Organisational capability and culture	30	259
Business	14	23
Clear organisational strategy	27	76
Collaboration capacity and dynamic capability	21	41
Having the right people involved	29	119
Strategy	30	547
Goals	23	48
Governance & accountability	23	45
Innovation	22	68
Investment	23	51
Long-term vision	28	91
Outcomes - success and failure	26	78
Planning & Implementation	23	51
Tactics	28	115

System concepts of partnerships	30	316
Alignment	21	53
Connect	22	76
Evolution, Dynamic	22	68
Grow	20	35
Network	22	84
System change	9	30