

A Sustainability Assessment of the Harte Trail

by

Bailey Alexander Martin

A Thesis Submitted to the Faculty of Social and Applied Sciences

in Partial Fulfilment of the Requirements for the Degree of

Master of Arts in Environment and Management

Royal Roads University

Victoria, British Columbia, Canada

Supervisor: Dr. Harvey Lemelin

April, 2025

© Bailey Alexander Martin, 2025

## COMMITTEE APPROVAL

The members of Bailey Alexander Martin's Thesis Committee certify that they have read the thesis titled A Sustainability Assessment of the Harte Trail and recommend that it be accepted as fulfilling the thesis requirements for the Degree of Master of Arts in Environment and Management:

Leslie King [signature on file]

Final approval and acceptance of this thesis is contingent upon submission of the final copy of the thesis to Royal Roads University. The thesis supervisor confirms to have read this thesis and recommends that it be accepted as fulfilling the thesis requirements:

Harvey Lemelin [signature on file]

## **Abstract**

The Harte Trail is a 6.5-kilometre urban parcel of land located within the neighbourhood of Charleswood in Winnipeg, Manitoba. The Harte Trail is significant to the community's leisure needs while supplying benefits of active transportation, environmental education, and biodiversity preservation. These benefits exist because the trail provides infrastructures and areas where people can conduct recreation, appreciate nature, strengthen community bonds, learn, and support sustainability initiatives. Several stakeholder groups manage this trail, primarily the *City of Winnipeg*, *Friends of the Harte Trail*, *Manitoba Trails Association*, and broadly, the *general public*. This sustainability assessment, based on key-informant interviews with members of stakeholder groups and a public engagement survey, led to recommendations about how regenerative sustainability could apply. The results indicated several areas where the trail can be improved. For example, reviewing infrastructure possibilities, forming partnerships, and preserving the existing strengths.

**Key phrases:** *Sustainability, Harte Trail, Stakeholder Engagement, Regenerative Sustainability.*

## **Acknowledgments**

First, I would like to thank everyone who has helped me throughout this process, including the study participants. Specifically, I would like to thank Dr. Harvey Lemelin, Dr. Leslie King, and Dr. Sarah Wolfe. Your support and knowledge were so greatly appreciated. This study would not have finished without each of you. You are forever in my gratitude. I would also like to acknowledge my colleagues, who's continuous support helped push me to complete this task. This experience has been a challenging yet highly beneficial process to my learning capabilities, and I am grateful to have been granted the opportunity to undertake this project. I also want to thank the Royal Roads institution for my time with them. It has been an incredible few years that I will always look back on fondly. I also would like to thank the City of Winnipeg Libraries, where much of this writing took place. These spaces are essential for education, research, and community building, and I hope their state of being is improved. Finally, I would be remiss if I did not acknowledge the Harte Trail. It has always been a fascinating and intriguing area, and studying its intricacies has genuinely been a blessing. I hope this research helps the trail and it will continue to be around for future generations.

## Table of Contents

Abstract.....	1
Acknowledgements.....	2
List of Figures.....	5
Introduction.....	6
<i>Harte Trail: description</i> .....	7
<i>Stakeholders</i> .....	9
<i>Significance of study</i> .....	10
Purpose of Study.....	11
Literature Review.....	12
<i>Harte Trail: context</i> .....	12
<i>Trail management</i> .....	15
<i>Benefits of protected areas</i> .....	18
<i>Environmental education</i> .....	20
<i>Active transportation corridors</i> .....	22
<i>Biodiversity</i> .....	25
<i>Sustainability</i> .....	27
<i>Relevance to study</i> .....	30
Methodology and Methods.....	31
<i>Data collection</i> .....	32
<i>Researcher disclosure</i> .....	33
<i>Public engagement survey</i> .....	34
<i>Key informant interviews</i> .....	35
<i>Data analysis</i> .....	37
Results.....	41
<i>Public engagement survey findings</i> .....	41

<i>Survey summary</i> .....	46
<i>Key informant interview findings</i> .....	47
<i>Respondent interview summary</i> .....	51
Discussion.....	52
<i>Strengths</i> .....	52
<i>Weaknesses</i> .....	53
<i>Limitations</i> .....	54
Conclusion and Recommendations .....	56
<i>Conclusion</i> .....	56
<i>Recommendations</i> .....	58
I) <i>Create a well-defined management plan</i> .....	58
II) <i>Partnerships with other organizations</i> .....	59
III) <i>Partnerships with Indigenous peoples</i> .....	59
IV) <i>Review infrastructure possibilities</i> .....	60
V) <i>Continue support</i> .....	61
<i>Study Summary</i> .....	61
References.....	62
Appendices.....	76
<i>Appendix A</i> .....	76
<i>Appendix B</i> .....	77
<i>Appendix C</i> .....	78
<i>Appendix D</i> .....	80
<i>Appendix E</i> .....	82
<i>Appendix F</i> .....	83
<i>Appendix G</i> .....	84
<i>Appendix H</i> .....	95

## List of Figures

Figure 1.....	8
Figure 2.....	36
Figure 3.....	39
Figure 4.....	42
Figure 5.....	46

## Introduction

Various municipalities manage municipal parks and trails in the province of Manitoba. This study occurs in the municipality of Winnipeg, the largest urban center in Manitoba and home to well over fifty percent of the provincial population (Statistics Canada, 2016). Winnipeg is divided into eight distinct constituencies based on location and population density within the city. This study focuses on the Harte Trail, a protected area within the Winnipeg constituency of Charleswood. The study investigates the sustainability of the Harte Trail and showcases improvements that could be made to enhance it. Protected areas within Winnipeg operate under the *City of Winnipeg Charter*, which paves the way for Winnipeg's *Parks By-law*. Four purposes are outlined in the *City of Winnipeg Charter*. These purposes are:

- (a) “to provide good government for the city;
- (b) to provide services, facilities or other things that the council considers to be necessary or desirable for all or part of the city;
- (c) to develop and maintain safe, orderly, viable and sustainable communities; and
- (d) to promote and maintain the inhabitants' health, safety, and welfare.” (City of Winnipeg Charter, 2002, para 5.1).

Establishing the *City of Winnipeg Charter* allows Winnipeg's municipal government to operate semi-independently of Manitoba's provincial government. One example of this autonomy is the management of municipal parks and trails in Winnipeg. The Parks By-law governs public property within Winnipeg's purview, such as parks, trails, protected spaces, or any other areas jointly operated by the City of Winnipeg, zoned as a park, or used principally for outdoor recreation (Parks By-law, 2009). Three purposes exist for this by-law, of which each can be classified as a social, environmental, and economic concern. These purposes are stated as follows:

- (a) “maximize the opportunity of members of the public to enjoy a wide range of recreational and leisure activities within City parks safely, comfortably and conveniently;
- (b) Minimize:

- (i) “risks to public health, safety and security;
  - (ii) risks of damage or harm to parks, including animals, animal habitat and flora within parks; and
  - (iii) risks of harm to the environment generally; and
- (c) ensure to the greatest extent possible that any damage or harm to parks is remedied and appropriate compensation is provided to the City of Winnipeg.” (Parks By-law, 2009, p. 2-3).

The City of Winnipeg *Public Works Department* is the municipal body responsible for managing Winnipeg’s parks and protected areas. The *Public Works* Department includes many things, such as the *Parks and Open Spaces* division or *Naturalist Services*. Parks and Open Spaces are responsible for managing City of Winnipeg-owned parks. They provide garbage collection, grass cutting, and snow plowing in city parks. They also assist with boulevard maintenance, such as grass cutting and weed and sand removal in designated areas across Winnipeg. Naturalist Services is a specialized department within the Parks and Open Spaces division. The group’s primary goal is safeguarding and overseeing ecologically significant naturalized locations across Winnipeg (City of Winnipeg, 2020). The group provides habitat grading and assessment, invasive species management responses, and managing and restoring natural areas.

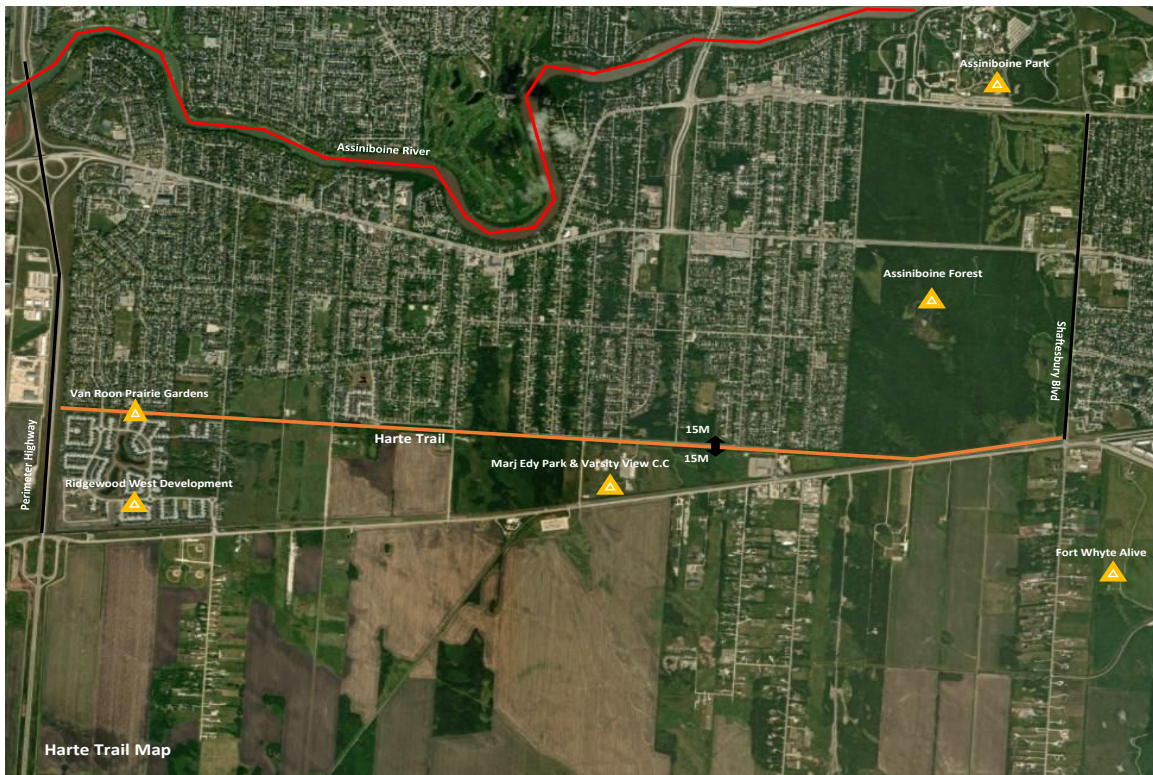
***Harte Trail: description***

The Harte Trail is a linear path that runs through the southwestern Winnipeg neighbourhood of Charleswood. The area is officially classified as a municipal park under the City of Winnipeg Parks By-Law. For consistency, this study uses the following terms: Harte Trail and “the trail” to denote this municipal park. The direct management area encompasses roughly 15 meters on either side of the path. There are a few notable features directly along the trail’s duration, such as Marj Edy Park, Varsity View Community Centre, and the Van Roon Prairie Gardens. The trail is between two significant regional

streets, Shaftesbury Boulevard to the east and the Perimeter Highway to the west. Several more minor roads run parallel to the trail within the Charleswood neighbourhood.

Additionally, four areas of interest are located near the Harte Trail. Assiniboine River and Assiniboine Park to the north, while the trail is directly adjacent to the southern edge of Assiniboine Forest. Fort Whyte Alive is located southeast of the trail. Ridgewood West is a new development in Charleswood that is currently being developed along the southwest portion of the trail. The significance of the trail and its various connections are explored in greater depth within the literature review section of this study. 'Figure 1' below illustrates the location of the Harte Trail in Winnipeg.

**Figure 1.**



*Harte Trail Map*

*Note.* Created using Microsoft Publisher.

Source: GIS Image taken from Bing Maps and used under fair dealing for educational purposes.

## ***Stakeholders***

Several stakeholder groups play varying roles in managing or facilitating functions and improvements along the Harte Trail. As stated earlier, the City of Winnipeg's Public Works Department is ultimately responsible for managing the Harte Trail. However, smaller sub-departments such as Parks and Open Spaces and Naturalist Services are critically involved in the management of the trail. Parks and Open Spaces focuses more on the maintenance of the area, such as garbage pickup and snowplowing. In contrast, Naturalist Services focuses on preserving the area, such as managing the local ecosystem. These two bodies play a sizeable organizational role in managing the Harte Trail for the City of Winnipeg.

Other organizations and associations are involved in managing the Harte Trail. One of these groups is the Friends of the Harte Trail. This volunteer organization coordinates and assists with projects throughout the trail. This group facilitates events such as tree plantings and annual litter pickups. The group comprises concerned citizens who want to see the Harte Trail flourish well into the future. The group is seen as the primary spokesperson for the Harte Trail. They are consulted before management decisions and often work with top decision-makers to fix issues, or work proactively with municipal agencies. Friends of the Harte Trail members are actively working to advocate for the betterment of the trail with government officials.

Trails Manitoba is another organization that plays a role in managing this and other trails in Manitoba. This provincial organization focuses on promoting recreational trails throughout Manitoba. They also provide grants to improve existing infrastructure or create new infrastructure altogether. The group is focused more on big-picture ideas and helps facilitate practical steps to make projects happen. They work with decision-makers to provide a strategic direction for the Harte Trail by providing resources to improve the system. Additional stakeholders of the Harte Trail include the general public (infrequent users to daily users and/or active commuters). In this instance, the public is considered anyone with a vested interest in the Harte Trail.

### *Significance of the study*

Trails are vital recreational areas for leisure activities (Lynch et al., 2002; Maria et al., 2018). While there are several instances of these leisure pursuits, they all have one thing in common: they all take place outside, where the natural world surrounds the participant (Moore & Ross, 1998). The natural world in an urban setting refers to any aspect of nature that coexists with society. Trails offer the chance to become more conscious of nature and advantages like active forms of transportation, the preservation of open space, a sense of place, and even the economy (Moore & Ross, 1998; Cook, 2017). Trails are frequently located in fragile natural zones (Lynn & Brown, 2003; Winter et al., 2019). These areas offer a unique chance for environmental education activities which help foster environmentally conscious citizens and emphasize the significance of effective environmental management through continued preservation of the area (Swan, 1971; Moore & Ross, 1998; Timothy & Boyd, 2014). Given the trail's location near residential areas, parks, connections to other transportation links, and its frequent use, it is important to assess how effectively the Harte Trail supports these opportunities. Additionally, it is helpful for trail users and decision-makers to identify ways to improve the trail within sustainable parameters. Ideally, this will contribute to the long-term maintenance of the trail and will assist in future improvement projects that various stakeholder groups may undertake.

A gap exists in the knowledge surrounding trail and recreation management in Winnipeg. A sustainability assessment of the Harte Trail contributes to filling that gap. It benefits decision-making by municipal governments, local organizations, and local citizens while providing insights into the current function of a trail in the municipality. Even though the findings may not apply to every part of Winnipeg, they can still enrich ideas for future studies. Considerations presented in this thesis may boost the understanding of how Winnipeg's broader trails and parks system functions. With further research, this understanding may help improve community experiences for outdoor recreation in the city.

## **Purpose of the study**

This qualitative study is designed to investigate the Harte Trail's current functionality and explore potential areas for enhancement through the lens of sustainability sciences. The following research question is at the heart of this study.

1. What aspects of trail management of the Harte Trail in Winnipeg, Manitoba, can be improved to generate more sustainable outcomes?

From this central question, three primary research objectives were derived.

1. Examine the current state of the Harte Trail.
2. Identify strengths and weaknesses of the current system surrounding the Harte Trail.
3. Provide recommendations for regenerative practices of the Harte Trail.

The general framework of a sustainability assessment is used as the primary research method to fulfill each objective and help answer the research question. This assessment is fulfilled using a qualitative case study approach to explore the intrinsic value of the Harte Trail while also bringing new variables to light. Two data collection methods were used to gain the necessary information to study the Harte Trail: key-informant interviews and a public engagement survey. Key stakeholder groups which play critical roles in the Harte Trail system were contacted to participate in interviews. Individual participants from these stakeholder groups shared insights about the current functioning of the Harte Trail, relating to how it currently operates and some strengths and weaknesses of the management system. Members of the public were also invited to complete a public engagement survey designed to capture current public perceptions and experiences on the Harte Trail.

Data gained from these methods were analyzed using the principles of qualitative data analysis. Each question was classified as a dataset and was independently put through a data analysis guide to help examine trends within the data. Trends were established following this analysis, which formulated the basis for the recommended implementation of several regenerative practices to bolster sustainable practices on the trail.

## **Literature Review**

The literature review provides an overview of the links between various concepts in protected areas, trail management, and sustainability sciences. Each area reviewed in this chapter forms the basis for the sustainability assessment conducted on the *Harte Trail*. First, it is necessary to provide a detailed description of the case study at hand. This description highlights the Harte Trail and provides the required context for this study. Management of the Harte Trail is a primary concern, and it is necessary to explore how good trail management is typically undertaken. When a protected area such as a trail is adequately managed, it benefits people in various ways. Concepts such as environmental education, active transportation, and biodiversity conservation are domains in which trail management benefits. Regenerative practices can be used to change management policies and procedures to help create a collaborative system that creates sustainability. Defining and examining these concepts below showcases their merits and displays why the Harte Trail should work as a tool to promote them. The chapter concludes by summarizing the link between the literature reviewed and the purpose of the study.

### ***Harte Trail: context***

The Harte Trail features roughly fifteen meters on either side of the path; the Harte Trail is defined as a municipal park by the City of Winnipeg. However, the park is managed as a trail for all intended purposes. The Harte Trail is a segment of land 6.5 kilometres in length located chiefly in the Charleswood neighbourhood in western Winnipeg. The trail runs in a linear west-to-east direction. The boundaries of the Harte Trail run between two large roads, Shaftesbury Boulevard on the east, which borders the neighbourhood of Tuxedo, and the Perimeter Highway on the west, which borders the municipality of Headingley. Many more minor roads run parallel to the Harte Trail. The trail has several notable features adjacent to the path or within its management area. For example, the Van Roon prairie gardens are on the western edge, while the Assiniboine Forest is on the eastern edge. Both areas were established as ways to preserve and showcase the culture and natural history of Charleswood and

Winnipeg. The Marj Edy Park and Varsity View Community Center are found on the southern part of the trail. These adjacent areas allow trail users to use large open green spaces or other areas to practice recreation. The Harte Trail is in an area uniquely situated to support nature and service the recreational needs of residents.

As a significant local attraction, the Harte Trail receives much media attention about its strengths and weaknesses (McFee, 2020; Driedger, 2022; Keele, 2023). The Harte Trail is classified as a multi-use area intended for many recreational activities (McGavock et al., 2022). For example, walking, biking, jogging, bird watching, and family activities are all permitted throughout the trail. Biodiversity refers to the heterogeneity of living organisms and ecosystems within an area, including variability within species, among species, and of ecosystems (Convention on Biological Diversity, 1992). Biodiversity is a subject of critical importance on the Harte Trail. The area surrounding the trail is primarily encompassed by deciduous forests within a prairie ecosystem. The City of Winnipeg Naturalist Services provided a habitat site assessment for the area in 2002, and they identified sixty-six different types of plant species in the area (Naturalist Services Branch, 2002). The primary habitat types identified by this assessment were aspen forest, oak forest, and wetland. Forty-two of these identified plant species are considered native to Winnipeg, while thirteen are considered introduced. Eleven species are of unknown origin (Naturalist Services Branch, 2002). Prairie grasses such as prairie cordgrass, big bluestem, and reed grass are found along the trail, with a host of native wildflowers, non-native grasses, and tree species (Naturalist Services Branch, 2002). While no exhaustive list of animal species existing on the trail has been published, several people and organizations have stated that many species of rabbits, foxes, deer, coyotes, rodents, and dozens of bird and insect species (including pollinators) have been seen along the trail (Friends of the Harte Trail, 2019; Qualico Communities, 2024). The popular website eBird is a global citizen science platform for bird watchers and researchers; it is managed by the Cornell Lab of Ornithology (Cornell Lab of Ornithology, 2025). While the Harte Trail is not a defined area on this website, the adjacent

Assiniboine Forest is. Over 200 species of birds have been identified in this area, with the three most common being House Sparrows, Rock Pigeons, and Canada Geese (eBird, 2025).

The Harte Trail is single-laned and comprised of smashed gravel. It features various directional signage, commemorative founding plaques, and interpretive panels. Today, the Harte Trail is used primarily for transportation and leisure activities such as cycling, walking, and jogging (Minkus, 2021; Driedger, 2022). Historically, the Harte Trail was an active railway line used by the Grand Trunk Pacific Railway in 1907 (Minkus, 2021; Driedger, 2022). By 1923, the tracks had become part of a significant rail line used by the Canadian National Railway (CN). The line remained in use until 1974 (Minkus, 2021; Driedger, 2022). Initially, the abandoned tracks were planned to be turned into a road. However, the Charleswood community banded together and advocated for the area to become a permanent recreational trail (Minkus, 2021). The trail gained official status in 1999 and, by 2000, had become part of the Trans-Canada trail system (Minkus, 2021; Driedger, 2022). The Trans-Canada trail system is a network of urban and rural trails nationwide. These connected trails allow people to strengthen bonds with nature and traverse through diverse Canadian landscapes (Odjick, 2000; Pringle, 2017; Driedger, 2022).

A vital feature of the Harte Trail is the concept of connection. Not only is it connected to Canada through the Trans-Canada trail system, but it is also well situated to other areas within Winnipeg. Fort Whyte Alive is located just south of the trail, while Assiniboine Park is located to the north. *Fort Whyte Alive* is a 660-acre urban green space that connects people with nature (Fort Whyte Alive, 2024). Fort Whyte Alive is a leader in environmental education and plays an integral role in conserving urban biodiversity in Winnipeg. Assiniboine Park is a central feature of Winnipeg. The park is over 400 acres large and includes attractions such as the Winnipeg Zoo and the indoor horticultural gardens known as The Leaf (Assiniboine Park Conservancy, 2022). The Harte Trail is uniquely located between these two critical areas, providing a connection corridor to both.

Running through the Charleswood residential neighbourhood, the Harte Trail is an excellent example of a naturalized area existing in an urban setting. Its location allows people to connect with

nature easily and offers a habitat for local flora and fauna. The preservation of the Harte Trail became notable around 2010 when the City of Winnipeg announced plans to allow a proposed housing project near the southwestern edge of the trail. After much discussion with local community groups, stakeholders, and the public, in 2012, a plan was formulated to build the housing project while preserving the trail. With most of the development now built, it is necessary to assess the current sustainability of the Harte Trail, determine challenges, and examine strategies for continual improvement. This assessment is achieved by evaluating the trail management of the Harte Trail and its role in promoting sustainability in Winnipeg.

### ***Trail management***

Before we examine trail management, we must first define what trails are. Trails are segments of land that were historically used for migration, hunting and gathering, herding, and trading. (Timothy & Boyd, 2014). Today, trails can best be described as routes made for recreational use, conservation management, areas to practice physical activity outdoors, or places to build a sense of connection with nature (Zhang et al., 2017; National Parks Service, 2018). A primary role of a trail is to provide opportunities for people to practice various forms of recreation. (Bainbridge, 1974; Moore & Ross, 1998; Timothy & Boyd, 2014). The focus of this assessment is on urban multi-use trails. An urban multi-use trail is a shared pathway in a populated area that serves cyclists and pedestrians alike (Ermagun et al., 2018; McGavok et al., 2022). As we previously outlined, some trails are protected through various designations (municipal, provincial, and federal). As previously discussed, the Harte Trail is protected through municipal legislation (i.e., Parks By-law).

Allowing people to use trails is beneficial ecologically, socially, and economically (National Parks Service, 2018; Alberta Parks, 2023). Trails help provide essential ecosystem services such as improved air and water quality, reduced emissions, and aid in healthy soil formation (National Parks Service, 2018; Alberta Parks, 2023). Socially, trails are beneficial in how they provide benefits to human health (Loh et al., 2011; Timothy & Boyd, 2014; Lee, 2020). Improved mental health, improved physical

health, increased appreciation of nature, and a heightened sense of place are all acknowledged as benefits derived from protected areas such as trails (Moore & Ross, 1998; Cook, 2017; Lee, 2020). Economically, proximity to trails is linked to increased tourism, cost savings on vehicle transportation, and higher property values (Moore & Ross, 1998; Cook, 2017; Alberta Parks, 2023). Since trails are often situated in ecologically sensitive areas, these locations provide a unique opportunity for environmental education initiatives but highlight the need for proper area management. (Moore & Ross, 1998; Timothy & Boyd, 2014; Lin & Lee, 2020).

Several authors (see Harnik, 2021; Huemer et al., 2018; Jordan & Leso, 2000) suggest that the most crucial issue facing the management of urban trails is that of dangerous intersections (i.e., roadways) (Harnik, 2021) and user conflicts. Challenges created by dangerous intersections are discussed later. Next, we focus on user conflicts. Users of the Harte Trail include walkers, runners, cyclists, and other recreationists. Conflicts between recreationists and drivers (at intersection points), dog walkers and other recreationists, and cyclists and other recreationists have been documented along trails (including the Harte Trail) (Huemer et al., 2018). Management strategies to minimize these impacts include social media strategies to inform users regarding codes of conduct, signage, and painting lines on shared-use pathways to designate the right of way (Jordan & Leso, 2000).

In addition to problems caused by recreationists, ecological issues such as soil compaction, erosion, vegetative disturbance, and disruption of local wildlife may occur along trails (Bainbridge, 1974; Timothy & Boyd, 2014). These issues can be exacerbated by social trails, which are unofficial paths formed by users taking detours off the designated trail area (US National Parks Service, 2023). Social trails can trample vegetation and accelerate erosion (US National Parks Service, 2023). Humans can be harmed using social trails by encountering uneven ground, damaged trees, or pests like ticks and mosquitos (US National Parks Service, 2023). When managed successfully, a trail will rank positively regarding quality, connectivity, visitor experience, resource protection, agency cooperation, sustainability, and community engagement (Maricopa County Parks and Recreation Department, 2018).

Timothy and Boyd (2014) highlight two management approaches to mitigate the adverse ecological effects of trail use. First are supply and demand approaches to regulate access, visitation, equipment, and behaviour (Timothy & Boyd, 2014). Second are visitor management approaches like enforcement and education. These frameworks view users/visitors as valued stakeholders who are imperative to trail management. These policy-based management techniques involve establishing a carrying capacity while using collaboration between stakeholder groups to manage the area (Timothy & Boyd, 2014). In this instance, carrying capacity describes the maximum level of use an area can endure before a decline occurs (Maricopa County Parks and Recreation Department, 2018). Timothy and Boyd (2014) examine the *Procedure for Operationalizing Limits for the Administration of Rivers (POLAR)* model. The first step is policy identification, which involves identifying the goals of the system, constraints on the system, and compatible activities (Butler et al., 1996; Timothy & Boyd, 2014). The second step is site-specific objectives, where the ecosystem's goals, constraints on the ecosystem, scarcity, and alternatives are all identified and considered (Butler et al., 1996; Timothy & Boyd, 2014). Undertaking these two steps should help establish the system's carrying capacity. Once this capacity is established, a monitoring system can be implemented to ensure the thresholds are not passed (Timothy & Boyd, 2014; Maricopa County Parks and Recreation Department, 2018). Monitoring is the third step of the POLAR model (Butler et al., 1996; Timothy & Boyd, 2014). This system can be applied to trail management techniques to help preserve trail ecosystems.

Other trail management guides have been established by various organizations and governments around North America (Maricopa County Parks and Recreation Department, 2018; Manitoba Natural Resources and Northern Development, 2023). Maricopa County Parks and Recreation Department (MCPR) developed a comprehensive guide for managing trails within their municipality (MCPR, 2018). Maricopa County is in southern Arizona and includes the central city of Phoenix. The MCPR provides guidelines for planning, design, maintenance, and signage (MCPR, 2018). The department provides an in-depth manual following the best practices for trail planning, construction, and maintenance (MCPR,

2018). Manitoba Natural Resources and Northern Development (MNRND) provided a trail strategy and action plan in 2023 (MNRND, 2023). This plan provides guidance on developing, expanding, and managing Manitoba trails (MNRND, 2023). The plan focuses on four pillars: partnerships, development, sustainability, and tourism while providing specific goals and actions showcasing how the province intends to fulfill these pillars (MNRND, 2023).

The process of trail management requires stakeholder collaboration (Timothy & Boyd, 2014; MCPR, 2018; MNRND, 2023). Given the wide-ranging conditions and influences surrounding trails, collaboration and partnerships in trail management systems are necessary (Timothy & Boyd, 2014; MCPR, 2018; MNRND, 2023). This collaboration creates a situation where “decisions and actions are collective, instead of individual” (Timothy & Boyd, 2014, p. 243). This collectiveness enables the representation of many viewpoints to help build a system that works for all. Furthermore, it ensures that all factors are considered when making management decisions. Good trail management paves the way for a successful system that enhances the benefits of trails. It is necessary to explore these benefits in more depth to determine if the Harte Trail possesses these characteristics, enabling the community to reap them.

### ***Benefits of protected areas***

Parks and protected areas such as the Harte Trail are public spaces operated, or jointly operated, by the *City of Winnipeg*, primarily used as spaces for outdoor recreation (Parks By-law, 2009). As previously stated, one reason for creating these protected areas is to minimize “risks of harms to the environment generally” (Parks By-law, 2009, p. 2). One way to minimize these impacts is by inspiring people to connect with nature (Boyce et al., 2007; Dickinson, 2016; Wright & Hill, 2021). The Harte Trail provides a platform where people can see the coevolution of society and nature while participating in outdoor recreation. This vision may help establish a worldview rooted in principles of ecocentrism that presents nature as an equal partner with humanity.

*Ecocentrism* is an ethical perspective that places value on the environment and recognizes the interconnectedness of ecosystems and all living things (Næss, 1990; Müller, 2017; Brennan & Lo, 2021). Ecocentrist worldviews encompass a deep sense of ecological connection, recognize the need to protect the environment, and foster a greater sense of sustainability in society (Müller, 2017; Brennan & Lo, 2021). The ecocentric worldview contrasts anthropocentrism, a human-centred viewpoint that places the fate, wellbeing, and convenience of human life and activities above all else (Boyce et al., 2007; Boddice, 2011). Anthropocentrism is generally based on the assumption that humans are separate from and superior to the natural world. This worldview is harmful and contributes to significant environmental degradation (Cronon, 1996; Boyden, 2016; Wright & Hill, 2021). Scholars have recently aimed to combat the human-nature divide by encouraging behavioural change to promote a more sustainable and ecocentric society (Boyce et al., 2007; Dickinson, 2016; Wright & Hill, 2021). Encouraging people to spend time in nature is crucial for promoting ecocentrism. It helps build the thought that humans are a part of nature instead of independent from it (Boyce et al., 2007).

Nature-based recreation is participating in leisure activities within natural environments (Rosa et al., 2019). Participating in nature-based recreation has many benefits. For example, research has linked nature-based recreation with an increase in feelings of positive mental health (Keniger et al., 2013; Van den Bosch & Bird, 2018). Lackey and associates (2021) evaluated 51 studies concerning the link between mental health benefits and recreation (Lackey et al., 2021). They found that of these studies, over 90% reported at least one positive mental health benefit associated with partaking in nature-based recreation (Lackey et al., 2021). Rosa and associates (2019) studied the relationship between nature-based recreation in childhood and its effects later in life. They found a significant connection between nature-based recreation and a connection to nature (Rose et al., 2019). Providing accessible areas for nature-based recreation can increase benefits and, perhaps, even enable some to question anthropocentric perspectives (Cronon, 1996; Boyden, 2016; Wright & Hill, 2021).

## ***Environmental education***

Education is recognized by the UNESCO (2023) as a fundamental human right that aids social justice and equality (UNESCO, 2023). Education helps develop critical thinking, decision-making, and problem-solving skills by teaching people essential information and encouraging them to function in socially beneficial ways (Trevors, 2007; Park & Kao, 2018). Environmental education arose in the 1970s as a response to humanity's environmental crisis (Swan, 1971; Weis, 1990; Palmer-Cooper, 1998). Instead of focusing solely on science, policies, and thresholds, environmental education aims to establish a foundation that may inspire long-term solutions to environmental problems (Swan, 1971; Weis, 1990). James Swan (1971) was one of the first to write extensively about environmental education based on a study conducted at the University of Michigan (Swan, 1971). Swan established that environmental education aims to produce citizens who are *knowledgeable* about the environment and its problems, *aware* of how to address them, and *motivated* to help work toward a solution (Swan, 1971; Cole, 2007). Swan (1971) further provides four main objectives that environmental education should help foster in individuals. Broadly, these objectives are that humans are an inseparable part of natural systems and possess the ability to alter them, understand the environment and its role in society, understand environmental issues and potential solutions, and develop a concern for the environment to help motivate action (Swan, 1971). These objectives articulated by Swan (1971) were considered by other organizations and, by the late 1970s, had begun to make their way into curriculums worldwide (Palmer-Cooper, 1998). The core principles established by early environmental education scholars mesh well with sustainability (Ardoin et al., 2018). This synchronicity is seen through UN sustainable development goal (UN SDG) number 4, *quality education*, which deems education necessary to generate meaningful sustainable development (United Nations, 2015).

As support continues to build for environmental education, various pieces of legislation are in place globally to help support the concept and bring it to fruition (Weis, 1990; Palmer-Cooper, 1998; Bootrach et al., 2015). In 1990, the USA implemented the *Environmental Education Act*, which aimed to

support institutions and non-profits nationwide in establishing programs to foster critical principles of environmental education (Weis, 1990; Potter, 2010). Various other jurisdictions have followed suit, and studies have been conducted to help establish what effective environmental education may entail (Palmer-Cooper, 1998; Chapman, 2014; Bootrach et al., 2015). The work of Chapman (2014) and Bootrach and associates (2015) evaluate the practical application of environmental education in the United States and Thailand, respectively (Chapman, 2014; Bootrach et al., 2015). Chapman (2014) provides ten recommendations based on a survey conducted with schools. These recommendations exist in organization, leadership, resource efficiency, facilities, healthy operations, nutritious food, curricula, extracurricular programs, students, and partnerships (Chapman, 2014). Bootrach and associates (2015) evaluated the relationship between the leadership characteristics of school administrators and teachers that affect environmental education strategies. They found that well-developed environmental education strategies are essential for instilling the principles of environmental education in students, which helps inspire environmental conservation (Bootrach et al., 2015).

Despite the international commitment, Canada lacks any national framework for using and implementing environmental education (Environment and Climate Change Canada, 2024). In the spring of 2024, Environment and Climate Change Canada published a discussion paper highlighting the country's key issues, opportunities and challenges associated with environmental education (Environment and Climate Change Canada, 2024). The document noted that 35% of educators in Canada report not covering environmental education, while 41% report only spending 1-10 hours per semester on the subject (Environment and Climate Change Canada, 2024). Instead, Canada's current state of environmental learning is primarily conducted informally through non-profit organizations (Environment and Climate Change Canada, 2024). In recent years, informal environmental education initiatives such as nature-based and experiential learning have gained traction in North America (Ardoin et al., 2018). These informal educational experiences occur outside of a traditional classroom setting, and instead, they immerse pupils in nature to teach them about the environment. Ardoin and associates (2018)

systematically evaluated environmental education outcomes in school programs (Ardoin et al., 2018). They found that, generally, environmental education produces beneficial outcomes while noting that it is location-specific (Ardoin et al., 2018). This finding means that unique outcomes will result from various forms of environmental education depending on the method used.

While Ardoin and associates (2018) suggest that environmental education is beneficial, that does not mean the concept is entirely free from criticism (Cole, 2007; Ardoin et al., 2018). Cole (2007) examines some shortcomings of environmental education and makes the case for increasing its scope. As Cole (2007) argues, environmental education is often confined to being an addition to science curriculums, and pertinent social issues are frequently excluded from the discussion. This criticism is also noted in the 2024 Environment and Climate Change Canada discussion paper (Environment and Climate Change Canada, 2024). Cole (2007) suggests that including social issues should help improve environmental literacy among students. Generally, environmental literacy is seen as the ability to be aware of natural systems and the linkages between society and environmental change (Cole, 2007).

Moving forward, Cole contemplates using place-based learning to promote student engagement and contribute to society's wellbeing (Cole, 2007; Gruenewald, 2008). Ideally, this will help foster a meaningful connection between learners and their community, improving sustainability (Boyd, 2019). Spending time in a local outdoor setting, such as the Harte Trail, is a form of place-based learning that may work to produce environmental literacy in students. Practicing environmental education may help promote more sustainable behaviours like active transportation. Trails are a valuable tool that can be used to encourage participation in active transportation.

### ***Active transportation corridors***

Active transportation corridors involve physical activity from self-propelled human-powered transportation while commuting from one location to another (Schofield et al., 2005; Berrigan et al., 2006; Whitfield et al., 2015). Active transportation corridors are key components of healthy lifestyles.

Many adults and children struggle to meet daily doctor-recommended physical activity thresholds (Schofield et al., 2005; Berrigan et al., 2006; Whitfield et al., 2015). This trend is particularly true in Canada, where Statistics Canada (2019) estimates that 40% of children and only 16% of adults meet the targets for physical activity (Statistics Canada, 2019). Promoting active transportation corridors is an excellent way to help combat health issues and lessen the social burden on healthcare systems (Berrigan et al., 2006; Whitfield et al., 2015). Promoting active transportation corridors also helps meet UN SDGs, most notably goal three, *good health and wellbeing*, and goal eleven, *sustainable cities and communities* (United Nations, 2015).

Many factors contribute to an individual's willingness and ability to participate in active transportation. Most notably, security, age, gender, income level, education, ethnicity, and geographic location will affect the degree to which people partake in active transportation (Schofield et al., 2005; Berrigan et al., 2006; Whitfield et al., 2015). Security is an issue that affects the willingness of people to participate in active transportation (Hagel et al., 2019; West Broadway Community Organization, 2021). For example, the West Broadway Community Organization (WBCO) is a non-profit group working in downtown Winnipeg. A portion of their five-year community plan focuses on improving active transportation throughout the neighbourhood. They aim to improve active transportation options primarily by focusing on maintenance, infrastructure, connectivity, and safety (WBCO, 2021). One idea identified in this plan is to support regular safety, mobility, and active transportation audits (WBCO, 2021). Hagel and associates (2019) evaluate how infrastructure changes affect the safety levels of youth in Canada who use active transportation (Hagel et al., 2019). They state that, on average, roughly 2400 child pedestrians and 1800 child cyclists are injured in Canada annually. They then evaluate how changes to infrastructure, such as bike lanes, crosswalks, or traffic-calming measures, may reduce these numbers (Hagel et al., 2019). If safety and security levels are improved, adults and youth alike will be more willing to participate in active transportation in Canada (Hagel et al., 2019; WBCO, 2021). Other variables affect participation rates of active transport in Canada and globally.

Berrigan and associates (2006) studied demographics concerning active transportation in California. They determined that education and income levels play a significant role in people participating in active transportation while noting that specific demographics generally participate in a lesser amount of active transportation (Berrigan et al., 2006). Whitfield and associates (2015) evaluated the prevalence or amount of active transportation generally undertaken by residents of the United States (Whitfield et al., 2015). Their study found that roughly 23.9% of respondents use active transportation in a habitual capacity, and 10.5% use active transportation in some capacity daily. In comparison, only 2.6% used it as a primary commute method (Whitfield et al., 2015). Schofield and associates (2005) studied active transportation trends among youth groups in Australia (Schofield et al., 2005). They had similar findings to the Whitfield (2015) study, stating that 10.4% of youth partook in active transportation during any given day (Schofield et al., 2005). The study also acknowledges that geographic location, age, and gender were significant variables affecting one's ability to participate in active transport. (Schofield et al., 2005). These generalized findings support the notion that rates of active transportation in the USA, Canada, and Australia are similar and primarily affected by issues related to safety and demographic variables. In order to improve these rates, it is necessary to evaluate specific issues facing active transportation rates in each area. Whitfield and associates (2015) state that obtaining local-level data is critical to help benefit active transportation rates in an area (Whitfield et al., 2015). The West Broadway Community Organization in Winnipeg is an excellent example of tackling these large-scale issues by offering solutions on a small-scale, local level. Evaluating active transportation trends and issues on the Harte Trail may enable decision-makers to determine specific plans to strengthen the trail's system and increase social benefits related to its use. Knowing that demographics are a driving factor of active transportation participation, it may be helpful to evaluate the trail and offer changes to the system to improve these trends.

All reviewed studies indicate that while active transportation is a good tool for promoting physical activity, it is not being utilized as effectively as it otherwise could be (Schofield et al., 2005;

Berrigan et al., 2006; Whitfield et al., 2015; Hagel et al., 2019). Schofield (2005), Berrigan (2006), and Whitfield (2015) provide several recommendations to promote active transportation moving forward. Policy interventions, such as changes to building infrastructure, aiding public safety measures, and establishing local educational initiatives, are critical tools for encouraging active transportation in the long-term future (Schofield et al., 2005; Whitfield et al., 2015; Hagel et al., 2019). Ensuring that variables such as placement of schools and user safety on public transportation networks are considered by decision-makers will aid in developing successful active transportation systems (Schofield et al., 2005). Additionally, both Berrigan (2006) and Whitfield (2015) specifically note that changes to the urban environment may increase the ease of participating in active transportation (Berrigan et al., 2006; Whitfield et al., 2015). These changes would involve modifying infrastructure already created by humans, such as creating bike paths and sidewalks while ensuring that active transportation corridors are well connected (Whitfield et al., 2015). An area such as the Harte Trail is helpful as a tool to promote sustainable actions such as active transportation. Given its uniquely situated location, it may also help curb troubling trends related to biodiversity loss.

### ***Biodiversity***

Preserving biodiversity, such as plants, animals, and ecosystems, is a primary goal of sustainability (Bishop, 1993; Niklasson et al., 2006; Briggs, 2022). Preserving biodiversity also works to meet various *UN SDGs*, notably goal fourteen, *life below water*, and goal fifteen, *life on land* (United Nations, 2015; Briggs, 2022). Biodiversity is socially, ecologically, and economically crucial (Bishop, 1993; Niklasson et al., 2006; Briggs, 2022). Biodiversity is often culturally or spiritually significant to many different groups of people and communities (Niklasson et al., 2006; Fisher et al., 2021).

Despite the harms associated with biodiversity loss, trade-offs exist with developing the urban environment for human use. The urban environment is a placemaking process; it comprises areas humans manipulate for human use. Exploring various ways to mitigate biodiversity loss to create sustainable

systems within the urban environment is pertinent. Bishop (1993) is a foundational scholar in searching for solutions to mitigate biodiversity loss through an economic lens. Bishop (1993) evaluates how biodiversity loss risks the economy by showcasing how extinction may result in the loss of economically significant species (Bishop, 1993). Bishop (1993) proposes using a ‘safe minimum standard’ concerning the biodiversity of an ecosystem (Bishop, 1993). The safe minimum standard utilizes the concept of trade-offs, noting that it is sometimes necessary to sacrifice portions of biodiversity to obtain a net economic gain (Bishop, 1993). The concept of trade-offs has remained a significant theme within development and preservation paradigms since this discussion (McShane et al., 2011; Santangeli et al., 2016; Fastré et al., 2020). A distinction exists between differing levels of costs, noting that both benefits and drawbacks exist to conserving an area (Bishop, 1993; McShane et al., 2011; Fastré et al., 2020). It is necessary for decision-makers to consider what level of trade-offs are acceptable when developing any area for human use (McShane et al., 2011; Santangeli et al., 2016; Fastré et al., 2020). Ensuring policies exist to preserve biodiversity and enable ecosystems to operate at a functional threshold helps create sustainability. As stated above, protected areas like the Harte Trail carry many social benefits. Reducing a small amount of naturalized habitat can be seen as an ecological trade-off to help promote a more sustainable society. By following conservation practices, the Harte Trail can work to preserve biodiversity while providing benefits to the urban environment.

Biodiversity conservation from a social perspective utilizes the strengths of stakeholder groups to develop inclusive systems capable of promoting environmental justice (Kopnina & Washington, 2020). Fisher and associates’ (2021) study makes a strong case for using social conservation practices using traditional knowledge and Western science to encourage conservation (Fisher et al., 2021). It is crucial to preserve biodiversity to ensure systems are operating sustainably. The Harte Trail can be seen as an example of stakeholder groups working together to preserve biodiversity. Organizations such as Friends of the Harte Trail, Trails Manitoba, the City of Winnipeg, and others have collectively created a protected area that promotes sustainability and biodiversity conservation in an urban environment.

As acknowledged above, biodiversity is an essential aspect of the Harte Trail. It is a significant display of a prairie ecosystem in an urban setting. The adjacent area harbours many native trees, shrubs, and grass species. Many animal species also call the area home, such as foxes, coyotes, rabbits, rodents, and dozens of bird species (Qualico Communities, 2024; eBird, 2025). In 2022, the City of Winnipeg approved a strategic development plan known as *OurWinnipeg 2045* (City of Winnipeg, 2022). This plan includes many different objectives and policy statements but prioritizes implementing sustainability principles into the organization's strategic direction (City of Winnipeg, 2022). The plan provides six localized goals for Winnipeg derived from the 17 UN SDGs (City of Winnipeg, 2022). These goals are leadership and good governance, environmental resilience, economic prosperity, good health and wellbeing, social equity, and city building (City of Winnipeg, 2022). Decision-makers within the City of Winnipeg organization aim to implement policies pertaining to these six broad goals to create a more sustainable Winnipeg (City of Winnipeg, 2022). The Harte Trail is an ideal location to implement, practice, display, and measure the success of these newly implemented goals. Using methods to promote biodiversity conservation in the area may help the City of Winnipeg meet its six strategic goals and create a more sustainable and equitable society for local constituents. Given the potential that the Harte Trail has to help improve various domains within sustainability, it is necessary to explore sustainability, which is the basis for the case study.

### ***Sustainability***

The broadest definition of sustainability arose from the 1987 Brundtland Commission, which was classified as meeting “the needs of the present without compromising the ability of future generations to meet their own needs” (Brundtland Commission, 1987, p. 16). While this is generally still the most accepted definition of sustainability, the term has rapidly advanced in the past several decades. The United Nations' 17 sustainable development goals attempt to provide higher standards of living across the globe while staying within the confines of planetary boundaries (United Nations, 2015; Schandl &

Walker, 2017). The modern discourse on sustainability has evolved well beyond the notion of minimizing resource consumption. It has developed into the field of *sustainability science*, an interdisciplinary approach which aims to tackle the complexities and issues surrounding humanity's relationship with the environment (Potvin & Richards, 2015; Sala et al., 2015). By focusing on strengths and vulnerabilities in social and natural systems, sustainability science studies interconnections and attempts to understand the system's broad outcomes (Schandl & Walker, 2017). The Harte Trail is an excellent example of the intersection of social and natural systems on a small local scale. Therefore, assessing the trail through the lens of sustainability science helps evaluate how the trail, neighbourhood, and municipality align themselves with the field.

The concept of being regenerative is relatively new in the field of sustainability. While grounded in sustainability, *regenerative* sustainability is based on the idea that humans should act as co-evolutionary partners with nature (Lyle, 1994; Robinson & Cole, 2015; Mang & Haggard, 2016). It goes past simply eliminating harm by promoting a net-positive approach using a multidisciplinary background to encourage continuous improvement (Dale, 2023). Regenerative development is encompassed by regenerative sustainability; it pursues the partnership between humans and nature by enabling systems to express their potential diversity, complexity, and creativity (Mang & Haggard, 2016). *Regenerative practices* enable change to improve something (Lyle, 1994; Mang & Haggard, 2016). These practices use systems thinking to redesign something sustainably (Lyle, 1994; Robinson & Cole, 2015; Mang & Haggard, 2016). *Regenerative practices* are tools that can be used to create regenerative sustainability. Regenerative practices attempt to change human thoughts and activities to generate a better reality. By utilizing collaboration, sustainable ideas can be built into policies to ensure that systems adequately meet their purposes for everyone involved.

Regenerative thinking challenges the status quo. Instead of a one-sided relationship with the environment, being regenerative involves reciprocity. Reciprocity is an obligation to remit the welfare gained through an action (Adams & Miller, 2022). Based on reciprocity, regenerative thinking aims to

create mutually beneficial relationships between the natural world and human systems (Robinson & Cole, 2015; Camrass, 2020). The idea moves past taking several steps to achieve sustainability through harm reduction. Instead, being regenerative focuses on maintaining a high level of sustainability to produce environmentally beneficial outcomes by doing more than the bare minimum. Regenerative systems are adaptable; they can change in the presence of new information (Camrass, 2020). Regenerative design focuses on locally specific solutions, utilizing and incorporating unique aspects and interactions of each system to create a desirable future (Craft et al., 2017; Camrass, 2020). Camrass (2020) reviews concepts in the regenerative domain and concludes their paper by advocating for a *regenerative futures* model. Future thinking involves changing how humanity thinks and plans to take practical steps to achieve a desired outcome (Bussey, 2014; Camrass, 2020). Camrass (2020) discusses how the fusion of regenerative and futures thinking can inform each other to create positive transformative pathways toward sustainability. By including the narrative of a place in a discussion of sustainability, it is possible to understand assumptions that lead a system to operate in a particular manner (Camrass, 2020). This information can help guide future decisions to help implement regenerative practices.

A sustainability *assessment* is a multidisciplinary appraisal methodology that evaluates the economic, environmental, social, cultural, and value-based elements of a system or area to support decision-making (Sala et al., 2015). Sustainability assessments provide unique ontological, epistemological, and methodological considerations throughout a study. Ontology describes what researchers believe is fundamental or essential (Marilyn, 1998; Berryman, 2019). In the case of sustainability assessments, Sala and associates (2015) call for a clear definition of boundaries and thresholds for sustainability within the assessment. This definition can help determine what sustainability looks like in the context of a particular assessment. Systemic boundaries refer to the scope of the assessment and should consider issues within the system, such as social, environmental, and economic impacts which affect the process being studied. Threshold limits establish indicators that, once exceeded, will cause adverse effects on the system (Taelman et al., 2020). Epistemology describes the researcher's

ways of knowing or how something comes to be known (Berryman, 2019). Given the value-based and cultural elements of sustainability, a sustainability assessment calls for the contribution and involvement of all stakeholders throughout the process (Sala et al., 2015). This involvement promotes shared knowledge between interested parties within the assessment (Sala et al., 2015; Berryman, 2019). The methodology of an assessment describes how a research inquiry should proceed (Freebody, 2003; Berryman, 2019). This approach also evaluates the interaction and feedback of socioeconomic systems and the environment through specific methodologies (Sala et al., 2015). Using the general framework provided by Sala and associates (2015), a sustainability assessment was conducted on the Harte Trail. Regenerative practices can be used to change management policies and procedures to help create a collaborative system that genuinely creates a sustainable Harte Trail for all stakeholders. In order to recommend these practices and tailor them specifically to the Harte Trail, it is necessary to collect information on how the system currently operates.

### ***Relevance to the study***

The literature reviewed in this chapter aims to provide an idea of the research surrounding links between various concepts existing in protected area management and sustainability. Each of the areas reviewed in this chapter forms the basis for the sustainability assessment conducted on the *Harte Trail*. Proper management helps create an area where sustainability can thrive. It is useful to evaluate whether the Harte Trail is helping the community develop a connection with nature, which can be a source of many social benefits. Assessing sustainable concepts like environmental education, active transportation, and biodiversity conservation helps highlight the strengths and weaknesses of the Harte Trail's management system. Recognizing these factors creates an opportunity to apply regenerative sustainability. Regenerative sustainability utilizes regenerative practices to transform system outputs and promote net positive outcomes.

## Methodology and Methods

A qualitative methodology using the generalized framework of a sustainability assessment is used for this study. As previously discussed, a sustainability assessment is a multidisciplinary appraisal methodology that evaluates the economic, environmental, social, cultural, and value-based elements of a system or area to support decision-making (Sala et al., 2015). A qualitative approach is described as a research process “highly reliant on observations that are not quantified” (O’Leary, 2017, p. 142). Qualitative methods are descriptive; they seek opinions or behavioural trends (Taylor et al., 2016). Taylor and associates (2016) suggest that qualitative research is concerned with understanding reality from the point of view of individuals. Nije and Asimiran (2014) state that qualitative methodology is necessary to understand unique and complex situations that cannot be described using simple calculations. O’Leary (2017) further comments on how a qualitative approach can provide deeper insights into complex social norms and interactions (O’Leary, 2017). According to O’Leary (2017), the primary goal of qualitative approaches is to “gain an intimate understanding of people, places, cultures, and situations through rich engagement and immersion in the reality being studied.” (p. 142). Qualitative research methods are a valuable tool for studying how groups of people perceive things in their everyday lives (Nije & Asimiran, 2014; Taylor et al., 2016; O’Leary, 2017). These descriptions closely follow the goals of the Harte Trail sustainability assessment.

Nije and Asimiran (2014) describe how a qualitative methodology can be advantageous when conducting case studies. They note how qualitative methodologies and case studies focus on the in-depth characteristics of an entity by evaluating real-life situations using multiple data sources (Nije & Asimiran, 2014; O’Leary, 2017). Broadly, a case study can be described as a unit of study which comprehensively researches a single area or case in a particular situation (Nije & Asimiran, 2014; O’Leary, 2017). This study uses a qualitative case study approach that aligns with the characteristics of a sustainability assessment. O’Leary (2017) states that a case must be defined by identifiable boundaries (Nije & Asimiran, 2014; O’Leary, 2017). In this instance, an urban multi-use trail with clear boundaries, and

where several elements of sustainability intersect. Sustainability assessments can benefit from this approach as they require holistic and interconnected ideas which consider diverse views, location specific challenges, and complexity (Pope et al., 2004; Sala et al., 2015). O’Leary (2017) discusses the notion that case studies possess several characteristics which make them particularly useful in the context of certain situations (Nije & Asimiran, 2014; O’Leary, 2017). In the context of the Harte Trail, the case study can be seen as possessing intrinsic value and bringing new variables to light. These attributes imply that the case is socially relevant to a particular community, while also being exploratory with the goal of identifying new understandings or issues (O’Leary, 2017). Given this information, a qualitative case study approach is ideal for a sustainability assessment on a critical urban community space such as the Harte Trail.

### ***Data collection***

Data were collected from interviews with key informants and members of the public familiar with the Harte Trail. Participants’ observations and perspectives are the basis of recommendations for improving the trail.

To best address the knowledge gap surrounding urban Winnipeg trails, it is first necessary to thoroughly analyze a current model like the Harte Trail - to help identify several strengths and weaknesses that regenerative practices could work to enhance. This analysis was accomplished by first using an exploratory approach to identify strengths and weaknesses in the current Harte Trail system. Exploratory research is discussed in great detail in a 2001 book by Robert Stebbins. Stebbins (2001) defines exploratory research as a “broad-ranging, purposive, systematic, prearranged undertaking designed to maximize the discovery of generalizations leading to description and understanding of an area of life” (p. 3). In this instance, it is necessary to conduct exploratory research because little qualitative literature exists specific to urban trails in Winnipeg. The existing research seems to evaluate human health benefits associated with urban trails in Winnipeg using a quantitative methodology (McGavock et al., 2022). For a comprehensive understanding of urban trails in Winnipeg, information must be drawn from other means,

such as critical stakeholders like the public, community groups, and government. The information obtained from these stakeholders offers an understanding of the current situation on the Harte Trail. The data obtained from this study create a comprehensive understanding of the Harte Trail. They may also contribute to a more generalized understanding of urban trails in Winnipeg by determining how one is managed and how improvements in management could benefit sustainability.

It is important to note that the data collection in this study was approved by an ethical review board prior to commencing. The *Office of Research Ethics at Royal Roads University* undertook the review and provided guidance and final ethical approval. Formal ethical approval for the project was received on January 10, 2022. After extensively detailing the project through a twenty-four-section form, an accredited office member provided feedback to aid the data collection process. After minor revisions, the project's methodology was approved before commencement and the data compilation period. This process helps ensure that the research is undertaken ethically and follows best practices.

### ***Researcher disclosure***

The researcher grew up in Winnipeg and has lived in the community for twenty-six years. Working as an Arborist, they have always loved the outdoors, nature, and recreation. The researcher has seen many instances of development and urban sprawl leading to ecological destruction. Undeniably, they advocate for conservation and ecological restoration whenever the opportunity arises. The Harte Trail is an excellent example of an area local to the researcher threatened by development. Conducting this study is an attempt to showcase the value of urban conservation while simultaneously working to improve a valuable recreational area. In this light, ensuring that the data analysis is credible is necessary. The method of Srivastava and Hopwood (2009) is utilized to ensure that the inherent bias of the researcher is accounted for throughout the study. This method is discussed in greater detail in the data analysis section of the study.

### ***Public engagement survey***

The first qualitative method employed by this study was an internet-based survey. Braun and associates (2021) evaluate how qualitative surveys are valuable tools for gathering a nuanced, comprehensive, and unique understanding of social issues (Braun et al., 2021). One significant advantage of a qualitative survey is that they are flexible and address a wide range of phenomena related to the research topic (Braun et al., 2021). This flexibility is useful as it helps capture diverse perspectives pertaining to the research of under-explored areas (Braun et al., 2021). Qualitative surveys are self-administered and focus on providing open-ended questions to participants (Braun et al., 2021). They are provided to all in a fixed and standard order, enabling people to answer questions in their own words (Braun et al., 2021). This process helps capture the essence of things which are most important to survey participants.

The Harte Trail public engagement survey aimed to gain information on public perception, uses, and thoughts regarding the Harte Trail. The survey was conducted using the website *SurveyMonkey* with members of the adjacent Charleswood community, trail users, and other concerned Manitobans. Thirteen questions were posed about the trail as it currently exists. Convenience sampling was used due to the nature of the research. Convenience sampling is a “nonsystematic approach to recruiting respondents that often allows a potential respondent to self-select into the sample” (Schonlau et al., 2002, p. 33). Schonlau and colleagues (2002) state that the convenience sampling technique is helpful for internet-based surveys because it helps to identify issues surrounding the research subject and to develop recommendations. Qualitative research uses thematic exploration when considering data (O’Leary, 2017). Since this survey is qualitative, it is not meant to be statistically representative of the entire population. Therefore, this assessment does not have a well-defined sample size and response quota (Schonlau et al., 2002; Nije & Asimiran, 2014). The information obtained from this survey was used to identify user patterns and perceptions regarding the Harte Trail.

### ***Key informant interviews***

The second qualitative method utilized was key-informant interviews. These interviews were used to better understand the issues and management decisions surrounding the Harte Trail. In addition, purposive sampling (Tongco, 2007) was used to reach out to organizations with members possessing critical knowledge surrounding the research question. Purposive sampling is a non-random method of informant selection in which the researcher chooses informants based on their knowledge (Tongco, 2007). These interviews were conducted over the Zoom video chat interface.

Before the interview, each informant was provided a copy of the ten interview questions (See Appendix E). This provision gave them time to prepare and helped avoid unforeseen issues. All participants were asked the same questions. Following the interview, the data were transcribed and sent to the participant. They were provided the opportunity to edit their responses. After receiving consent, the data were entered into an anonymous data set. Responses were assigned a random letter and categorized into each applicable data set. Once these responses were entered, they became part of this research study. This process helped to ensure that each participant and their responses remained confidential throughout the study.

By coupling the survey data with the data provided by key informants, enough information was supplied to conduct a thematic analysis and answer the research question. Figure 2 below identifies the groups identified for the study. At least one member from each group was interviewed.

**Figure 2.**

*Key-Informants*

<b>Group</b>	<b>Reasoning</b>	<b>External Information</b>
Friends of the Harte Trail	Non-profit focused on planting trees and maintaining the 6.5 KM Harte Trail in Charleswood.	<a href="https://www.hartetrail.com/">https://www.hartetrail.com/</a>
Trails Manitoba	Provincial group aiming to promote and fund recreational trails throughout Manitoba to help improve the well-being of communities.	<a href="https://www.trailsmanitoba.ca/">https://www.trailsmanitoba.ca/</a>
City of Winnipeg: Parks and Open Spaces	Municipal government department responsible for maintaining parks and open spaces in Winnipeg.	<a href="https://legacy.winnipeg.ca/publicworks/parks/recreation-parks-strategies.stm">https://legacy.winnipeg.ca/publicworks/parks/recreation-parks-strategies.stm</a>
City of Winnipeg: Naturalist Services	A faction of the Winnipeg parks department that focuses on maintaining and managing ecologically significant natural areas in Winnipeg.	<a href="https://legacy.winnipeg.ca/publicworks/parksOpenSpace/NaturalistServices/default.stm">https://legacy.winnipeg.ca/publicworks/parksOpenSpace/NaturalistServices/default.stm</a>

The two portions of this study aimed to incorporate everyone with a vested interest in the Harte Trail. The public engagement survey incorporates the public and recognizes them as essential stakeholders. It provides a platform for a large group to provide insight into something they care about anonymously. It supplies data to help determine how the trail operates for typical daily users. Moreover, the key informant interviews aimed to incorporate experts with critical knowledge of how the Harte Trail system operates. They provide essential data on how the Harte Trail is managed and methods for potential improvement. Coupling these two sources of information creates a clear picture of the management and current state of the Harte Trail.

O’Leary (2017) states that 15 people are typically an appropriate number of key informants to draw results; however, this may not always be feasible. A 2021 study from Muellmann and associates (2021) measured whether using 4-6 key informants provided the same level of validity as 12-17 interviews. Conducting community readiness interviews in small geographical areas such as neighbourhoods, Muellmann et al. (2021) found no statistical differences in results from the small and

extended samples. This finding would suggest that, situationally, having less than 15 key informants may be acceptable, provided they can collectively provide an accurate picture of the research subject. Njie and Asimiran (2014) discuss the nature of a sample size for a qualitative case study (Nije & Asimiran, 2014). In this scenario, they discuss how a sample should represent the best and most in-depth information a researcher can obtain (Nije & Asimiran, 2014). Nije and Asimiran (2014) state that a case study must have a minimum of one interview but can have more based on the nature of the study. Six experts were interviewed as part of this study. This sample provided much data that pertained to this study's research objectives. The participants represent four distinct groups with high-interest levels regarding the Harte Trail. This sample size meets the necessary principles for qualitative case study interviews (Nije & Asimiran, 2014; O'Leary, 2017; Muellmann et al., 2021). Following the data collection period, an analytical approach was used to assess the data and draw results from it.

### ***Data analysis***

A qualitative data analysis approach is a systematic method to aid in analyzing qualitative data (Srivastava & Hopwood, 2009). Many approaches exist to assess qualitative data, but in this instance, the best method for the study is an inductive approach that leads the way into an iterative process. An inductive system will categorize a large amount of data into small groups, forming a multi-staged data classification process (Bartosh et al., 2021). When appropriately used, an inductive system will give rise to a repetitive process of analysis where each data set is assessed credibly. In this instance, each question the informants and survey participants are asked is classified as a dataset. These datasets were individually assessed to determine trends from the interviews and surveys.

Srivastava and Hopwood (2009) argue that reflexive iteration is at the heart of good qualitative data analysis (Srivastava & Hopwood, 2009). This sentiment implies that data should be analyzed repetitively to account for the researcher's presence in the process. Srivastava and Hopwood (2009)

provide a framework of three questions throughout the data analysis process to help breed credible results.

These three questions are stated as follows:

1. “What are the data telling me?;
2. What do I want to know (from the data)? and;
3. What is the dialectical (logical) relationship between the data and what I want to know?”

(Srivastava & Hopwood, 2009, p.78).

Srivastava and Hopwood (2009) state that the first two questions help them identify gaps in their understanding of the data and how to move forward. Applying the third question helps develop a series of working hypotheses (Srivastava & Hopwood, 2009). Using these approaches, researchers can refine or challenge the emerging relationships relevant to the research question. Each iteration of this process should assist in identifying new data themes or issues arising from the research (Srivastava & Hopwood, 2009).

Establishing the validity, accuracy, and integrity of the data requires clear techniques and a systematic analysis process. Implementing checks and balances helps to minimize potential researcher bias. The outlined data analysis approach can be utilized to address any credibility concerns which may arise. Six questions identified by Bartosh and associates are a valuable tool to aid a researcher in assessing the quality of their data (Bartosh et al., 2021). These six questions include the following.

1. “Is the data based on your own data collection or hearsay?
2. Is there corroboration by others of your observations?
3. In what circumstances was the data collected or reported?
4. How reliable are those providing the data?
5. What motivations might have influenced a participant’s response or report? and
6. What biases might have influenced how observations were made or reported?” (Bartosh et al., 2021, p. 46).

The collected data were analyzed using the above questions from the information gained during the Harte Trail sustainability assessment. The researcher created a guide incorporating these principles to determine trends within the data. Figure 3 below displays this guide. The exercise was conducted on each dataset three times, and the results are detailed in the following sections.

**Figure 3.**

*Data Analysis Guide*

<u>Analysis</u>	<u>Dataset x</u>	<u>Credibility</u>	<u>Dataset x</u>
<i>What are the data telling me?</i>		<i>Do others agree? Is there corroboration?</i>	
<i>What do I want to know?</i>		<i>Are there any external motivations?</i>	
<i>What is the relationship to the research?</i>		<i>Are any potential biases affecting this data?</i>	

*Note.* The researcher created this guide based on the principles of qualitative analysis discussed above. It is an inductive approach using iterative exercise to determine relationships in the data while assessing its credibility. Figure 3 is a blank display of this guide.

The established data analysis guide is a valuable and straightforward tool to help conceptualize the data and determine trends. It is important to note that it does operate on several assumptions relating to the credibility framework of Bartosh and colleagues (2021). Regarding the survey, it is impossible to determine the reliability of every anonymous respondent. This data is more helpful in determining current use patterns of the Harte Trail and how constituents currently view the system. The analysis of this data relies less on the individual and instead utilizes the collective responses of many to draw inferences. This data primarily meets research objectives one and two.

Regarding the key informant interviews, each respondent was recommended by an organization they are affiliated with, which all play a critical role in managing the Harte Trail. These organizations are assumed to have reliable members with fundamental knowledge about the Harte Trail. This data analysis

is much more helpful for research objective three, which considers regenerative practices that may help improve the trail's function. The data's nature is opinion-based, meaning no answer is wrong or illegitimate. All data were collected in the same circumstances, either through sit-down Zoom interviews or internet-based surveys. These assumptions, coupled with the data analysis guide, pave the way for credible data analysis based on the frameworks of Srivastava and Hopwood (2009) and Bartosh and associates (2021). The results from the interviews and survey are presented next.

## Results

### *Public engagement survey findings*

This section presents the public engagement survey results for the Harte Trail study. It summarizes the data collected from each question posed to respondents and provides insights into stakeholder perceptions of current trail management practices. The analysis aims to gather essential information on the strengths and weaknesses of the current system from the perspective of the typical trail user. Respondents were instructed to select ‘Yes’ or ‘No’ to questions and encouraged to elaborate on their answers through an independent comment section associated with each. Each dataset was then processed using a data analysis guide designed to help interpret the data and relate the information to the research question. The data analysis guide associated with each question can be found in *Appendix G*.

The survey ran from August 30 – September 29, 2022. It is thirteen questions in length and took roughly ten minutes to complete. One hundred nineteen people participated in the survey. Some respondents periodically skipped questions. It was intended to engage trail users regarding their perceptions of the Harte Trail. Questions were formulated based on the domains discussed in the above literature review. They are meant to gain a basic knowledge of how trail users view areas of the Harte Trail, which are essential to sustainability.

#### *Survey Question 1*

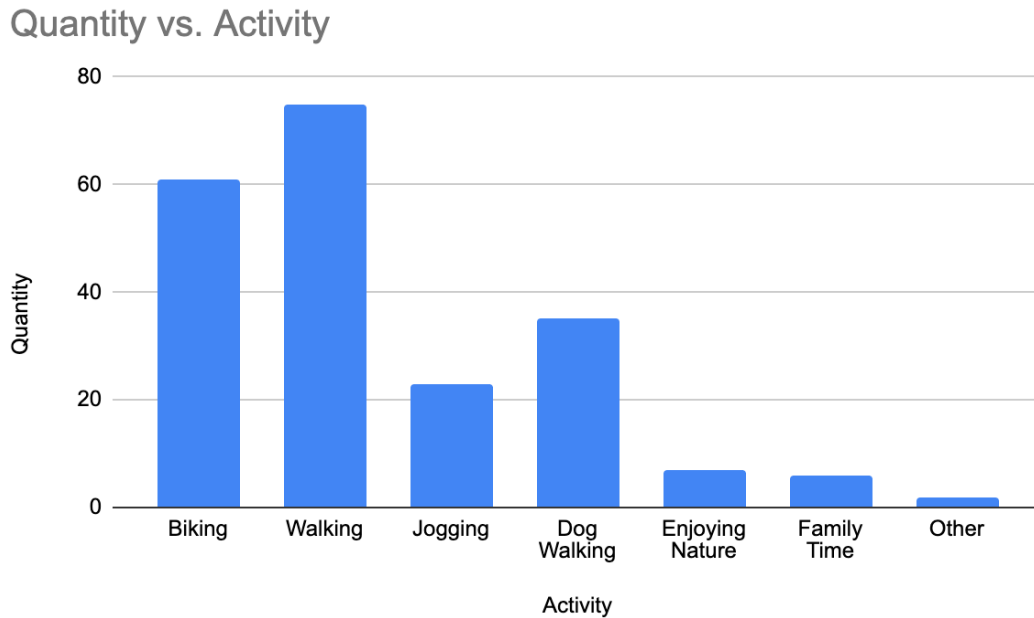
Question one, “Do you feel the Harte Trail is an essential feature of the adjacent neighbourhood?” received 117 yes votes, and 1 no vote. The question helps assess whether the Harte Trail is an important neighbourhood feature. The results suggest that the Harte Trail is perceived to be an integral part of the community, with over 99% of respondents agreeing with the question.

#### *Survey Question 2*

Question two, “What do you primarily use the Harte Trail for?” the results illustrate that walking and biking are the two prominent uses of the Harte Trail. This data indicates that the focus of the research survey's results will come primarily from these two user groups. ‘Figure 4’ below illustrates these results.

**Figure 4.**

*Survey Question 2 Results*



*Note.* The most common uses of the Harte Trail.

*Survey Question 3*

Question three, “Does the Harte Trail adequately meet the recreation and leisure needs of the area?” received 85 yes votes, and 34 no votes. The data shows that the Harte Trail generally meets recreational needs (i.e., twenty-seven people complimented trail maintenance); however, twenty-four respondents commented on conflicts between bicyclists and pedestrians on the path.

*Survey Question 4*

Question four, “Do you feel the culture of Winnipeg is represented along the Harte Trail?” received 70 yes votes and 43 no votes. The findings indicated that most people (62%) feel that they are adequately represented on the trail. Twenty-three people referenced the notion that the trail aids in community connection, while others mentioned that the area simultaneously works to preserve native ecology. Some people thought increasing cultural displays might jeopardize nature, while others noted

there needed to be more local art. These results showcase a mix of opinions regarding the Harte Trail and culture. Given the ambiguity of the term culture, these results are unsurprising.

#### *Survey Question 5*

Question five, “Do you feel safe using the Harte Trail?” received 68 yes votes, and 49 no votes. This question was concerned with the social aspect of trail management. The findings show that many people have mixed opinions regarding safety along the trail. Twenty-six people commented that they feel uneasy using the trail at night due to a lack of lighting. Twenty-five people noted having strange interactions with other people. Fourteen people referenced conflicts between cyclists and pedestrians, while eight cited interactions with coyotes or other wildlife. A typical observation throughout the data was that those walking and jogging have the most prominent safety concerns. Since several individuals identifying as women reported a general feeling of unease when using the trail after dark, gender does seem to affect how certain members of the public practice recreation on the trail.

#### *Survey Question 6*

Question six, “Do you feel there is enough enforcement of rules along the Harte Trail?” received 63 yes votes, and 56 no votes. This question focused on the management of the Harte Trail. It is intended to assess if the indirect management strategies, such as the existing signage, are effective at enforcing the rules along the Harte Trail. The data showcases a mix of opinions regarding the enforcement of rules. Twenty-five people mentioned dog owners breaking the rules, such as being off-leash or littering. Sixteen people mentioned cyclists breaking the rules. Ten people observed motorized vehicles on the trail. These results suggest that enforcement is a potential area of concern for the Harte Trail management system. However, it should be noted that some participants may have been motivated to answer ‘No’ to this question, hoping to see more municipal resources allotted to direct enforcement tactics.

#### *Survey Question 7*

Question seven, “Is the Harte Trail satisfactorily maintained through all seasons?” received 94 yes votes, and 25 no votes. This question concerned the management of the Harte Trail and was meant to

determine whether the current management system was appropriate for year-round use. Most (79%) of trail users feel the trail is satisfactorily maintained across the seasons. Eleven people noted how plant/weed maintenance could improve in the summer months, while a few were concerned with ice, drainage, and snow removal. The data suggests that year-round maintenance is a strength of the trail system.

#### *Survey Question 8*

Question eight, “Are enough waste disposal sites, such as garbage bins, recycling bins, and cigarette receptacles, present along the Harte Trail?” received 71 yes votes, and 46 no votes. These answers suggested that while the volume of waste disposal sites is sufficient, the organization and maintenance of these sites could be improved. Twenty-five people commented that there could be more receptacles. Four people commented that dog bag stations could be filled more frequently or that new dog bag stations should be located along the trail. Four people also thought that existing bins should be emptied more regularly. A small number of people referenced the lack of recycling bins and bathrooms. This data suggests that more could be done to promote proper waste disposal along the Harte Trail.

#### *Survey Question 9*

Question nine, “Do you believe the Harte Trail plays a role in combatting the ecological crisis?” received 100 yes votes, and 18 no votes. This question shifted the public engagement survey’s focus to the trail system’s perceived ecological values in this urban area. A vast majority of respondents (85%) believed that the trail plays a role in helping to combat the ecological crisis. No significant comments were left for this question.

#### *Survey Question 10*

Question ten, “Does the Harte Trail provide a good area for wildlife to live and perform activities?” received 111 yes votes, and 8 no votes. This question assessed the perceived ecological value of the Harte Trail. The data showcases that a substantial majority of people (93%) believe the trail provides adequate habitat for wildlife. These results showcase that many participants believe the current

state of the Harte Trail provides sufficient space for local wildlife to live. This notion is surprising, considering that much of the recent controversy surrounding the Harte Trail has been regarding the new development project that is perceived to reduce habitat along or near the trail.

#### *Survey Question 11*

Question eleven, “Are there enough replanting initiatives for local flora along the Harte Trail?” received 76 yes votes, and 43 no votes. This question pertained to the ongoing environmental management practices along the trail. Roughly 65% of respondents felt there was an adequate level of environmental management (i.e., replanting), while approximately 35% felt there was not. No comments were left for this section.

#### *Survey Question 12*

Question twelve, “Are invasive species adequately managed along the Harte Trail?” received 76 yes votes, and 37 no votes. This question was meant to explore if the current level of stewardship was sufficient. The data showcases mixed opinions on this issue. Twenty-five people were unaware of any practices specifically pertinent to invasive species management. Five people felt that there needed to be more management strategies addressing invasive species. Three people commented on the lack of resources to monitor this issue. Some comments directly criticized the municipal government. These results highlight the need to expand information regarding invasive species management in the area. Improving awareness may help identify and manage the issue better.

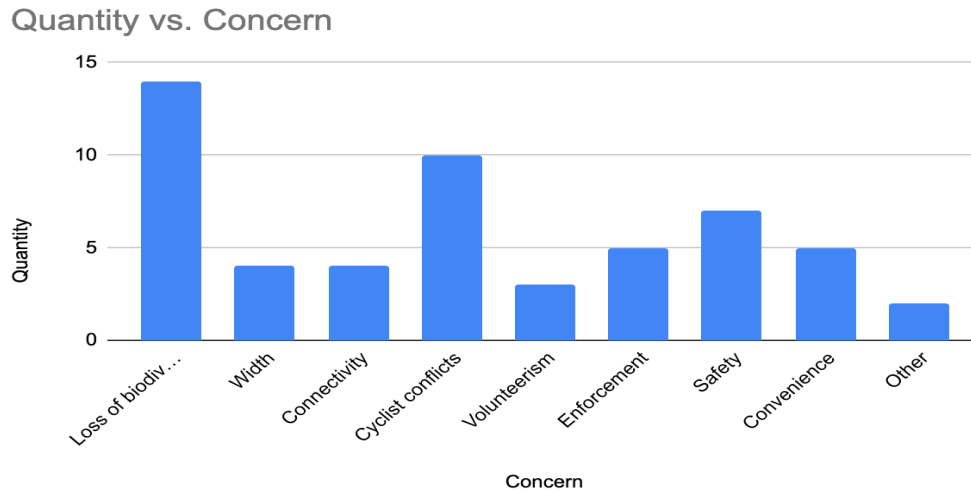
#### *Survey Question 13*

Question thirteen, “Do you have any other comments you would like to leave regarding any additional aspects of the Harte Trail?” this question attempted to identify critical management areas for the trail. Fourteen people commented on the perceived decreasing levels of biodiversity. Ten people were concerned with cyclist-pedestrian conflicts. Seven people were concerned with safety and advocated for more lights along the trail. Five people wanted the rules to be enforced, such as littering or using motorized vehicles. Five others wanted more conveniently placed amenities like benches, garbage cans,

or bathrooms. Four people stated that connectivity could improve, and four others would like to see the trail widened. ‘Figure 5’ below displays these concerns.

**Figure 5.**

*Survey Question 13 Results*



Note. The most common concerns of Harte Trail users.

### ***Survey summary***

The following three themes emerged from the survey. One, although the trail was generally perceived as providing habitat to wildlife, there are concerns with the perceived decline of biodiversity along the trail. Two, users did not always feel safe, especially at night, while using the Harte Trail. Additionally, conflicts between cyclists and pedestrians were a detractant to some users. The third critical theme is related to infrastructure or planning concerns. Infrastructure concerns such as trail width and connectivity to other trail corridors worsen the safety issue on the Harte Trail. These themes and how they relate to the key informant interviews are re-examined in the regenerative practices section later in the thesis.

### *Key informant interview findings*

This section details the key informant interviews regarding the Harte Trail. Interviews were conducted in the fall of 2022. Interviews ranged in length from roughly fifteen minutes to one hour. All interviews took place on Zoom. All respondents (six in total) were asked ten questions regarding the trail's management and its perceived social and ecological values (See Appendix E). These six individuals represent the core of what makes the Harte Trail work. They are members of the City of Winnipeg: Parks, City of Winnipeg: Naturalist Services, Friends of the Harte Trail, and Trails Manitoba. Each association has essential knowledge regarding how the trail is managed, funded, and used. Each interview transcript was analyzed using the same process as the survey (see Appendix H for further information). These insights provide a detailed analysis of how the Harte Trail is presently managed and how it could be in the future.

As stated earlier, each respondent remained anonymous in the datasets and throughout the data analysis process. This anonymity was accomplished by assigning each respondent a random letter and distributing the response to the applicable dataset. The datasets were placed in a file only accessible to the researcher.

The data below summarizes each interview question by comparing each participant's responses. This summary was done to identify any salient themes and conflicts and straightforwardly illustrate them. To protect anonymity, direct quotes from participants are avoided throughout this section. Instead, responses are paraphrased and summarized to demonstrate the data concisely.

#### *Interview Question 1*

The first question, "Do you think the Harte Trail is critical to the community? Why/why not?" examined the importance of the Harte Trail. The data provided by the interviewees confirmed that the trail is perceived to be an integral part of the community. Each respondent answered 'Yes' to this question. Three respondents cited connectivity to other corridors as the driving critical feature, while three others cited it as providing an easy way to connect with nature. Other comments pertained to the sense of

community and recreational opportunities it offers. Connectivity to different parts of the local community and spending time in nature were the most important factors identified in this question.

#### *Interview Question 2*

The second question, “In your opinion, does the Harte Trail do an adequate job of meeting the recreation and leisure needs of the area? Why or why not?” identified the recreational opportunities and barriers in the Harte Trail. Respondents generally agreed that it meets specific recreational needs for some people. The trail seems to fall short because it does not have accessible entry points to the northern parts of the community (i.e., North Charleswood) and lacks a safe connection between certain sections of the trail. Many interviewees described the lack of secure connection points while getting onto or exiting the Harte Trail as a significant barrier.

#### *Interview Question 3*

The third question, “Does the Harte Trail represent the culture of the area and community? Why or why not?” was meant to assess the socio-cultural and socio-ecological aspects of the Harte Trail system. Four respondents stated ‘Yes,’ one respondent said ‘Somewhat,’ and one stated ‘No.’ Two respondents specifically cited that it promotes nature. Two people also mentioned that it does a good job showcasing the history of the community, as the trail contains various plaques commemorating the former rail system. One respondent thought it could do a much better job showcasing local indigenous cultures or history in the area.

#### *Interview Question 4*

The fourth question, “In your opinion, does the Harte Trail promote active transportation in Winnipeg? Can this be improved? How?” assessed how the Harte Trail is used as a transportation corridor in Winnipeg. The data suggests that the Harte Trail is commonly used as an active transportation corridor; however, as some respondents suggested, there may be better-suited areas for this to occur. Two respondents specifically mentioned the lack of connection to other trail systems on the western edge as an issue. One respondent thought it was not the best idea to actively promote the trail as an active

transportation route due to the risk of exacerbating the problem of conflicts between cyclists and pedestrians. It was generally agreed that the Harte Trail is a safer space than road access for active transportation.

Additionally, a lack of connection on the western edge to the Headingley Grand Trunk Trail created a barrier for those living or commuting west of Winnipeg. Informants suggested creating a separate crossing across the western edge of the trail to connect these corridors. A complementary system explicitly dedicated to active transportation using existing road infrastructure on the adjacent residential streets was also suggested.

#### *Interview Question 5*

The fifth question, “In your opinion, does the management system around the Harte Trail preserve biodiversity in the area? If so, how?” focused on the perceived ecological values of the Harte Trail. The responses suggest that managing the Harte Trail for biodiversity is perceived to be sustainable. Respondents mentioned how replanting initiatives from locally grown trees and butterfly gardens have been implemented along the trail. The removal of weeds was also mentioned as a management method. Two respondents stated that the trail management system could collaborate better with stakeholder groups to identify critical protected areas and initiate collaborative management strategies. The lack of collaboration between decision-makers, property owners, and researchers hindered biodiversity preservation on the Harte Trail. Respondents provided suggestions for developing more effective communication strategies between these stakeholders.

#### *Interview Question 6*

The sixth question, “Are you aware of any environmental education opportunities for the Harte Trail? What are they? If not, why do you think this is the case?” focused on the role of the Harte Trail as a tool for environmental education. Some respondents noted that trail managers had historically undertaken environmental education initiatives. However, these initiatives must be more consistent, and the opportunity for more (or enhanced) initiatives should be developed. Three respondents were unaware of

any environmental education occurring past or present on the trail. Three respondents referenced the opportunity for partnerships with other organizations, while three more spoke of the potential for increased signage. Two respondents spoke positively of the ongoing tree-planting initiatives.

#### *Interview Question 7*

The seventh question, “In your opinion, is the Harte Trail adequately maintained? Have you noticed any maintenance issues? If so, what are they?” focused on the maintenance of the Harte Trail. All six respondents agreed that the Harte Trail is generally adequately maintained. Two responses stated that removing weeds and overhead vegetation could be improved. Two respondents mentioned the efficacy of snow removal and plowing strategies during the winter and the helpfulness of the green team (a summer student program) in the summer. Respondents noted that the Harte Trail seemed much better maintained than other trail systems in Winnipeg.

#### *Interview Question 8*

The eighth question, “Is there collaboration between stakeholders regarding the management of the Harte Trail? Do groups collectively make decisions? How do you think could this be improved?” pertained to decision-making processes regarding the management of the Harte Trail. All respondents agreed that there is some collaboration, but four noted that the current level of collaboration could be improved. Two respondents believed the current system to be sufficient for collaborating on decisions regarding the Harte Trail. Working with the community and other government levels has successfully implemented initiatives like tree planting and funding opportunities. Enhancing the opportunity for members of the public to voice their concerns through the development of a management plan and annual meetings, suggested by some members, could help improve the management of the trail.

#### *Interview Question 9*

The ninth question, “In your opinion, is there a sufficient level of monitoring on the Harte Trail?” focused on the perceived effectiveness of monitoring strategies on the Harte Trail. Three respondents believed the current level of monitoring to be sufficient. Others provided mixed opinions. Specifically,

two respondents referenced ongoing issues between cyclists and pedestrians, while one respondent spoke about secondary paths (also known as “social trails”) and the main trail.

#### *Interview Question 10*

The last question, “In your own words, what works about the Harte Trail, and what does not work?” was meant to obtain information on what the respondents believe are the strongest and weakest features of the Harte Trail system. Four respondents stated how the trail fosters a connection to nature. Two stated how it connects recreationists to other areas of Winnipeg, while three stated how it is incredibly well-maintained and provides an excellent place for community members to interact with one another.

Most respondents had different ideas about the most prevalent concerns facing the trail. Two agreed that the most significant issue is the lack of a safe connection across the perimeter highway. Others advocated for safer connections to parts of the trail system, addressing cyclist-pedestrian conflicts, stopping illegal dumping/littering, and facilitating community/volunteer involvement in trail management.

#### *Respondent interview summary*

These data identified the strengths and weaknesses of the Harte Trail. The following four themes were identified using observations from interested stakeholder groups. (i) the need for a management plan, (ii) increasing stakeholder collaboration, (iii) addressing safety concerns, and (iv) implementing new infrastructures along the trail. These four themes form the basis for regenerative management practices, which will be discussed next.

## **Discussion**

Each dataset presented in the previous sections focused on obtaining information about key management aspects of the Harte Trail. The public engagement survey was meant to gain insights from typical trail users and concerned citizens. The key informant interviews focused on the current state of the trail, evaluating strengths and weaknesses at an in-depth level and occasionally receiving input on regenerative strategies that may address some weaknesses and bolster the level of sustainability existing on the trail. The main takeaway was that, generally, the management of the Harte Trail is doing a sufficient job of promoting sustainability; however, several areas exist where the management approach could be improved. These aspects are discussed next.

### ***Strengths***

The strengths of the trail system are seen in its maintenance and perceived ecological and social values. The findings can be summarized in the following nine points. The trail:

1. Is an essential feature of the Charleswood community.
2. Provides an area away from vehicles where people can partake in recreation.
3. Is well-maintained across all seasons.
4. Connects to other trail systems and areas within Winnipeg.
5. Demonstrates the unique local history of Charleswood.
6. Provides an opportunity for different groups of people to connect.
7. Provides habitat for wildlife while preserving urban biodiversity.
8. Increases human connection to nature.
9. Allows people to practice stewardship and participate in sustainable initiatives like tree planting

## *Weaknesses*

Eight general themes emerged as points of future consideration. They include:

1. The narrow gravel trail corridors sometimes provide insufficient space for cyclists and pedestrians. This lack of space creates conflicts between recreationists and, in certain instances, poses safety concerns for trail users.
2. The lack of adequate lighting on certain portions of the trail results in certain recreationists feeling unsafe at night.
3. Poor enforcement of rules, such as dogs being off-leash and littering or dumping, jeopardizes the area's ecology and adversely affects the trail user experience.
4. The Harte Trail lacks safe connection points to northern Charleswood, and the Headingley Grand Trunk Trail west of the perimeter highway.
5. The trail itself lacks Indigenous participation and interpretation.
6. The absence of a well-defined management plan creates barriers to ecological preservation and partnerships between stakeholders and other organizations.
7. There is a need for more community and volunteer involvement.
8. Budgetary constraints.

Regenerative ideas should be employed to help combat some of these weak points while promoting the positive aspects of the trail's management system listed above. For example, creating a management plan, forming partnerships, and exploring infrastructure changes may help improve the general sustainability level associated with the Harte Trail. Given these ideas, it is also critical to consider some limitations of this study. These limitations provide areas where future studies may benefit the Harte Trail.

## *Limitations*

Using both an Internet survey and key informant interviews inherently has several limitations. It is difficult to generalize the results from the survey. This difficulty implies that it is hard to apply results from the survey to an entire population (O’Leary, 2017; Chittaranjan, 2020). Respondents must be sufficiently interested in the subject to respond, or else they would not feel compelled to participate (Chittaranjan, 2020). This interest may introduce non-response bias into the research process and often does not enable easily quantifiable statistical analysis (O’Leary, 2017; Chittaranjan, 2020). While a well-designed survey works to limit bias, it is challenging to assess the credibility of every respondent and almost impossible to reach them for further comments or clarification (O’Leary, 2017). A significant limitation facing key informant interviews is the response and participation rate. To an extent, this limited the perspective existing in the data. In the event of a future study, it may be pertinent to engage with other stakeholder groups in Winnipeg again and reassess their willingness to participate. More participation may increase the validity of the data and help discover more weaknesses and strengths of the Harte Trail. This increase in participation may encourage the development of more regenerative design practices. Another limitation is that neither the survey nor the interviews were pre-tested. Pre-testing is administering the data collection tools to a small group of respondents before commencing the large-scale study (Office of the Auditor General of Canada, n.d.). Pre-testing will help to identify any issues in the data collection tools and work to find solutions for them. This pre-test helps prevent the need to make any difficult or impossible changes to the instrument once the data collection period has commenced (Office of the Auditor General of Canada, n.d.). Using a pre-test may have helped to identify any leading or unclear questions posed by this research. Using a pre-test may have helped to gain more meaningful insights into the Harte Trail from participants in the data collection period.

Several limitations apply to the research conducted throughout this study. It is necessary to address these issues to provide areas where future research on the Harte Trail may be helpful. A significant issue throughout this study is stakeholder representation. Despite best efforts, several groups

which may have an interest in the Harte Trail are not represented in this study. For example, government offices, local indigenous groups, and other community organizations may have valuable input into this research. Gaining this expertise is something that future research in this area will need to address. One way to increase this participation is by scheduling focus group sessions. Consider using focus groups for future inquiries into the Harte Trail management system. Focus groups involve discussions with roughly 4-12 people, designed to obtain data from people in an open and non-threatening way (O’Leary, 2017; Gundumogula, 2021). Bringing members of stakeholder groups together to facilitate a discussion may prove beneficial for developing data and discovering complexities (Kamberelis & Dimitriadis, 2013; O’Leary, 2017). While focus groups carry some issues and limitations, they may be a logical next step for qualitative research on the Harte Trail. Recognizing some boundaries and challenges associated with the data collection tools used in this study is essential.

Given these limitations, the following section highlights this specific study and provides recommendations from the data analysis. Decision-makers can contemplate these recommendations to improve sustainability within the Harte Trail system.

## Conclusion and Recommendations

### *Conclusion*

The Harte Trail is a beloved feature of the Charleswood neighbourhood. It serves as an important link to nature, a space for recreation, and a reflection of sustainable values. Guided by the principles of sustainability, this study highlights the trail's successes while identifying opportunities for improvement to strengthen its contribution within the surrounding community. One central question guided the research:

1. What aspects of trail management can be improved on the Harte Trail in Winnipeg, Manitoba, to generate more sustainable outcomes?

Based on this primary question, three research objectives were formulated to guide the study and assess results:

1. Examine the current state of the Harte Trail.
2. Identify strengths and weaknesses of the current system surrounding the Harte Trail.
3. Provide recommendations for regenerative practices of the Harte Trail.

A case study was conducted on the Harte Trail using a qualitative methodology. This approach is cohesive with the framework of a sustainability assessment as diverse stakeholder views, location specific challenges, and complexity can be evaluated. This helped showcase how important the Harte Trail is to the community, while also discovering new variables which decision-makers can consider.

A public engagement survey and a slate of key-informant interviews were used as to gain insights into the research objectives and to help answer the research question. One hundred nineteen people participated in the public engagement survey. These data were primarily used to help meet research objectives one and two. The questions focused on the current state of the trail, what was working with its system, and what should be fixed. The analysis focused on collective responses as opposed to individual ideas. The themes in these data were relevant to gaining evidence-based insights to develop a current picture of the Harte Trail.

Additionally, six key informants were interviewed as part of this study. Members from the *Friends of the Harte Trail*, *Trails Manitoba*, *City of Winnipeg: Parks and Open Spaces*, and *City of Winnipeg: Naturalist Services* provided knowledge and answered ten questions regarding the Harte Trail. Insights gained from these interviews were relevant to answering all three research objectives.

The data obtained from these research methods was analyzed through an inductive approach using an iterative process. The researcher created a data analysis guide based on the principles of qualitative data analysis to ease this process. Several vital findings showcased how the Harte trail currently operates, the strengths and weaknesses of its system, and opportunities for regenerative management practices to be implemented. It is well established that the Harte Trail is viewed as an important area within the community. It is well-maintained across seasons and generally fulfills its role as a vessel for active transportation, connecting to nature, and urban biodiversity conservation. Weaknesses such as concerns with safety, conflicts primarily between cyclists and pedestrians, and poor connectivity along specific transition points of the Harte Trail were noted. Moreover, the lack of a transparent management plan compounds issues such as volunteer engagement, budgetary constraints, and partnerships with other organizations. The lack of a management plan creates uncertainty within organizations for their specific roles on the trail. The final key finding of the data analysis indicated that the Harte Trail needs Indigenous presence and input. Based on these findings, the following recommendations are provided:

1. Create a well-defined management plan develop by all stakeholders.
2. Develop partnerships with local stakeholders, schools, Fort Whyte Alive, and Assiniboine Park.
3. Integrate and involve Indigenous peoples in the management of the Harte Trail.
4. Consider infrastructural changes. These considerations would alleviate the safety concerns identified in this study.

5. Given the general success of the Harte Trail's management, it is essential to continue supporting the measures that have created these circumstances.

### ***Recommendations***

While circumstances constantly change, it is worth considering regenerative practices aimed at preserving and improving the trail's function and role in the community. These practices are practical steps or changes which can be made to improve the function of the Harte Trail. Five recommendations based on themes from the data are stated below. These ideas can help the Harte Trail now and in the future.

#### ***1) Create a well-defined management plan agreed on by all stakeholders***

Creating a well-defined management plan may eliminate confusion between stakeholder groups and unify organizational goals and responsibilities regarding the trail's management. Presently, no concrete and tangible management plan exists for the Harte Trail. As Bertsy and associates (2012) noted, while management plans are essential prerequisites for protected areas such as the Harte Trail, it is not uncommon for protected areas to have outdated or no management plan (Bertsy et al., 2012). However, considering that monitoring is vital to sustainability practices, a management plan would help establish and subsequently monitor this protected area's ecological and cultural heritage. As such, the City of Winnipeg and interested stakeholders should develop, implement, and review a management plan for the area. Clearly defining responsibilities will help stakeholders fulfill their roles. For example, the City of Winnipeg is responsible for maintenance tasks; stating these tasks and their parameters may help increase organizational efficiency. This clarity may also benefit other stakeholders as they can focus on issues like community engagement or funding instead. It also helps increase accountability by assigning specific tasks to organizations that will know their responsibilities for the Harte Trail.

Additionally, a management plan can be used to communicate goals and objectives for the future of the Harte Trail. For example, one significant issue from the analysis was the need for a safe crossing at

the western edge of the trail. Respondents indicated that constructing a crossing between the Harte Trail and Headingley Grand Trunk Trail is a desirable long-term goal. This project is a significant undertaking that will ultimately take many resources. Creating a management plan may ease the process of coordinating the actions needed to fulfill this goal. Trails Manitoba could seek funding for this project through different levels of government. At the same time, Friends of the Harte Trail can work on involving and engaging the communities along the trail while the City of Winnipeg designs an effective strategy to build the crossing. Developing, establishing, and regularly reviewing a management plan provides a tangible nature to the Harte Trail system, which helps limit confusion and meet goals. Reviewing this plan may help account for changing circumstances and encourage better decision-making.

### ***II) Create mutually beneficial partnerships with other organizations***

The Harte Trail is situated in an urban and ecologically significant area of the city (Naturalist Services Branch, 2002; Friends of the Harte Trail, 2019; Qualico Communities, 2024). Several schools, along with *Assiniboine Park* and *Fort Whyte Alive*, can be found along or near the trail. Collaborating with the Assiniboine Park, Fort Whyte Alive, and local schools will help provide environmental education to students while increasing community support for the Harte Trail. For example, EcoSchools is an internationally recognized certification framework for schools and outdoor environmental education hubs (EcoSchools, 2024). The Harte Trail could serve as a vessel for a certification program like this.

### ***III) Create mutually beneficial partnerships with Indigenous peoples***

The absence of Indigenous peoples in the management and use of the trails in an era of reconciliation is particularly disturbing. For example, Assiniboine Park Conservancy and Fort Whyte Alive have partnered with local Indigenous groups to showcase their culture and support reconciliation. For example, in 2021, Assiniboine Park established the Indigenous Peoples Garden to celebrate Indigenous culture in Winnipeg. The area was created by collaborating with local Indigenous leaders such as elders, designers, and community members (Assiniboine Park Conservancy, 2021). Fort Whyte Alive

has an educational program for elementary school students called “People of the Prairies” (Fort Whyte Alive, 2021). This program educates students on the prairies’ state before European colonization. Given what these nearby areas have done, it should be possible to partner with local groups and celebrate Indigenous heritage to a greater extent on the Harte Trail.

#### ***IV) Review infrastructure possibilities***

A primary concern along the Harte Trail is the safety of trail users. A very prominent theme within the data was conflicts between cyclists and pedestrians. This theme is common amongst multi-use areas such as the Harte Trail and has been seen in multiple jurisdictions worldwide (Huemer et al., 2018; Zheng et al., 2020). These conflicts are a common and complex issue. While it is unlikely for this issue to be completely resolved, several potential solutions exist to limit the frequency and severity of these interactions.

Given that the painting of a centre line on crushed gravel is ineffective, and the construction of an additional trail separating pedestrians and cyclists is unlikely, conflicts between these two user groups are likely to continue. Gkekas and associates (2020) say conflicts between pedestrians and cyclists are common. Gkekas and associates (2020) found that the predominant reasons for these conflicts were inattention from pedestrians, excessive speed from cyclists, and overcrowding of areas (Gkekas et al., 2020). Gkekas et al. (2020) suggest that signage can help minimize conflicts along multi-use trails. In addition, providing the best cycling and pedestrian practices on multi-use trails through social media and local cycling and pedestrian groups may help reduce negative interactions.

Additionally, it may be worthwhile for decision-makers to contemplate increasing the lighting on and around the Harte Trail. However, the benefits and drawbacks of this strategy must be carefully evaluated before being implemented. For example, ecological light pollution is an artificially induced increase in illumination in natural areas (Longcore & Rich, 2004). Light pollution adversely affects the

natural circadian rhythms of wildlife, particularly migratory bird species (Burt et al., 2023). The benefit of increasing lighting is that it may help pedestrians and other users feel safer using the trail at nighttime.

#### ***V) Continue to support the Harte Trail's essential function***

The Harte Trail is clearly an essential place within the community (McFee, 2020; Driedger, 2022; Keele, 2023). This importance is seen through people's extensive interest in the area and many initiatives that work to strengthen the trail. It is critical to continue supporting successful initiatives such as tree plantings and recreational activities. Stakeholders should continue pursuing opportunities to enhance these practices. This support can be achieved by committing to annual increases in native species plantings and supporting recreational activities (like geocaching and annual bird counts) on the trail.

#### ***Study Summary***

The present information broadly contributes to filling the knowledge gap surrounding public spaces in Winnipeg. This study may serve as a framework for future assessments of Winnipeg's urban trails and public spaces. Nine strengths and eight weaknesses of the Harte Trail were identified through this assessment. These findings display how the Harte Trail currently operates in the community and its role in sustainability. By employing these recommendations, decision-makers may benefit the trail by reinforcing strengths and minimizing weaknesses. They may also aid in improving the general sustainability of the area, ensuring that the Harte Trail continues to benefit humans and wildlife alike.

## References

- Adams, M. M., & Miller, J. G. (2022). The flexible nature of everyday reciprocity: reciprocity, helping, and relationship closeness. *Motivation and Emotion*, 46(4), 461–475.  
<https://doi.org/10.1007/s11031-022-09949-y>
- Alberta Parks. (2023). *Benefits of Parks*. Alberta Parks. Retrieved April 17, 2023, from <https://www.albertaparks.ca/albertaparksca/management-land-use/building-the-parks-system/benefits-of-parks/>
- Ardoin, N. M., Bowers, A. W., Roth, N. W., & Holthuis, N. (2018). Environmental education and k-12 student outcomes: a review and analysis of research. *Journal of Environmental Education*, 49(1), 1–17.
- Assiniboine Park Conservancy. (2021, June 21). *Spotlight on the Indigenous Peoples Garden*.  
<https://www.assiniboinepark.ca/stories/55/spotlight-on-the-indigenous-peoples-garden>
- Assiniboine Park Conservancy. (2022). *Assiniboine Park: 2022 Annual Report*. Assiniboine Park.  
[https://www.assiniboinepark.ca/uploads/public/documents/2022\\_AnnualReport.pdf](https://www.assiniboinepark.ca/uploads/public/documents/2022_AnnualReport.pdf)
- Bainbridge, D. A. (1974). Trail Management. *Bulletin of the Ecological Society of America*, 55(3), 8–10.  
<http://www.jstor.org/stable/20165994>
- Bartosh, O., Ling, C., Dushenko, B. (2021). *Qualitative data analysis* [Lecture notes]. Royal Roads University Research and Analysis Moodle.  
<https://moodle.royalroads.ca/moodle/course/view.php?id=8256&section=6>
- Berrigan, D., Troiano, R. P., McNeel, T., Disogra, C., & Ballard-Barbash, R. (2006). Active transportation increases adherence to activity recommendations. *American Journal of Preventive Medicine*, 31(3), 210–6.
- Berryman, D. R. (2019). Ontology, epistemology, methodology, and methods: information for librarian researchers. *Medical Reference Services Quarterly*, 38(3), 271–279.  
<https://doi.org/10.1080/02763869.2019.1623614>

- Bertsky, B., Corrigan, C., Kemsy, J., Kenney, S., Ravilous, C., Besançon, C., Burgess, N. (2012). Protected Planet Report 2012: Tracking Progress Towards Global Targets for Protected Areas. *UNEP*. [https://www.iucn.org/sites/dev/files/import/downloads/protected\\_planet\\_report.pdf](https://www.iucn.org/sites/dev/files/import/downloads/protected_planet_report.pdf)
- Bishop, R. C. (1993). Economic efficiency, sustainability, and biodiversity. *Ambio*, 22(2-3), 69–73.
- Boddice, R. (2011). *Anthropocentrism: humans, animals, environments* (Ser. Human-animal studies, 1573-4226, 12). Brill. <https://doi.org/10.1163/ej.9789004187948.i-348>
- Bootrach, P., Thiengkamol, N., & Thiengkamol, T. K. (2015). Environmental education strategy. *Applied Environmental Education and Communication*, 14(4), 200–212.
- Boyce, J. K., Narain, S., & Stanton, E. A. (2007). *Reclaiming nature: environmental justice and ecological restoration* (Ser. Anthem studies in development and globalization). Anthem Press. Retrieved January 28, 2022, from <https://ebookcentral.proquest.com/lib/royalroads-ebooks/reader.action?docID=840484&ppg=1>.
- Boyd, D. (2019). Utilising place-based learning through local contexts to develop agents of change in early childhood education for sustainability. *Education 3-13*, 47(8), 983–997.
- Boyden, S. V. (2016). *The bionarrative: the story of life and hope for the future*. ANU Press. <https://doi.org/10.22459/B.08.2016>
- Braun, V., Clarke, V., Boulton, E., Davey, L., & McEvoy, C. (2021). The online survey as a qualitative research tool. *International Journal of Social Research Methodology*, 24(6), 641–654. <https://doi.org/10.1080/13645579.2020.1805550>
- Brennan, A., & Lo, N. Y. S. (2021, December 3). *Environmental ethics*. Stanford Encyclopedia of Philosophy. <https://plato.stanford.edu/archives/sum2022/entries/ethics-environmental/>
- Briggs, S. L. K. (2022). Standards and sustainability. *Quality Progress*, 55(1), 18–18
- Brundtland Commission. (1987). *Report of the World Commission on Environment and Development: Our Common Future*. United Nations Academic Impact. Retrieved October 19, 2022, from <http://www.un-documents.net/our-common-future.pdf>

- Burt, C. S., Kelly, J. F., Trankina, G. E., Silva, C. L., Khalighifar, A., Jenkins-Smith, H. C., Fox, A. S., Frstrup, K. M., & Horton, K. G. (2023). The effects of light pollution on migratory animal behavior. *Trends in Ecology & Evolution*, *38*(4), 355–368.  
<https://doi.org/10.1016/j.tree.2022.12.006>
- Bussey, M. (2014). Concepts and effects: ordering and practice in foresight. *Foresight: The Journal of Futures Studies, Strategic Thinking and Policy*, *16*(1), 1–16. <https://doi.org/10.1108/FS-04-2013-0017>
- Butler, R.W., Fennell, D.A. and Boyd, S.W. (1996). Canadian Heritage Rivers System recreational carrying capacity study. *CHRS Rivers Conference*, 100– 126.  
<http://parkscanadahistory.com/publications/chrs/ann-rpt/1995-1996-e.pdf>
- Camrass, K. (2020). Regenerative futures. *Foresight*, *22*(4), 401–415. <https://doi.org/10.1108/FS-08-2019-0079>
- Chapman, P. (2014). Environmental education and sustainability. *Independent School*, *73*(4).
- Chittaranjan, A. (2020). The limitations of online surveys. *Indian Journal of Psychological Medicine*, *42*.  
<https://doi.org/10.1177/0253717620957496>
- City of Winnipeg Charter, S.M. 2002, c. 39. (2002).  
<https://web2.gov.mb.ca/laws/statutes/municipal/c03902e.php>
- City of Winnipeg Parks By-law, No. 85/2009. (2009).  
<https://clkapps.winnipeg.ca/dmis/docext/viewdoc.asp?documenttypeid=1&docid=4751>
- City of Winnipeg. (2020, March 5). *Naturalist Services*. Naturalist Services - Parks and Open Space - Public Works - City of Winnipeg.  
<https://legacy.winnipeg.ca/publicworks/parksOpenSpace/NaturalistServices/default.stm#:~:text=From%20flowers%2C%20birds%20and%20butterflies,that%20call%20these%20areas%20home.>
- City of Winnipeg. (2022). *OurWinnipeg 2045*. <https://www.winnipeg.ca/building-development/city-planning-design/ourwinnipeg/ourwinnipeg-2045>

- Cole, A. G. (2007). Expanding the field: revisiting environmental education principles through multidisciplinary frameworks. *Journal of Environmental Education*, 38(2), 35–45.
- Convention on Biological Diversity. (1992). Convention on Biological Diversity. United Nations. <https://www.cbd.int/doc/legal/cbd-en.pdf>
- Cook, K. (2017). *Trails and tales: The transformative experience of volunteer trail building trips on Meares Island, B.C* (thesis). Proquest/*Trails and tales: The transformative experience of volunteer trail building trips on Meares Island, B.C*. Royal Roads University. Retrieved 2022, from <https://www.proquest.com/docview/1889195524?pq-origsite=gscholar&fromopenview=true>.
- Cornell Lab of Ornithology. (2025). *About eBird*. eBird. <https://ebird.org/about>
- Craft, W., Ding, L., Prasad, D., Partridge, L., & Else, D. (2017). Development of a regenerative design model for building retrofits. *Procedia Engineering*, 180, 658–668. <https://doi.org/10.1016/j.proeng.2017.04.225>
- Cronon, W. (1996). *Uncommon ground: rethinking the human place in nature*. W.W. Norton & Co.
- Dale, A. (2023, March 16). *Why regenerative sustainability?*. Why Regenerative Sustainability? <https://www.royalroads.ca/why-regenerative-sustainability#:~:text=Regenerative%20sustainability%20is%20not%20simply,to%20human%20and%20ecological%20systems>.
- Dickinson, E. (2016). Ecocultural conversations: bridging the human-nature divide through connective communication practices. *The Southern Communication Journal*, 81(1), 32–48. <https://doi.org/10.1080/1041794X.2015.1065289>
- Driedger, M. (2022, June 1). Trails are just two of Roblin’s natural treasures. *Winnipeg Free Press*. Retrieved 2023, from <https://www.winnipegfreepress.com/our-communities/correspondents/2022/06/01/trails-are-just-two-of-roblins-natural-treasures>.

- eBird. (2025). *Bird list - winnipeg--assiniboine forest, Winnipeg, Manitoba, Canada - ebird hotspot*.  
[https://ebird.org/hotspot/L283895/bird-list?rank=hc&hs\\_sortBy=count](https://ebird.org/hotspot/L283895/bird-list?rank=hc&hs_sortBy=count)
- EcoSchools. (2024, May 8). *Who we are - EcoSchools Canada*. EcoSchools Canada - Every School an EcoSchool. <https://ecoschools.ca/about/who-we-are/>
- Environment and Climate Change Canada. (2024, May 14). *Toward a National Framework for Environmental Learning: Discussion Paper*. Government of Canada.  
<https://www.canada.ca/en/environment-climate-change/corporate/transparency/consultations/national-framework-environmental-learning/discussion-paper.html>
- Ermagun, A., Lindsey, G., & Loh, T. H. (2018). Urban trails and demand response to weather variations. *Transportation Research Part D*, 63, 404–420.  
<https://doi.org/10.1016/j.trd.2018.05.016>
- Fastré, C., Possingham, H. P., Strubbe, D., & Matthysen, E. (2020). Identifying trade-offs between biodiversity conservation and ecosystem services delivery for land-use decisions. *Scientific Reports*, 10(1). <https://doi.org/10.1038/s41598-020-64668-z>
- Fisher, J. T., Grey, F., Anderson, N., Sawan, J., Anderson, N., Chai, S.-L., Nolan, L., Underwood, A., Amerongen Maddison, J., Fuller, H. W., & Frey, S. (2021). Indigenous-led camera-trap research on traditional territories informs conservation decisions for Resource Extraction. *FACETS*, 6, 1266–1284. <https://doi.org/10.1139/facets-2020-0087>
- Fort Whyte Alive. (2021). *People of the prairies*. <https://www.fortwhyte.org/wp-content/uploads/2021/09/People-of-the-Prairies.pdf>
- Fort Whyte Alive. (2024, April 19). *About*. FortWhyte Alive. <https://www.fortwhyte.org/about/>
- Freebody, P. (2003). *Qualitative research in education: interaction and practice* (Ser. Introducing qualitative methods). SAGE Publications. Retrieved February 3, 2022, from <https://methods.sagepub.com/book/qualitative-research-in-education>

- Friends of the Harte Trail. (2019, November 11). *Wildlife Awareness*.  
<https://www.hartetrail.com/news/wildlife-awareness>
- Gkekas, F., Bigazzi, A., & Gill, G. (2020). *Perceived safety and experienced incidents between pedestrians and cyclists in a high-volume non-motorized shared space. 4*.  
<https://doi.org/10.1016/j.trip.2020.100094>
- Gruenewald, D. (2008). The best of both worlds: a critical pedagogy of place. *Environmental Education Research, 14*(3), 308–324. <https://doi.org/10.1080/13504620802193572>
- Gundumogula, M. (2021). Importance of focus groups in qualitative research. *The International Journal of Humanities and Social Studies, 8*(11). <https://doi.org/10.24940/theijhss/2020/v8/i11/hs2011-082>
- Hagel, B. E., Macpherson, A., Howard, A., Fuselli, P., Cloutier, M.-S., Winters, M., Richmond, S. A., Rothman, L., Belton, K., Buliung, R., Emery, C. A., Faulkner, G., Kennedy, J., Ma, T., Macarthur, C., McCormack, G. R., Morrow, G., Nettel-Aguirre, A., Owens, L., ... Hubka, T. (2019). The built environment and active transportation safety in children and youth: A study protocol. *BMC Public Health, 19*(1). <https://doi.org/10.1186/s12889-019-7024-6>
- Harnik, P. (2021). *From rails to trails: the making of America's active transportation network*. University of Nebraska Press.  
<http://search.ebscohost.com/login.aspx?direct=true&scope=site&db=nlebk&db=nlabk&AN=2891196>
- Huemer, A. K., Oehl, M., & Brandenburg, S. (2018). Influences on anger in German urban cyclists. *Transportation Research Part F: Psychology and Behaviour, 58*, 969–979.  
<https://doi.org/10.1016/j.trf.2018.07.026>
- Jordan, G., & Leso, L. (2000). Power of the Line: Shared-Use Path Conflict Reduction. *Transportation Research Record, 1705*(1), 16–19. <https://doi.org/10.3141/1705-03>

- Kamberelis, G., & Dimitriadis, G. (2013). *Focus groups: from structured interviews to collective conversations*. Routledge. <https://doi.org/10.4324/9780203590447>
- Keele, J. (2023, March 2). 'It's unsafe': Groups pushing for safe crossing at Trans Canada Trail. *CTV News: Winnipeg*. Retrieved 2023, from <https://winnipeg.ctvnews.ca/it-s-unsafe-groups-pushing-for-safe-crossing-at-trans-canada-trail-1.6296402>.
- Keniger, L. E., Gaston, K. J., Irvine, K. N., & Fuller, R. A. (2013). What are the benefits of interacting with nature? *International Journal of Environmental Research and Public Health*, *10*(3), 913–35. <https://doi.org/10.3390/ijerph10030913>
- Kopnina, H., & Washington, H. (2020). *Conservation: integrating social and ecological justice*. Springer. <https://doi.org/10.1007/978-3-030-13905-6>
- Lackey, N. Q., Tysor, D. A., McNay, G. D., Joyner, L., Baker, K. H., & Hodge, C. (2021). Mental health benefits of nature-based recreation: a systematic review. *Annals of Leisure Research*, *24*(3), 379–393. <https://doi.org/10.1080/11745398.2019.1655459>
- Lee, K. H. (2020). Mental health and recreation opportunities. *International Journal of Environmental Research and Public Health*, *17*(24). <https://doi.org/10.3390/ijerph1724933>
- Lin, Y. H., & Lee, T. H. (2020). How do recreation experiences affect visitors' environmentally responsible behavior? Evidence from recreationists visiting ancient trails in Taiwan. *Journal of Sustainable Tourism*, *28*(5), 705–726. <https://doi.org/10.1080/09669582.2019.1701679>
- Loh, T. H., Walljasper, J., Sonenklar, D., Mills, K., & Levinger, D. (2011). *Active Transportation Beyond Urban Centers*. Rails to Trails. Retrieved April 17, 2023, from <https://www.railstotrails.org/resourcehandler.ashx?id=4141>
- Longcore, T., & Rich, C. (2004). Ecological light pollution. *Frontiers in Ecology and the Environment*, *2*(4), 191. <https://doi.org/10.2307/3868314>

- Lyle, J. T. (1994). *Regenerative Design for Sustainable Development*. Google Scholar. John Wiley and Sons. Retrieved 2022, from <https://books.google.ca/books?hl=en&lr=&id=qB3v3gYofSUC&oi=fnd&pg=PR9&dq=Regenerative+design+for+sustainable+development+lyle&ots=Ddciom9Jbi&sig=HUwaaJSOFIkkzpXQ22Rpfk3Z1OY#v=onepage&q=Regenerative%20design%20for%20sustainable%20development%20lyle&f=false>.
- Lynch, J., Vogt, C., Cindrity, S., & Nelson, C. (2002). (rep.). *Measuring and Monitoring Trail Use: A Nationwide Survey of State and Federal Trail Managers* (pp. 1–25). East Lansing , MI: Michigan State University . Retrieved 2023, from [https://www.academia.edu/62018973/Measuring\\_and\\_Monitoring\\_Trail\\_Use\\_A\\_Nationwide\\_Survey\\_of\\_State\\_and\\_Federal\\_Trail\\_Managers](https://www.academia.edu/62018973/Measuring_and_Monitoring_Trail_Use_A_Nationwide_Survey_of_State_and_Federal_Trail_Managers).
- Lynn, N. A., & Brown, R. D. (2003). Effects of recreational use impacts on hiking experiences in natural areas. *Landscape and Urban Planning*, 64(1), 77–87. [https://doi.org/10.1016/S0169-2046\(02\)00202-](https://doi.org/10.1016/S0169-2046(02)00202-)
- Mang, P., & Haggard, B. (2016). *Regenerative development and design: a framework for evolving sustainability*. Wiley. Retrieved February 3, 2022, from <https://ebookcentral.proquest.com/lib/royalroads-ebooks/reader.action?docID=4627926&ppg=1>
- Manitoba Natural Resources and Northern Development. (2023). *Trails strategy and action plan*. Province of Manitoba. <https://manitoba.ca/nrnd/trails/index.html>
- Maria, R., Martínez-García, & Celma. (2018). Economic and social yield of investing in hiking tourism: the case of berguedà, spain. *Journal of Travel & Tourism Marketing*, 35(2), 148–161. <https://doi.org/10.1080/10548408.2017.1350252>
- Maricopa County Parks and Recreation Department. (2018, May 15). *Trails Management Manual*. American Trails. [https://cdn2.assets-servd.host/material-civet/production/images/documents/2018\\_Trails\\_Management\\_Training\\_Manual\\_Update.pdf](https://cdn2.assets-servd.host/material-civet/production/images/documents/2018_Trails_Management_Training_Manual_Update.pdf)

- Marilyn, M. R. (1998). Ontology, epistemology, and methodology: a clarification. *Nursing Science Quarterly*, 11(1), 2–4. <https://doi.org/10.1177/089431849801100102>
- McFee, J. (2020, January 28). Friends of the Harte Trail aims for 150 members. *Winnipeg Free Press*. Retrieved 2023, from <https://www.winnipegfreepress.com/our-communities/metro/2020/01/28/friends-of-harte-trail-aims-for-150-members>.
- McGavock, J., Hobin, E., Prior, H. J., Swanson, A., Smith, B. T., Booth, G. L., Russell, K., Rosella, L., Isaranuwachai, W., Whitehouse, S., Brunton, N., & Burchill, C. (2022). Multi-use physical activity trails in an urban setting and cardiovascular disease: a difference-in-differences analysis of a natural experiment in winnipeg, manitoba, canada. *International Journal of Behavioral Nutrition and Physical Activity*, 19(1). <https://doi.org/10.1186/s12966-022-01279-z>
- McShane, T. O., Hirsch, P. D., Trung, T. C., Songorwa, A. N., Kinzig, A., Monteferri, B., Mutekanga, D., Thang, H. V., Dammert, J. L., Pulgar-Vidal, M., Welch-Devine, M., Peter Brosius, J., Coppolillo, P., & O'Connor, S. (2011). Hard choices: Making trade-offs between biodiversity conservation and human well-being. *Biological Conservation*, 144(3), 966–972. <https://doi.org/10.1016/j.biocon.2010.04.038>
- Microsoft. (n.d.). [*Martin-Bing Maps*]. Retrieved August 21, 2024, from <https://www.bing.com/maps?cp=49.849752%7E-97.287575&lvl=13.6&style=a>
- Microsoft. (n.d.). *Microsoft Publisher* [Computer software].
- Minkus, D. (2021, December 3). How the harte trail came to be. *Winnipeg Free Press*. Retrieved August 12, 2024, from <https://www.winnipegfreepress.com/our-communities/metro/2021/12/03/how-the-harte-trail-came-to-be>.
- Moore, R. L., & Ross, D. T. (1998). Trails and recreational greenways. *Parks & Recreation*, 33(1). <https://web.p.ebscohost.com/ehost/detail/detail?vid=0&sid=31fde4b1-356b-4cda-95f8-aaba80fc3acc%40redis&bdata=JkF1dGhUeXBIPXNzbw%3d%3d#AN=193163&db=aph>

- Müller Sabine Lenore (Ed.). (2017). *From ego to eco: mapping shifts from anthropocentrism to ecocentrism* (Ser. Nature, culture and literature, volume 13). Brill Rodopi. Retrieved December 18, 2023, from <https://ebookcentral.proquest.com/lib/royalroads-ebooks/reader.action?docID=5570617>.
- Muellmann, S., Brand, T., Jürgens, D., Gansefort, D., & Zeeb, H. (2021). How many key informants are enough? analysing the validity of the community readiness assessment. *BMC Research Notes*, *14*(1), 85–85. <https://doi.org/10.1186/s13104-021-05497-9>
- Næss, A. (1990). *Ecology, community, and lifestyle: outline of an ecosophy* (1st pbk.). Cambridge University Press
- National Parks Service. (2018). *Benefits of hiking*. National Parks Service. Retrieved April 17, 2023, from <https://www.nps.gov/subjects/trails/benefits-of-hiking.htm>
- Naturalist Services Branch. (2002, September 11). *Harte Trail- Habitat Site Report*. City of Winnipeg, Naturalist Services Branch. [https://legacy.winnipeg.ca/publicworks/naturalist/ns/natural\\_areas/NA\\_Reports/617.html](https://legacy.winnipeg.ca/publicworks/naturalist/ns/natural_areas/NA_Reports/617.html)
- Niklasson, M., Nilsson, S., Hedin, J., Caldiz, M., & Bobiec, A. (2006). Sustainability and biodiversity. *Journal of Sustainable Forestry*, *21*(2-3), 213–226.
- Njie, B., & Asimiran, S. (2014). Case study as a choice in qualitative methodology. *IOSR Journal of Research & Method in Education (IOSRJRME)*, *4*(3), 35–40. <https://doi.org/10.9790/7388-04313540>
- Odjick, J. (2000). The Trans Canada Trail now officially open. *Windspeaker*, *18*(6), 14.
- Office of the Auditor General of Canada. (n.d.). *Section 12: Pre-testing Data Collection Instruments*. Section 12: Pre-Testing Data Collection Instruments. [https://www.oag-bvg.gc.ca/internet/English/meth\\_gde\\_e\\_19734.html](https://www.oag-bvg.gc.ca/internet/English/meth_gde_e_19734.html)
- O'Leary, Z. (2017). *The essential guide to doing your research project* (3rd ed.). Sage Publications Ltd.

- Park, H., & Kao, G. (Eds.). (2018). Research in the sociology of education (First, Ser. Research in the sociology of education, v. 20). Emerald Publishing Limited. Retrieved April 17, 2023, from <https://ebookcentral.proquest.com/lib/royalroads-ebooks/detail.action?docID=5553863>
- Palmer-Cooper, J. A. (1998). *Environmental education in the 21st century : theory, practice, progress and promise*. Taylor & Francis. Retrieved April 18, 2023, from <https://ebookcentral.proquest.com/lib/royalroads-ebooks/reader.action?docID=169959>
- Pope, J., Annandale, D., & Morrison-Saunders, A. (2004). Conceptualising sustainability assessment. *Environmental Impact Assessment Review*, 24(6), 595–616. <https://doi.org/10.1016/j.eiar.2004.03.001>
- Potter, G. (2010). Environmental education for the 21st century: where do we go now? *Journal of Environmental Education*, 41(1).
- Potvin, C., Richards, N. (2015). What is sustainability? *Alternatives Journal*, 41(1), 16–16. Robinson, C., & Cole, J. (2015). Theoretical underpinnings of regenerative sustainability. *Building Research and Information*. 43(2), 133–143. <https://doi.org/10.1080/09613218.2014.979082>
- Pringle, V. (2017). Trans Canada trail celebrates canada 150. *Municipal World*, 127(4), 3–4, 6
- Qualico Communities. (2024). *Native Plants & Grasses*. Our Commitment . <https://www.qualicocommunitieswinnipeg.com/our-commitment/native-plants-grasses>
- Rosa, C. Collado, S. Profice, C. Larson, L. (2019). Nature-based recreation associated with connectedness to nature and leisure satisfaction among students in brazil. *Leisure Studies*, 38(5), 682–691. <https://doi.org/10.1080/02614367.2019.1620842>
- Robinson, C., & Cole, J. (2015). Theoretical underpinnings of regenerative sustainability. *Building Research and Information*. 43(2), 133–143. <https://doi.org/10.1080/09613218.2014.979082>
- Sala, S., Ciuffo, B., & Nijkamp, P. (2015). A systemic framework for sustainability assessment. *Ecological Economics*, 119, 314–325. <https://doi.org/10.1016/j.ecolecon.2015.09.015>

- Santangeli, A., Di Minin, E., Toivonen, T., Pogson, M., Hastings, A., Smith, P., & Moilanen, A. (2016). Synergies and trade-offs between renewable energy expansion and biodiversity conservation - a cross-national multifactor analysis. *GCB Bioenergy*, 8(6), 1191–1200.  
<https://doi.org/10.1111/gcbb.12337>
- Schandl, H., Walker, I. (2017). *Social science and sustainability*. CSIRO Publishing (Australia).  
Retrieved October 19, 2022, from <https://ebookcentral.proquest.com/lib/royalroads-ebooks/reader.action?docID=4860945&ppg=16>
- Schofield, G., Schofield, L., & Mummery, K. (2005). Active transportation: an important part of adolescent physical activity. *Youth Studies Australia*, 24(1).
- Schonlau, M., Fricker, R. D., & Elliott, M. N. (2002). *Conducting research surveys via e-mail and the web*. Rand. Retrieved 2021, from  
[https://web.s.ebscohost.com/ehost/ebookviewer/ebook/bmxlYmtfXzcyNzcwX19BTg2?sid=169d0386-486d-482e-b556-4ac26975abbb@redis&vid=0&format=EB&lpid=lp\\_1&rid=0](https://web.s.ebscohost.com/ehost/ebookviewer/ebook/bmxlYmtfXzcyNzcwX19BTg2?sid=169d0386-486d-482e-b556-4ac26975abbb@redis&vid=0&format=EB&lpid=lp_1&rid=0)
- Srivastava, P., & Hopwood, N. (2009). A practical iterative framework for qualitative data analysis. *International Journal of Qualitative Methods*, 8(1), 76–84.  
<https://doi.org/10.1177/160940690900800107>
- Statistics Canada. (2016). *Census Profile, 2016 Census- Charleswood--St. James--Assiniboia--Headingley*. <https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=FED&Code1=46002&Geo2=PR&Code2=46&SearchTSea=Charleswood--St.%20James--Assiniboia--Headingley&SearchType=Begins&SearchPR=01&B1=All&GeoLevel=PR&GeoCode=46002&TTAB=1&type=0>
- Statistics Canada. (2019, April 17). *Tracking physical activity levels of Canadians, 2016 and 2017*.  
<https://www150.statcan.gc.ca/n1/daily-quotidien/190417/dq190417g-eng.htm>

- Stebbins, R. A. (2001). *Exploratory research in the social sciences* (Ser. Qualitative research methods, v. 48). SAGE. Retrieved 2022, from <https://methods.sagepub.com/book/exploratory-research-in-the-social-sciences/n1.xml>
- Swan, J. A. (1971). Environmental education: one approach to resolving the environmental crisis. *Environment and Behavior*, 3(3), 223–229. <https://doi.org/10.1177/001391657100300301>
- Taelman, S., Sanjuan-Delmás, D., Tonini, D., & Dewulf, J. (2020). An operational framework for sustainability assessment including local to global impacts: focus on waste management systems. *Resources, Conservation & Recycling*, 162. <https://doi.org/10.1016/j.resconrec.2020.104964>
- Taylor, S. J., Bogdan, R., & DeVault, M. L. (2016). Introduction to qualitative research methods: a guidebook and resource (Fourth edition). John Wiley & Sons, Inc. <http://site.ebrary.com/id/11112417>
- Timothy, D. D. J., & Boyd, P. S. W. (2014). *Tourism and trails: Cultural, ecological and management issues*. Channel View Publications.
- Tongco, M. (2007). Purposive sampling as a tool for informant selection. *Ethnobotany Research and Applications*, 5, 147–158. <https://doi.org/10.17348/era.5.0.147-158>
- Trevors, J. T. (2007). Environmental education. *Water Air and Soil Pollution*, 180(1-4), 1–1
- United Nations. (2015). *The 17 goals | Sustainable Development*. United Nations. Retrieved October 16, 2022, from <https://sdgs.un.org/goals>
- United Nations Educational, Scientific and Cultural Organization. (2023). *Education transforms lives*. UNESCO.org. Retrieved April 17, 2023, from <https://www.unesco.org/en/education>
- US National Parks Service. (2023, February 24). *Social trails... not for socializing (U.S. National Park Service)*. National Parks Service. <https://www.nps.gov/articles/000/social-trails.htm#:~:text=A%20social%20trail%20is%20an,and%20animals%20in%20the%20area>.

- Van den Bosch, M., and W. Bird. (2018). *Oxford Textbook of Nature and Public Health: The Role of Nature in Improving the Health of a Population*. Oxford, UK: Oxford University Press
- Weis, J. S. (1990). Environmental education. *Bioscience*, 40(6)
- West Broadway Community Organization. (2021). *Community Wellbeing and Safety - Active Transportation*. <https://westbroadway.mb.ca/programs/community-wellbeing-and-safety/active-transportation>
- Whitfield, G. P., Paul, P., & Wendel, A. M. (2015). Active transportation surveillance — united states, 1999-2012. *Morbidity and Mortality Weekly Report: Surveillance Summaries*, 64(7), 1–17
- Winter, P. L., Selin, S., Cervený, L., & Bricker, K. (2019). Outdoor Recreation, nature-based tourism, and Sustainability. *Sustainability*, 12(1), 81. <https://doi.org/10.3390/su12010081>
- Wright, D., & Hill, S. B. (Eds.). (2021). *Social ecology and education: transforming worldviews and practices*. Routledge/Taylor & Francis Group. Retrieved January 28, 2022, from <https://www.taylorfrancis.com/chapters/edit/10.4324/9781003033462-4/transformational-learning-priorities-stuart-hill?context=ubx&refId=61d6c17a-9446-429d-ad3f-3eba59b71cc5>
- Zhang, G., Poulsen, D. V., Lygum, V. L., Corazon, S. S., Gramkow, M. C., & Stigsdotter, U. K. (2017). Health-promoting nature access for people with mobility impairments: a systematic review. *International Journal of Environmental Research and Public Health*, 14(7). <https://doi.org/10.3390/ijerph14070703>
- Zheng, L., Sayed, T., & Guo, Y. (2020). Investigating factors that influence pedestrian and cyclist violations on shared use path: An observational study on the Brooklyn bridge promenade. *International Journal of Sustainable Transportation*, 14(7), 503–512. <https://doi.org/10.1080/15568318.2019.1575495>

## Appendices

### *Appendix A.*

#### *Key Informant Recruitment Email*

To whom it may concern,

My name is Bailey Alexander Martin, and I am a graduate student at Royal Roads University conducting a study on the Harte Trail in Charleswood. I graduated with my undergrad from the University of Manitoba in 2020, and have lived in Winnipeg my entire life.

My study is being conducted to help me achieve the necessary research and requirements to help write my thesis and graduate from the program. My research aims to evaluate the current management system on the Harte Trail and assess how it is doing within the lens of sustainability science. By interviewing those with key knowledge of trails and assessing their answers for trends, I aim to offer regenerative design suggestions that work to make the Harte Trail operate more sustainably.

As part of my research, I aim to conduct interviews with several individuals who hold key insights and knowledge regarding the Harte Trail. I selected several organizations to participate in this study based on their interests and the nature of their work, and your organization was identified as such. I would be very interested to speak to any individuals who would have insights on the trail within the organization.


Please let me know if this is a possibility; I look forward to hearing back from you soon. I would be more than happy to discuss my proposed research or answer any questions you may have.

All the best,

Bailey Alexander Martin. (M.A. Candidate, Royal Roads University).

*Appendix B.*

*Public Engagement Survey Recruitment Graphics*



**Your opinion is  
wanted on the  
Harte Trail**



Click the link to participate in a research study



**Your opinion  
is wanted on  
the Harte Trail**

Scan the QR Code  
to participate in  
a research study



## *Appendix C.*

### *Key Informant Consent Form*

#### **Informed Consent Form- Key-Informants**

**Title:** Sustainability Assessment of the Harte Trail

**Researcher:** Bailey Alexander Martin, M.A. Candidate, Royal Roads University.

**Research Supervisor:** Dr. Harvey Lemelin, Professor, Lakehead University.

**Purpose of the research:** To establish which aspects of protected area management can be improved on the Harte Trail in Winnipeg, Manitoba, to generate more sustainable outcomes.

You are invited to participate in a research project about the Harte Trail. You can be expected to devote roughly 30 to 60 minutes of your time conducting a zoom interview with the researcher.

**Research procedures:** You will be asked ten questions related to the current management system surrounding the Harte Trail. The researcher will assess responses to these questions for trends using an iterative data analysis process. Upon completion of this analysis, data will exist on the current strengths and weaknesses of the Harte Trail management system. The researcher will formulate recommendations to showcase how the Harte Trail could operate more sustainably based on this data.

The researcher will hold recordings of participant interviews for one week following transcription of the interview. During this time, the transcription will be sent to you for you to view, and edit. During this time, you are able to invoke your right to withdraw from the study. Following this one-week period, responses will be added to a master file using an anonymous code-based system. Participants will not be identified by name or by their associated organization. However, information regarding which organizations had members involved with the study will be collected in an attempt to disseminate research findings. Following this one-week interval, the researcher will permanently delete the Zoom recordings and the identifying transcription. The anonymous dataset will exist in an encrypted folder, which only the researcher and research supervisor will have access to. The anonymous data set will be permanently deleted once the thesis gains final approvals.

**Risks and benefits:** Minimal risk exists in this research as “the probability and magnitude of possible harms implied by participation in the research are no greater than those encountered by participants in those aspects of their everyday life that relate to the research” (TCPS 2, 2018)<sup>1</sup>.

Benefits to this research exist in the sphere of recreation and sustainability. You are encouraged to share your expert knowledge on the Harte Trail to help improve its management system. This knowledge may benefit trail users who rely on it for transportation and recreation. Additionally, by showcasing how new

---

<sup>1</sup> Canadian Institutes of Health Research., Natural Sciences and Engineering Research Council of Canada., & Social Sciences and Humanities Research Council. (2018). Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans – TCPS 2 (2018).

sustainable initiatives can improve the trail, social benefits may arise in improved local ecology, safety, and welfare, these social benefits may create an improved standard of living for some people.

**Participant Responsibilities:** You are under no obligation to partake in this research. You have a right to withdraw your information from the study for one week after the transcription of the video has been sent to you. Following this time, you will no longer be eligible to remove their answers from the dataset. You can invoke your right to withdraw by contacting the researcher during the one-week review period, or by letting the researcher know during the interview.

You are expected to share their knowledge truthfully and communicate any concerns with the researcher. Any ethical concerns regarding the research or research team can be directed to the Royal Roads office of research ethics.

Organizations will be notified when the thesis reaches its public defense phase. Following final thesis approval, the researcher will again contact them. However, you are under no obligation to disseminate research findings.

**Due Diligence:** Findings from this research are unlikely to be commercialized. No financial gain from the researcher or participants will result from this study.

No actual, potential, or perceived conflicts of interest exist between the researcher and the organizations involved in this study.

By providing consent to this form, you are not waiving your right to legal recourse if any research-related harms result from this study.

**Informed Consent:** I, the undersigned, acknowledge that I have read the above form and hereby provide my informed consent to join this research study.

***Participant:***

***Date:***

***Researcher:***

***Date:***

## *Appendix D.*

### *Public Engagement Survey Consent Form*

#### **Informed Consent Form- Survey**

**Title:** Sustainability Assessment of the Harte Trail

**Researcher:** Bailey Alexander Martin, M.A. Candidate, Royal Roads University.

**Research Supervisor:** Dr. Harvey Lemelin, Professor, Lakehead University.

**Purpose of the research:** To establish which aspects of protected area management can be improved on the Harte Trail in Winnipeg, Manitoba, to generate more sustainable outcomes.

You are invited to participate in a research project about the Harte Trail. Participants can be expected to devote roughly 10 minutes of their time answering survey questions.

**Research procedures:** Participants will be asked thirteen questions related to the current management system surrounding the Harte Trail. The researcher will assess responses to these questions for trends using an iterative data analysis process. Upon completion of this analysis, data will exist on the current strengths and weaknesses of the Harte Trail management system. The researcher will formulate recommendations to showcase how the Harte Trail could operate more sustainably based on this data.

Answers to the survey questions will be anonymously submitted to the researcher through the survey monkey website. Answers to these questions will be held until the thesis has gained its final approvals. No data will be collected on the individual survey respondent, and there will be no practical way to trace their answers back to them.

**Risks and benefits:** Minimal risk exists in this research as “the probability and magnitude of possible harms implied by participation in the research are no greater than those encountered by participants in those aspects of their everyday life that relate to the research” (TCPS 2, 2018)<sup>2</sup>.

Benefits to this research exist in the sphere of recreation and sustainability. Participants are encouraged to share their thoughts on the Harte Trail to help improve its management system. This knowledge may benefit trail users who rely on it for transportation and recreation. Additionally, by showcasing how new sustainable initiatives can improve the trail, social benefits may arise in improved local ecology, safety, and welfare.

**Participant Responsibilities:** Participants are under no obligation to partake in this research. They have a right to withdraw their information from the study simply by exiting the program and failing to submit the

---

<sup>2</sup> Canadian Institutes of Health Research., Natural Sciences and Engineering Research Council of Canada., & Social Sciences and Humanities Research Council. (2018). Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans – TCPS 2 (2018).

survey. Following final submission, participants will no longer be eligible to remove their answers from the dataset.

Participants are expected to share their knowledge truthfully and communicate any concerns with the researcher. Any ethical concerns regarding the research or research team can be directed to the Royal Roads office of research ethics.

Participants will be indirectly notified of the final thesis approval via the same method they were recruited. However, participants are under no obligation to disseminate research findings.

**Due Diligence:** Findings from this research are unlikely to be commercialized. No financial gain from the researcher or participants will result from this study.

No actual, potential, or perceived conflicts of interest exist between the researcher and the organizations involved in this study.

By providing consent to this form, research participants are not waiving their right to legal recourse if any research-related harms result from this study.

**Informed Consent:** By proceeding with the survey you acknowledge that you have read the previous information, and provide your informed consent to participate in the study.

## ***Appendix E.***

### *Key Informant Interview Questions*

#### **Interview Questions:**

1. Do you think the Harte Trail is critical to the community? Why?/why not
2. In your opinion, does the Harte Trail do an adequate job of meeting the recreation and leisure needs of the area? Why or why not?
3. Does the Harte Trail represent the culture of the area and community? Why or why not?
4. In your opinion, does the Harte Trail promote active transportation in Winnipeg? Can this be improved? How?
5. In your opinion, does the management system around the Harte Trail preserve biodiversity in the area? If so, how?
6. Are you aware of any environmental education opportunities for the Harte Trail? If so, what are they? If not, why do you think this is the case?
7. In your opinion is the Harte Trail adequately maintained? Have you noticed any maintenance issues? If so, what are they?
8. Is there collaboration between stakeholders regarding the management of the Harte Trail? Do groups collectively make decisions? How do you think could this be improved?
9. In your opinion, is there a sufficient level of monitoring on the Harte Trail? If issues arise surrounding the safety, ecology, maintenance, and management of the Harte Trail, how are they dealt with? Do you feel this is appropriate? Why or why not?
10. In your own words, what works about the Harte Trail, and what does not work?

## ***Appendix F.***

### *Public Engagement Survey Questions*

#### **Survey Questions:**

1. Do you feel that the Harte Trail is an essential feature of the Charleswood neighborhood?
2. What do you primarily use the Harte Trail for?
3. Does the Harte Trail adequately meet the recreation and leisure needs of the area?
4. Do you feel Indigenous culture is represented along the Harte Trail?
5. Do you feel safe using the Harte Trail?
  - a. If you answered “No,” would you care to comment on why you do not feel safe?
6. Do you feel there is enough enforcement of rules along the Harte Trail? (IE. Unregulated fires, camping, littering, graffiti, pet ownership, noise pollution.)
7. Is the Harte Trail satisfactorily maintained throughout all seasons?
8. Are enough waste disposal sites, such as garbage bins, recycling bins, and cigarette receptacles, present along the Harte Trail?
9. Do you believe the Harte Trail plays a role in combatting the ecological crisis?
10. Does the Harte Trail provide a good area for wildlife to live and perform activities? (IE. Deer, birds, foxes, rodents, etc.)
11. Is there enough replanting initiatives for local flora along the Harte Trail?
12. Are invasive species adequately managed along the Harte Trail? (IE. European Buckthorn, Purple Loosestrife, Dutch Elm Disease, Emerald Ash Borer, etc.)
13. Do you have any other comments you would like to leave regarding any additional aspects of the Harte Trail?

**Appendix G.**

*Public Engagement Survey Analyses Tables*

*Survey Dataset 1 Analysis*

<u>Analysis</u>	<u>Dataset 1</u>	<u>Credibility</u>	<u>Dataset 1</u>
<i>What are the data telling me?</i>	The data showcases that the Harte Trail is essential to the local community.	<i>Do others agree? Is there corroboration?</i>	Yes. Over 99% of respondents agree with this assessment.
<i>What do I want to know?</i>	If constituents still feel the Harte Trail is an integral part of their community identity.	<i>Are there any external motivations?</i>	Unlikely that every respondent is motivated to produce the same answer for the same reason.
<i>What is the relationship to the research?</i>	The basis for the study. Determining if the Harte Trail is worth examining, saving, and improving.	<i>Are any potential biases affecting this data?</i>	None identified.

*Survey Dataset 2 Analysis*

<u>Analysis</u>	<u>Dataset 2</u>	<u>Credibility</u>	<u>Dataset 2</u>
<i>What are the data telling me?</i>	That the Harte Trail has six primary uses, with many people using it for multiple things.	<i>Do others agree? Is there corroboration?</i>	Data suggests many people use the Harte Trail for similar reasons.
<i>What do I want to know?</i>	To establish primary uses. Management decisions can then focus on these categories.	<i>Are there any external motivations?</i>	No.
<i>What is the relationship to the research?</i>	Research objective number one. Examining the Harte Trail as it currently exists.	<i>Are any potential biases affecting this data?</i>	No. Most people provided multiple uses.

Survey Dataset 3 Analysis

<u>Analysis</u>	<u>Dataset 3</u>	<u>Credibility</u>	<u>Dataset 3</u>
<i>What are the data telling me?</i>	The Harte Trail generally meets recreation needs. However, there is room to improve.	<i>Do others agree? Is there corroboration?</i>	24 respondents left comments regarding conflicts between bicyclists and pedestrians on the path. 27 complimented trail maintenance.
<i>What do I want to know?</i>	The current state of recreation on the Harte Trail.	<i>Are there any external motivations?</i>	Improving the trail is the only motivation.
<i>What is the relationship to the research?</i>	Research objectives one and two. If people feel the current system is meeting recreation needs.	<i>Are any potential biases affecting this data?</i>	None that significantly affect the data.

Survey Dataset 4 Analysis

<u>Analysis</u>	<u>Dataset 4</u>	<u>Credibility</u>	<u>Dataset 4</u>
<i>What are the data telling me?</i>	The data are telling me, primarily, that this trail preserves the local culture of Winnipeg. Others believe it aids in connection with the community.	<i>Do others agree? Is there corroboration?</i>	23 people commented on how it preserves local culture. Others were concerned that increasing cultural displays would harm nature. A small number of people referenced a lack of local art.
<i>What do I want to know?</i>	If people feel that the area is representative of local culture. A glimpse into the social sustainability side of the Harte Trail.	<i>Are there any external motivations?</i>	No. Most people advocated for what their ideal trail would look like.
<i>What is the relationship to the research?</i>	Research objectives one and two. Determining if people feel the current system is meeting social needs.	<i>Are any potential biases affecting this data?</i>	Anti-development bias exists in comments. Some people display a bias towards one particular culture.

Survey Dataset 5 Analysis

<i>Analysis</i>	<i>Dataset 5</i>	<i>Credibility</i>	<i>Dataset 5</i>
<i>What are the data telling me?</i>	The data suggests a mix of opinions regarding safety. Many people are scared to use the trail at night due to the lack of lighting and interactions with other people. A portion of users feels unsafe due to pedestrian-cyclist conflicts. A smaller portion of people feel unsafe due to isolation or interacting with wildlife/coyotes.	<i>Do others agree? Is there corroboration?</i>	26 people commented about the lack of lighting. 25 about interactions with other people. 14 about pedestrian-cyclist conflicts. 8 about coyotes and wildlife. 7 about feeling isolated. Many people walking or jogging on the trail do not feel safe. Many females referenced this specifically.
<i>What do I want to know?</i>	This question is concerned with the social aspect of the Harte Trail. If people feel as though their right to safety is being met.	<i>Are there any external motivations?</i>	No. People have a fundamental right to be safe. The urban trail should encourage people to be outdoors.
<i>What is the relationship to the research?</i>	Research objectives one and two. Determining if people feel the current system is meeting safety needs.	<i>Are any potential biases affecting this data?</i>	No bias was noted in this data.

Survey Dataset 6 Analysis

<u>Analysis</u>	<u>Dataset 6</u>	<u>Credibility</u>	<u>Dataset 6</u>
<i>What are the data telling me?</i>	The data gives a mixed opinion regarding enforcement. The people who answered yes offered a few insights into how it works. Many people have noticed many different things. A lack of resources prevents staunch enforcement.	<i>Do others agree? Is there corroboration?</i>	25 people mentioned dog owners breaking rules such as being off-leash or littering. 16 people mentioned cyclists breaking the rules. 11 people noted how a lack of municipal resources prevents enforcement. 10 people observed motorized vehicles on the trail. A small portion noted human interactions such as vandalism or encampments.
<i>What do I want to know?</i>	This question is ultimately concerned with the management of the trail. If people feel the posted rules are adequately enforced or followed.	<i>Are there any external motivations?</i>	Possibly an increase in municipal resources allotted towards enforcement measures on the Harte Trail.
<i>What is the relationship to the research?</i>	Research objectives one and two. Observe the trail management system's current state while also acknowledging some weaknesses.	<i>Are any potential biases affecting this data?</i>	No bias was noticed in this dataset.

Survey Dataset 7 Analysis

<u>Analysis</u>	<u>Dataset 7</u>	<u>Credibility</u>	<u>Dataset 7</u>
<i>What are the data telling me?</i>	The data suggests that year-round maintenance is one of the strengths of the trail system. A substantial majority of respondents approved of its maintenance.	<i>Do others agree? Is there corroboration?</i>	Many people approve of the maintenance system. 11 commented on how plant/weed maintenance could be better in the summer months. A small portion is concerned with snow removal, drainage, and ice.
<i>What do I want to know?</i>	This question is concerned with the management of the trail. If people feel the Trail is adequately maintained throughout the year.	<i>Are there any external motivations?</i>	No. People seem happy with the current system and are not affected by any exterior motives.
<i>What is the relationship to the research?</i>	Observing the current state of the trail management system.	<i>Are any potential biases affecting this data?</i>	No bias was noted in this data.

Survey Dataset 8 Analysis

<u>Analysis</u>	<u>Dataset 8</u>	<u>Credibility</u>	<u>Dataset 8</u>
<i>What are the data telling me?</i>	The data shows that, generally, there are enough waste disposal sites. However, their organization and maintenance could be improved.	<i>Do others agree? Is there corroboration?</i>	25 people commented that there could be more receptacles, with several stating that the eastern portion of the trail needs more. 6 people said cigarette waste was quite prevalent. 4 people commented on dog bag stations. Stating they could increase the number of them or fill the existing ones more frequently. 4 people also thought the existing bins could be emptied more often. Others commented about a lack of recycling bins and a lack of bathrooms.
<i>What do I want to know?</i>	This question again deals with the management of the trail. If enough is being done to dispose of waste sufficiently and conveniently.	<i>Are there any external motivations?</i>	No external motivations were identified. Most people want to dispose of waste conveniently to create a nicer trail.
<i>What is the relationship to the research?</i>	Research objectives one and two. Observing the current state of the trail management system.	<i>Are any potential biases affecting this data?</i>	No bias was noticed in the data.

Survey Dataset 9 Analysis

<u>Analysis</u>	<u>Dataset 9</u>	<u>Credibility</u>	<u>Dataset 9</u>
<i>What are the data telling me?</i>	The data suggests most people feel the trail helps combat the ecological crisis. This suggests that the trail could be valuable in promoting sustainable initiatives, fighting biodiversity loss, or even climate change.	<i>Do others agree? Is there corroboration?</i>	Over 80% of respondents agreed that the trail plays a role in combatting humanity's ecological crisis. Areas like the Harte Trail are a small tool in helping to practice and promote sustainability.
<i>What do I want to know?</i>	This question moves the focus of the survey to the ecological or environmental aspects of the trail. This question aims to establish if a strength of the trail is its ecological value.	<i>Are there any external motivations?</i>	No. People are focused on the long-term preservation of the trail.
<i>What is the relationship to the research?</i>	Research objectives one and two. Primarily determining strengths and weaknesses of the trail system.	<i>Are any potential biases affecting this data?</i>	No comments were left for this question. Potentially biased towards climate change denial in a minimal capacity.

Survey Dataset 10 Analysis

<u>Analysis</u>	<u>Dataset 10</u>	<u>Credibility</u>	<u>Dataset 10</u>
<i>What are the data telling me?</i>	The data showcases that a substantial majority of people believe the trail provides a good space for wildlife. However, concerns exist surrounding human interference with the area's wildlife, as well as new developments significantly reducing habitat and driving wildlife into higher-density areas.	<i>Do others agree? Is there corroboration?</i>	Over 90% of respondents agreed it was a good area for wildlife. 7 people commented about how human interference may disturb the natural behaviours of wildlife. 6 people commented on new developments surrounding the area are reducing biodiversity.
<i>What do I want to know?</i>	Again, this question is meant to assess the ecological value of the trail.	<i>Are there any external motivations?</i>	Perhaps to stop new developments from being built in the area.
<i>What is the relationship to the research?</i>	Research objectives one and two. Primarily determining strengths and weaknesses of the trail system.	<i>Are any potential biases affecting this data?</i>	A slight anti-development bias again exists in the data to a minuscule extent.

Survey Dataset 11 Analysis

<u>Analysis</u>	<u>Dataset 11</u>	<u>Credibility</u>	<u>Dataset 11</u>
<i>What are the data telling me?</i>	The data again presents a mix of opinions regarding the amount of replanting initiatives on the trail.	<i>Do others agree? Is there corroboration?</i>	No comments were left for this question. Roughly 65% of respondents felt an appropriate level of replanting occurred, while roughly 35% did not.
<i>What do I want to know?</i>	How people feel about environmental management practices going on with the trail. If they feel the general level of stewardship is sufficient.	<i>Are there any external motivations?</i>	No. Again this question is just gauging the opinions of trail users and concerned citizens.
<i>What is the relationship to the research?</i>	Research objectives one and two. Primarily determining strengths and weaknesses of the trail system.	<i>Are any potential biases affecting this data?</i>	No comments were left. No bias was identified.

Survey Dataset 12 Analysis

<u>Analysis</u>	<u>Dataset 12</u>	<u>Credibility</u>	<u>Dataset 12</u>
<i>What are the data telling me?</i>	The data is again showcasing a mix of opinions. Many people needed clarification or to be made aware of practices focused strictly on invasive species management.	<i>Do others agree? Is there corroboration?</i>	A large mix of opinions was seen in this question. 25 people commented that they are unaware of invasive species management practices or did not know how to answer the question adequately. 5 people felt that there was inaction toward invasive species. 4 people commented that the response's scope was inappropriate, specifically citing invasive weeds in the surrounding ditches and forest. 3 people commented on a lack of resources for monitoring this issue.
<i>What do I want to know?</i>	Once more, this question focuses on environmental management practices on the trail. Exploring if the level of stewardship is sufficient to support biodiversity.	<i>Are there any external motivations?</i>	Possibly an increase in municipal resources allotted towards invasive species management on the Harte Trail.
<i>What is the relationship to the research?</i>	Research objectives one and two. Primarily determining strengths and weaknesses of the trail system.	<i>Are any potential biases affecting this data?</i>	Some anti-government bias was noted here. Some comments directly criticise the municipal government.

Survey Dataset 13 Analysis

<u>Analysis</u>	<u>Dataset 13</u>	<u>Credibility</u>	<u>Dataset 13</u>
<i>What are the data telling me?</i>	The data offers a mix of ideas, but most people love the trail and want to see it function in the best way possible. The most common theme is that people are concerned that development harms biodiversity. The other major themes are conflicts between cyclists and pedestrians and certain people feeling unsafe using the trail between dusk and dawn.	<i>Do others agree? Is there corroboration?</i>	This optional question solicited 69 responses. 14 people were concerned about decreasing levels of biodiversity. 10 people were concerned with cyclist-pedestrian conflicts. 7 people were concerned with safety and advocated for lights. 5 people wanted more enforcement of rules, such as littering or using motorized vehicles. 5 people wanted more conveniently placed amenities like benches, garbage cans, or bathrooms. 4 people stated that connectivity could improve, particularly on the western portion near the perimeter. 4 people would like to see the trail widened. A small extent of people wants more volunteerism and educational initiatives on the trail, or to remove it altogether.
<i>What do I want to know?</i>	What do people feel are the most important aspects of the trail, and what can be improved to make the system operate better?	<i>Are there any external motivations?</i>	Some people believe its existence impedes their property rights. Other than that, not too much. Most respondents love it and want it to flourish by offering ideas they see as the best fit.
<i>What is the relationship to the research?</i>	Research objectives one and two. Primarily determining strengths and weaknesses of the trail system. It works to identify areas where regenerative design may serve impactful.	<i>Are any potential biases affecting this data?</i>	Some bias regarding development. Other than that, only a little. Most people provided sound reasoning for their answers.

**Appendix H.**

*Key Informant Interview Analyses Tables*

*Interview Dataset 1 Analysis*

<u>Analysis</u>	<u>Dataset 1</u>	<u>Credibility</u>	<u>Dataset 1</u>
<i>What are the data telling me?</i>	The data firmly confirms that the trail is essential to the community. Each respondent answered yes to this question. The main benefits identified are connectivity to other city areas or different trail systems, a convenient connection to nature, and the ability to participate in active transport for community members.	<i>Do others agree? Is there corroboration?</i>	Yes, all respondents concurred. 3 cited connectivity as the driving critical feature, while 3 others cited an easy way to connect to nature. 2 comments surrounded the ability it creates to participate in active transport. Other comments were left regarding a sense of community, recreational activities, and high daily use rates.
<i>What do I want to know?</i>	This opening question was meant to assess if the Harte Trail was worth saving and improving. It helped identify key features of the trail that the community benefits from.	<i>Are there any external motivations?</i>	None were identified in this question. Respondents showcased what makes the trail essential to the community in their expert opinions.
<i>What is the relationship to the research?</i>	This question was primarily related to research objectives one and two. It examined the current state of the trail, while also identifying some strengths of the system.	<i>Are any potential biases affecting this data?</i>	No bias was identified. Most people gave straightforward answers and didn't display any underlying prejudice against one particular idea.

*Note. Identified strengths:* connectivity, connection to nature, and active transport.

*Interview Dataset 2 Analysis*

<u>Analysis</u>	<u>Dataset 2</u>	<u>Credibility</u>	<u>Dataset 2</u>
<i>What are the data telling me?</i>	<p>This question showcased a mix of answers. Respondents generally agreed that it meets certain types of recreational needs for people. It is a well-maintained trail that provides a safe space away from motor vehicles and is accessible to people of all capabilities. There are no significant barriers for people with disabilities from using the trail (once they are on it). Where the trail seems to fall short is having accessible entry points to the northern part of Charleswood, as well as a connection to the trail system on the other side of the perimeter highway. The lack of safe connection points, getting to or exiting from the Harte Trail, is a barrier to recreational participation.</p>	<p><i>Do others agree? Is there corroboration?</i></p>	<p>Two respondents gave unequivocal yes answers, while four gave yes and no answers. The general opinion was that once you are on the trail, it does a good job of providing a safe and easily traversable space for people to participate in recreation. While providing safer connections to the north side of the Charleswood community and to the Headingley Grand Trunk Trail across the perimeter highway on the western side could improve recreational participation.</p>
<i>What do I want to know?</i>	<p>This question focuses on the recreational aspects</p>	<p><i>Are there any external motivations?</i></p>	<p>No real exterior benefits exist to respondents from answering this question.</p>

	of the Harte Trail. It is meant to identify recreational strengths and barriers existing in its system.		
<i>What is the relationship to the research?</i>	This question relates to all three research objectives. It evaluates the current recreational state of the trail by examining its strengths and weaknesses and finds ideas where regenerative design may be a helpful tool to address.	<i>Are any potential biases affecting this data?</i>	Possibly. Some respondents are in charge of making recreational decisions for the trail. They may have been apprehensive about critiquing their own ideas or the ideas of their colleagues.

*Note. Identified strengths:* safe place away from vehicles, easily traversable and accessible to people of all types.

**Identified barriers:** poor connection to northern Charleswood and west of the perimeter highway.

*Interview Dataset 3 Analysis*

<u>Analysis</u>	<u>Dataset 3</u>	<u>Credibility</u>	<u>Dataset 3</u>
<i>What are the data telling me?</i>	The data suggests that the trail does a good job of promoting the culture of the community. For example, it does a good job showcasing the history of the trail while also fostering an urban connection to nature that many people value. The trail's social benefit could improve by incorporating some Indigenous input into its design.	<i>Do others agree? Is there corroboration?</i>	4 respondents stated yes, 1 respondent stated somewhat, and 1 respondent thought it could be improved. 2 respondents specifically cited that it does a good job promoting nature, which is culturally significant to many people. 2 people also cited that it does a good job showcasing the history of the community, as the trail contains plaques commemorating the former rail bed. 1 respondent thought it could do a much better job showcasing local indigenous cultures or history in the area.
<i>What do I want to know?</i>	This question is meant to assess some of the social aspects of the trail system. It helps determine if the trail functions in a socially proficient manner.	<i>Are there any external motivations?</i>	No. Nobody stands to benefit in any unjust way or manner by stating their thoughts on the culture present on the Harte Trail.
<i>What is the relationship to the research?</i>	Again, this question relates to all three research objectives. It evaluates the current social state of the trail by examining its cultural strengths and weaknesses. It aims to find if any regenerative ideas exist in this instance.	<i>Are any potential biases affecting this data?</i>	With any question pertaining to culture, the potential for bias exists. It is entirely possible that respondents may have had a preference toward one particular viewpoint or culture and overlooked other important aspects.

*Note. Identified strengths:* does a good job promoting the local history of the Charleswood community, and promotes a connection with nature that many people value.

**Identified barriers:** a lack of indigenous input relating to the historical or traditional uses of the land.

*Interview Dataset 4 Analysis*

<u>Analysis</u>	<u>Dataset 4</u>	<u>Credibility</u>	<u>Dataset 4</u>
<p><i>What are the data telling me?</i></p>	<p>The data suggests that the Harte Trail is commonly used for active transportation; however, it may not be the best-suited area for this to occur. It is essential for the promotion of active transport in the Charleswood area. It is a safer space than regional roads such as Wilkes, Roblin, or Grant avenues for active transport. However, the trail is highly naturalized, where width and visibility concerns commonly create conflicts between cyclist and pedestrian traffic. Additionally, a lack of connection on the western edge to the Headingley Grand Trunk Trail creates a barrier to use for those living or commuting west of Winnipeg. Informants suggested creating a separate crossing across the perimeter highway, and a complimentary system dedicated specifically to active transportation using existing road infrastructure on the adjacent residential streets.</p>	<p><i>Do others agree? Is there corroboration?</i></p>	<p>2 respondents specifically mentioned a lack of connection to other trail systems on the western edge as an issue, while 2 others mentioned conflicts between cyclists and pedestrians. 5 agreed that it does promote active transportation, especially in Charleswood. 1 respondent thought it was not the best idea to actively promote the trail as an active transportation route due to the risk of exacerbating existing issues.</p>

<i>What do I want to know?</i>	This question focuses on assessing the Harte Trail as a tool for active transportation in Winnipeg. Determines if the trail is a good fit for active transportation.	<i>Are there any external motivations?</i>	Perhaps extra municipal resources allocated to the Harte Trail and its surrounding streets to better meet active transportation needs of the area.
<i>What is the relationship to the research?</i>	Again, this question relates to all three research objectives. It evaluates the current state of active transportation by determining strengths and weaknesses. Several regenerative ideas were mentioned by key informants.	<i>Are any potential biases affecting this data?</i>	No bias was detected in the data. Respondents relayed issues they have seen arise on the trail while providing some idea of how to improve its function.

*Note.* **Identified strengths:** safer than large regional roads, essential for active transport in the Charleswood community.

**Identified barriers:** conflicts between pedestrians and cyclists and the trail, lack of a safe connection to the Headingley Grand Trunk trail on the western edge.

*Interview Dataset 5 Analysis*

<u>Analysis</u>	<u>Dataset 5</u>	<u>Credibility</u>	<u>Dataset 5</u>
<i>What are the data telling me?</i>	<p>The data suggests that the Harte Trail management system typically does a good job of preserving biodiversity in its area. Respondents mentioned how replanting initiatives are plentiful in the area and that species selections are typically native to the area and work to promote functioning ecosystem dynamics. This is seen through the establishment of butterfly gardens or the fact that trees are grown from seed, which has been harvested in the adjacent Assiniboine Forest and replanted along the trail. One area that could be improved is collaboration between decision-makers, property owners, and scientists. The trail runs through an ecologically diverse area containing forest, marshes, and grassland. This supports many bird, frog, and mammal species. Respondents mentioned how there could be better communication between stakeholder groups to provide a well-defined method of biological preservation of specific species contained within the ecosystems.</p>	<p><i>Do others agree? Is there corroboration?</i></p>	<p>4 respondents mentioned how replanting initiatives were a strength of the system while simultaneously providing information on how. Noxious weed removal was also mentioned as a method of biological preservation. 2 respondents mentioned how diverse the area is while also showcasing some concern regarding its preservation. 2 respondents stated that the trail management system could have better collaboration between stakeholder groups to identify key areas of preservation and develop agreed on methods to preserve them.</p>

<i>What do I want to know?</i>	This question is focused on the ecological value of the Harte Trail. Evaluating how biodiversity in the area is managed, and how it could potentially be improved.	<i>Are there any external motivations?</i>	No. Most respondents are motivated by preserving biodiversity for the benefits it has to all.
<i>What is the relationship to the research?</i>	Again, this question relates to all three research objectives. It evaluates the current state of biological preservation on the trail by determining the strengths and weaknesses of the current system. One main regenerative idea was mentioned by key informants.	<i>Are any potential biases affecting this data?</i>	Perhaps some slight anti-development bias in one response. Mostly none were identified. Most respondents just talked about methods of preservation and the reasoning behind their answers.

*Note.* **Identified strengths:** replanting of native species which aid in ecosystem functioning.

**Identified barriers:** lack of communication/defined roles and methods aimed at preservation of specific species within adjacent ecosystem.

*Interview Dataset 6 Analysis*

<u>Analysis</u>	<u>Dataset 6</u>	<u>Credibility</u>	<u>Dataset 6</u>
<p><i>What are the data telling me?</i></p>	<p>The data suggests that there historically have been some environmental education initiatives on the trail; however, they are not consistent, and the opportunity for more or enhanced initiatives exists. In the past, there have been ‘Trails Day’ presentations where key informants have presented on the ecology, such as birds and frogs, existing on the trail. Another initiative is tree planting. Key stakeholders have worked together to plant native species and during this opportunity, have been able to educate children on aspects of tree planting and species selection. Another area identified was signage. Some signage exists on the trail, however, an opportunity to improve this exists. Signage may be enhanced to provide information on ecosystem functioning and important species within the surrounding ecosystem. A major opportunity exists for partnerships with other organizations to utilize the Harte Trail as a valuable tool for environmental education. Several local schools are located within a close proximity to the trail. Stakeholders working with these schools to coordinate events such as nature walks will help students reap the benefits associated with</p>	<p><i>Do others agree? Is there corroboration?</i></p>	<p>3 respondents were unaware of any environmental education occurring on the trail, while 3 presented some ideas of initiatives that have happened or happen somewhat regularly. 3 respondents referenced the opportunity for partnerships with other organizations, while 3 more spoke of the potential for increased signage. 2 respondents spoke positively of the ongoing tree planting initiatives, while 1 spoke on the benefits of past trails day presentations.</p>

	environmental education. Additionally, the Harte Trail is close to ecologically significant areas such as Fort Whyte, Assiniboine Park, and Beaudy Provincial Park. Coordinating with organizations in charge of these areas may help promote shared educational goals and values within the community.		
<i>What do I want to know?</i>	This question focuses on the value of the Harte Trail as a tool for environmental education. Searching for current opportunities while also looking for potential areas of improvement.	<i>Are there any external motivations?</i>	No respondents stand to benefit from these answers.
<i>What is the relationship to the research?</i>	This question looks at all 3 research objectives, but the data is primarily related to research objective 3. Respondents offered good ideas for a regenerative system that could greatly benefit environmental education.	<i>Are any potential biases affecting this data?</i>	No bias was detected in this data. The answers were straightforward and informative, with sound reasoning.

*Note.* **Identified strengths:** education that occurs during tree planting, some existing signage.

**Identified barriers:** lack of partnerships with other organizations, enhanced/site-specific signage.

*Interview Dataset 7 Analysis*

<u>Analysis</u>	<u>Dataset 7</u>	<u>Credibility</u>	<u>Dataset 7</u>
<i>What are the data telling me?</i>	The data suggests that maintenance of the Harte Trail is one of the strengths the trail possesses. In the past few years, respondents have seen drastic improvements to the maintenance of the trail. Plowing occurs in the winter, and a green team looks after the area to remove weeds and litter during the summertime. Some areas of improvement could be more overhead pruning, which would reduce user risks and aid in the ease of plowing. Responses demonstrate that the Harte Trail has much better maintenance than other trail systems within Winnipeg.	<i>Do others agree? Is there corroboration?</i>	All 6 respondents agreed that, generally, the Harte Trail is adequately maintained. 2 responses stated that removal of weeds and overhead vegetation could be improved; however, that seems to be a minor critique. 2 respondents mentioned the success of snow plowing, and 2 other respondents mentioned how helpful the green team has been during summer.
<i>What do I want to know?</i>	This question focuses on the maintenance of the Harte Trail. It aims to evaluate how it is currently maintained while also searching for areas of improvement.	<i>Are there any external motivations?</i>	No exterior benefits are derived from answering this question.
<i>What is the relationship to the research?</i>	Relates to all 3 research objectives. Quite pertinent to research objective 2. Data showcases that maintenance is a major strength of the current system surrounding the Harte Trail.	<i>Are any potential biases affecting this data?</i>	Possibly. Some respondents are in charge of maintaining the trail. They may have been apprehensive about critiquing their ideas or the ideas of their colleagues. However, this is mitigated because all 6 respondents agreed it is adequately maintained.

*Note. Identified strengths:* maintenance of the trail system in general, is a strength. Specifically, the use of a green team in the summer months and proficient snow removal in the winter.

**Identified barriers:** Focusing on pruning overhead branches and weed removal may aid in snow removal and help the green team operate more efficiently during summer.

*Interview Dataset 8 Analysis*

<u><i>Analysis</i></u>	<u><i>Dataset 8</i></u>	<u><i>Credibility</i></u>	<u><i>Dataset 8</i></u>
<i>What are the data telling me?</i>	<p>The data suggests that currently, there is some level of collaboration between stakeholders, however, there is an opportunity to improve this. Following the development of houses on the southern side of the trail, the collaboration between groups has been improving. The City of Winnipeg is ultimately responsible for making decisions; typically, other groups will consult with them to coordinate initiatives on the trail. Working together with the community and other levels of government has been successful in implementing current initiatives like tree planting and funding. An area of improvement exists in the domain of communication. Sometimes the public or stakeholder groups will make decisions without properly consulting other groups. Enhancing the opportunity for members of the public to voice their concerns could help improve the management of the trail. Ideas for this exist in developing an annual or bi-annual meeting where people can speak to decision-makers and have their ideas considered. Additionally, developing an agreed management plan to help define roles and processes may clarify people's confusion about management on the trail.</p>	<i>Do others agree? Is there corroboration?</i>	<p>All respondents agree that there is some level of collaborative decision-making on the trail. 4 respondents believe that this level of collaboration could be improved. Incorporating members of the public who are unaffiliated with any particular stakeholder group seems to be an area of particular interest; this was referenced by 2 respondents. 2 respondents stated an idea for a plan or regular meetings as a potential tool for improving collaboration. 2 respondents thought the current system was sufficient for collaborating on decisions regarding the Harte Trail.</p>
<i>What do I want to know?</i>	<p>This question concerns the decision-making process that affects the management of the Harte Trail. It aims to evaluate the</p>	<i>Are there any external motivations?</i>	<p>No exterior benefits are derived from answering this particular question.</p>

	level of collaboration between groups regarding decisions.		
<i>What is the relationship to the research?</i>	Focuses on all 3 research objectives with a particular tie to objective 3. Respondents offered some regenerative ideas to improve the collaborative function.	<i>Are any potential biases affecting this data?</i>	None identified. Respondents are involved in this process; however, improving it stands to benefit everyone.

*Note. Identified strengths:* collaboration has improved in recent years. Stakeholders are receptive to ideas produced by others and work to aid the process.

**Identified barriers:** an opportunity to engage more stakeholders such as the public. Developing a management plan or holding regularly scheduled meetings may eliminate some confusion.

Interview Dataset 9 Analysis

<u>Analysis</u>	<u>Dataset 9</u>	<u>Credibility</u>	<u>Dataset 9</u>
<i>What are the data telling me?</i>	The data presents a mixed opinion regarding monitoring on the Harte Trail. Monitoring efforts are largely user-based, meaning stakeholders rely on trail users to report issues and then attempt to rectify them in the best manner possible. Users can report issues through Friends of the Harte Trail, Manitoba Trails, or the City of Winnipeg. Respondents referenced that this generally works well, as there is solid communication between these three groups. Budgetary and time constraints prevent staunch enforcement tactics from being used specific to the Harte Trail. Cycling count data has been collected for the trail, and decision-makers are currently contemplating how to utilize this information best. The largest issue facing the trail is conflicts between cyclists and pedestrians. People who use the trail strictly as an active transportation corridor often forget that many pedestrians use the trail for recreational activities. This multi-use feature of the trail often causes safety concerns for users, which decision-makers are struggling to address adequately. An additional issue is property owners adjacent to the trail creating secondary paths from their fence line to the Harte Trail, which jeopardizes the ecology and natural state of the trail. The lack of a clear management plan may work against developing clear procedures to solve these issues. Increasing educational initiatives was one idea existing in the data which may help inform more users of trail rules and regulations.	<i>Do others agree? Is there corroborati on?</i>	3 respondents believed the level of monitoring was sufficient given the current system. 3 other respondents gave a mixed opinion and spoke about some continuing issues. 2 specifically referenced issues between cyclists and pedestrians, while 1 spoke about secondary paths onto the trail. Solid communication between stakeholders was referenced 3 times. 3 respondents offered some regenerative ideas, such as educational initiatives and developing a clear plan to help address some of the existing issues.
<i>What do I</i>	This question focuses on monitoring	<i>Are there</i>	Nobody stands to benefit from

<i>want to know?</i>	issues that arise on the Harte Trail. It is meant to assess if the monitoring system is sufficient and if any tactics exist to improve it.	<i>any external motivations?</i>	this information unjustly.
<i>What is the relationship to the research?</i>	This question focuses on all three research objectives. It is closely tied to objectives one and two, which assess the system's current state, and searches for strengths and weaknesses. Some regenerative ideas were also derived from the data.	<i>Are any potential biases affecting this data?</i>	None were identified in this data. Comments were made about the system based on the knowledge of each respondent.

*Note.* **Identified strengths:** user-based system with several outlets to report issues. Solid communication between stakeholder groups.

**Identified barriers:** Budgetary constraints prevent staunch enforcement measures. The lack of a clear management plan creates confusion on how to address continuing issues best.

*Interview Dataset 10 Analysis*

<u><i>Analysis</i></u>	<u><i>Dataset 10</i></u>	<u><i>Credibility</i></u>	<u><i>Dataset 10</i></u>
<i>What is are data telling me?</i>	The data provides several well-established key strengths of the Harte Trail system, with many independent key weaknesses supported by other datasets within this analysis. Key strengths are supporting a connection to nature, connectivity to other trail systems within Winnipeg, and a well-maintained trail that promotes community use. The key weak points of the trail are seen in the lack of safe connection across the perimeter highway, poor connectivity to parts of northern Charleswood, continual conflicts between cyclists and pedestrians, dumping and littering on parts of the trail, and the need for more community or volunteer involvement in helping to manage the trail in the best way possible.	<i>Do others agree? Is there corroboration?</i>	Many respondents agreed on the fundamentals of the trail that work. 4 stated how it fosters a connection to nature. 2 stated how it connects well to other parts of trail systems in Winnipeg, while 3 more stated how it is extremely well maintained and is a great place for the community to engage with each other. Most respondents had different ideas for what they consider the most prevalent concerns facing the trail. 2 agreed that the largest issue is the lack of a safe connection across the perimeter highway. Others advocated for safer connections to parts of northern Charleswood, combating cyclist-pedestrian conflicts, stopping illegal dumping/littering, and more community/volunteer involvement in managing the trail.
<i>What do I want to know?</i>	This question is meant to obtain information on what the informants believe are the strongest and weakest features of the Harte Trail system.	<i>Are there any external motivations?</i>	Nobody stands to benefit unjustly. All will benefit by creating a safe and efficient trail system.
<i>What is the relationship to the</i>	This question focuses solely on research objective number 2. It asks respondents to supply what they feel are the greatest	<i>Are any potential biases</i>	No bias was detected. Each has their own idea of the strengths and

<i>research?</i>	strengths of the trail and what its greatest weaknesses are.	<i>affecting this data?</i>	weaknesses of the system based on their expert knowledge.
------------------	--	-----------------------------	---

*Note.* **Identified strengths:** connection to nature, connectivity to areas within Winnipeg, and trail maintenance.

**Identified barriers:** the lack of safe connection across the perimeter highway, poor connectivity to parts of northern Charleswood, continual conflicts between cyclists and pedestrians, dumping and littering on parts of the trail, and the need for more community or volunteer involvement.