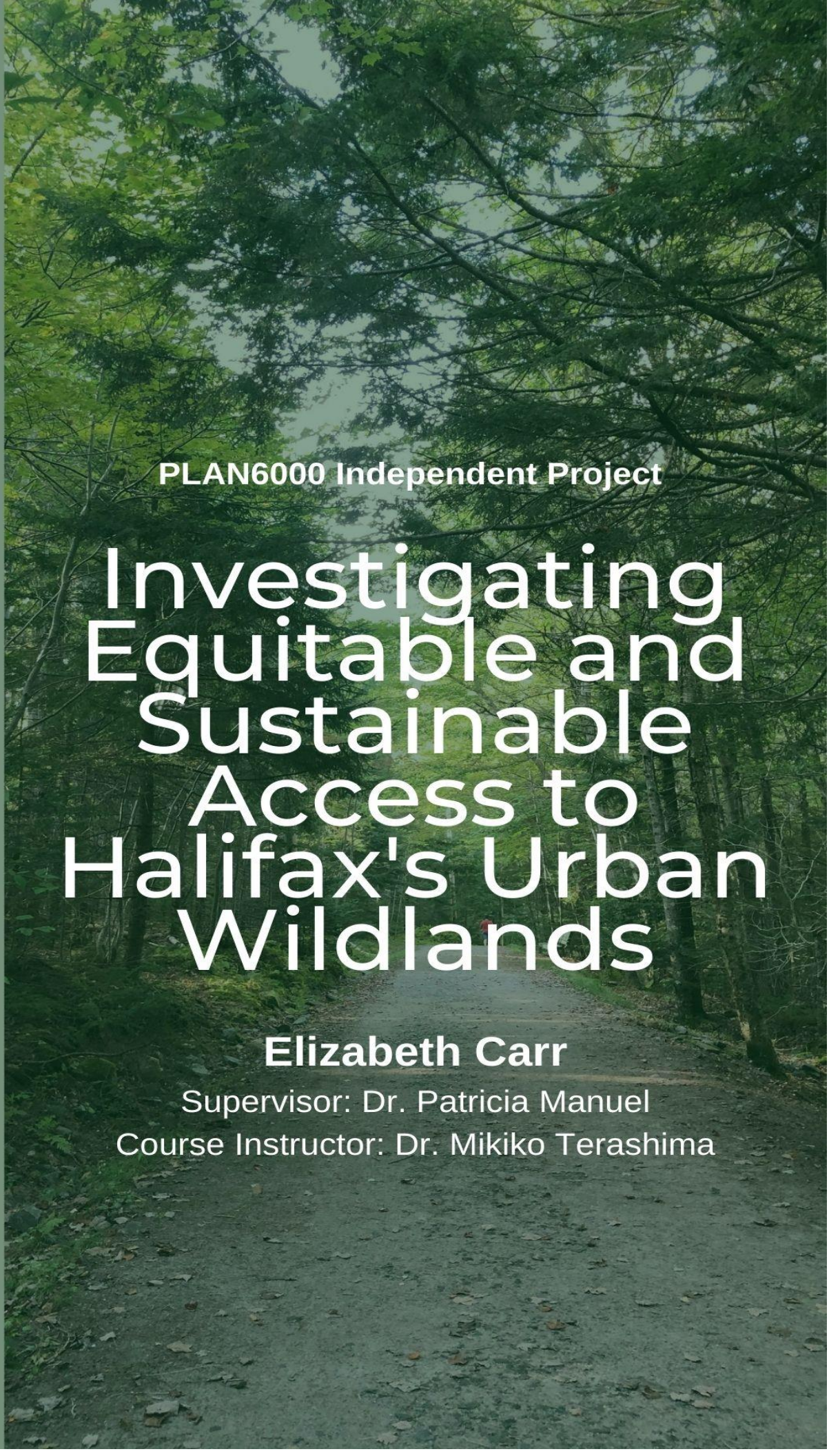

PLAN6000 Independent Project

Investigating Equitable and Sustainable Access to Halifax's Urban Wildlands

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Acknowledgments

I would like to thank my supervisor Dr. Patricia Manuel for her dedication and guidance throughout the duration of my research project. I would also like to thank the participants of the workshops I conducted as part of my project as without their eagerness to participate and extensive knowledge, this project would not have been nearly as successful.

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Executive Summary

The topic of my research project is equitable and sustainable access to urban wildland parks in the Halifax Regional Municipality (HRM). Three parks were selected as study areas for the project including Blue Mountain-Birch Cove Lakes, Sandy Lake-Sackville River Regional Park, and the Shaw Wilderness Park. Investigating urban wildland access is a relevant topic due to the influx in people interested in getting outside and enjoying wilderness experiences since the beginning of the COVID-19 pandemic. My project will look at how accessible the three selected parks are for neighbouring communities and whether there are barriers that can be addressed from a planning perspective.

The purpose of my research is to determine whether access to the three parks is equitable, in that many different groups of people have access, while also being sustainable, meaning that access to the parks causes minimal environmental damage and can be maintained into the future. All three of the selected parks are located near or on bus routes, have varying levels of bike lane access, and are surrounded by residential developments. For each park, a site analysis, workshop, spatial analysis of access, and social vulnerability analysis was conducted. The site and spatial analyses of access resulted in maps of each park that included bus routes, bike lanes, park entry points, and areas of interest within the park. Workshops were conducted with representatives from stewardship groups associated with each park and were used to collect information on areas of interest as well as on ecology and the history of the parks. Finally, a social vulnerability analysis highlighted equity-related barriers to access for the neighbourhoods in proximity to each park.

From the site analyses, spatial analyses of access, and workshops I was able to pinpoint several marked and unmarked entry points and areas of interest for each park. Information about the unmarked entry points and areas of interest within the parks were difficult to find online, which made the workshops I conducted with park representatives extremely valuable. The social vulnerability analysis revealed that there is a mixture of socioeconomic statuses, ethnicities, and housing situations in the communities surrounding the three parks, which indicated that the parks already have some level of equitable access. Participants of the workshops brought up several sustainability issues around urban wildland park access including the limitations of public transportation as well as the lack of entry points to the parks.

Recommendations for increasing urban wildland park access included improving public transit and active transportation infrastructure around the parks, implementing more entry points around the perimeter of the parks, and creating education campaigns on the ecological significance of the three parks. Future research on who uses the parks, what areas would be

most affected by increased use, and how to navigate mixed landownership is required for a more complete understanding on how to create equitable and sustainable access to urban wildland areas.

1.0 Introduction

My research is focused on assessing the equitability and sustainability of access to urban wildland parks in Halifax, Nova Scotia. Urban wildlands are categorized by their proximity to urban centres and their undeveloped, wilderness landscapes. Three parks in Halifax were selected as study areas for my research including Blue Mountain-Birch Cove Lakes, Sandy Lake-Sackville River Regional Park, and the Shaw Wilderness Park. All three areas are valued for their proximity to the city of Halifax and their lack of urbanization or 'wild' nature. Access to nature is important for urban communities because it provides opportunities to connect with nature and to participate in physical activity. With the ongoing COVID-19 pandemic, it is crucial that residents of urban centres have convenient access to outdoor spaces especially when there is evidence to suggest that people who have access to green space experience better mental and physical health outcomes (Ontario Professional Planners Institute, 2018).

Park access is a planning issue because of the impact it can have on overall health and wellbeing. Urban wildland park access must also be balanced with conservation to establish continued enjoyment of wilderness areas for future generations. All three of the parks I have included in my research are designated regional parks within the Halifax Regional Municipality, but they do not all received the same level of attention as other regional parks within the municipality. Several local advocacy groups have created literature and maps that detail the interesting areas and ecological significance of the parks. Though there have been discussions about access to urban wildland parks among local advocacy groups, an in-depth review of the features in and around the parks is needed to better understand the gaps in access that exist. There is not a lot of existing information on how planning interventions can help improve equitable access to urban wildland areas while protecting their ecological integrity. Through my research, I have attempted to answer the question *how equitable and sustainable is access to the three selected parks, and how, if at all, can access be improved so more residents of Halifax can enjoy the parks?*

2.0 Purpose

The purpose of my research was to investigate whether access to the three selected parks was equitable and sustainable. Equitable access was categorized by the types of public transportation available around the parks and how convenient access to the parks was for nearby communities. The socioeconomic status of communities in proximity to the three parks have been explored through a social vulnerability analysis that considered four different deprivation factors from the Canadian Index of Multiple Deprivation (CIMD). Sustainability will be categorized by the types of public transportation most often used by visitors to the parks, and the infrastructure that exists for both active transportation and public transit. Physical accessibility, meaning access that is available for people of all abilities, was outside the scope of my research and will not be discussed within this report.

3.0 Research Questions

3.1 Overarching Research Question

1. How equitable and sustainable is access to Halifax's urban wildland parks?

3.2 Sub-questions

1. What transportation routes are available near park entry points e.g., bus routes, bike routes, walking paths, and how equitable and sustainable are the available transportation options?
2. Where are entry points to the three study areas located, and how accessible are the entry points via transportation routes?
3. Where are areas of interest such as look-offs, lakes, etc., within the parks, and are the areas of interest navigable from the entry points?

4.0 Goals and Objectives

The goal of my research was to examine the spatial relationship between the communities in proximity to the parks and the infrastructural features that facilitate access to the parks to determine if access is equitable and sustainable. To accomplish my goals, I conducted workshops with members of local park stewardship groups to collect information on existing public transit options, active transportation options, parking options, number and location of entry points, and types of interesting areas within the parks that provide for an interesting and enjoyable experience of wild nature. I then created maps using ArcGIS Pro software to illustrate the location of important features. A social vulnerability analysis also revealed information about the communities around the three parks, which helped assess whether access is equitable.

5.0 Literature Review

5.1 Literature Acquisition

A review of the literature in early 2021 uncovered a limited number of sources on urban wildland access leaving significant gaps in the knowledge around creating access that is both equitable and sustainable. I began my search for relevant literature by utilizing resources provided by Dalhousie University's libraries including the EBSCO and Novanet databases. I searched terms such as *urban wildland, urban wilderness, wilderness access, wilderness conservation*, *planning and park access,* and *planning and wilderness parks*, among other terms to determine what types of strategies existed for improving wilderness park access. My initial searches yielded a variety of reports on topics loosely related to wilderness areas such as the impact wildfires have on nearby urban areas, but very few reports directly addressed park access. After narrowing my search terms to only include reports on accessing urban wildland areas, I found a limited number of reports on how community engagement has been successfully used to improve local knowledge on the effect humans have on wilderness habitats and the importance of wilderness conservation. Even more limited was the number of papers discussing the best ways to develop wilderness areas to make them more accessible without compromising their ecological integrity.

5.2 Findings

Most of the available literature described the benefits of having access to wilderness areas including how convenient park access can improve physical and mental health outcomes

while providing a space for communities to gather and connect socially (Dean et al., 2019; Hester et al.,1999; Montambault et al., 2018). Some authors mentioned that having access to parks and greenspace encouraged more people to become invested in the conservation of natural spaces (Dean et al., 2019; Hester et al.,1999; Montambault et al., 2018). Some techniques for improving awareness of urban wilderness areas included the promotion of ecotourism and the implementation of community educational programming (Halifax Regional Municipality, 2018). However, other authors argued that attracting attention to wilderness areas could lead to further environmental damage (McCool, 2009 & Saarinen, 2016). A lack of consensus on the access issue was prevalent throughout the literature.

Common themes within the literature included the benefits of community consultation and engagement for bringing awareness to the importance of urban wildland access and conservation (Dean et al., 2019; Ecology Action Centre, 2019; Hester et al.,1999; Montambault et al., 2018; Noss, 2003; Saarinen, 2016; Sharpe & Conrad, 2006). Research involving community consultation helped improve the participant's ability to make connections with nature, which in turn led to more people being interested in conservation efforts associated with the parks. Another commonly discussed topic included limiting access to parks or 'gatekeeping' wilderness parks as a form of conservation (Dean et al., 2019 & Hester et al., 1999). The consensus on gatekeeping was that it was unnecessary and was not any more effective at promoting conservation within wilderness parks than other methods (Dean et al., 2019 & Hester et al., 1999). Most authors agreed that finding ways to facilitate nature experiences for a wider population was a goal of their research, but that increased access to wilderness areas must be paired with sufficient conservation efforts (Hester et al., 1999 & McCool, 2009; Noss, 2003). A related theme that has recently emerged in the urban wildland literature is how the COVID-19 pandemic has impacted people's connection to nature and has led to increased motivation for people to seek out nature experiences.

COVID-19 significantly affected the way people interact with nature (Soga et al., 2021). At the beginning of the pandemic, parks and other public outdoor spaces around the world were closed to prevent the spread of COVID-19 (CTV News, 2020). For people who lived in apartments in an urban setting, the closure of parks severely restricted their ability to take part in physical activity and to interact with nature (Soga et al., 2021). A lack of access to nature is concerning as there is ample research showing the correlation between people who have regular access to green space and positive mental and physical health outcomes (Ontario Professional Planners Institute, 2018). Most cities quickly reopened their parks because there was insufficient evidence to suggest that park closures were the most effective measure to

prevent the spread of COVID-19. When the parks reopened, there was a massive influx in people taking advantage of the outdoor spaces available to them as it was one of the safest options for physical activity and social interaction. Working with the growing interest in nature brought on by the ongoing pandemic, we can improve access to parks to offer nature experiences to more people living in urban settings.

5.3 Gaps in the Literature

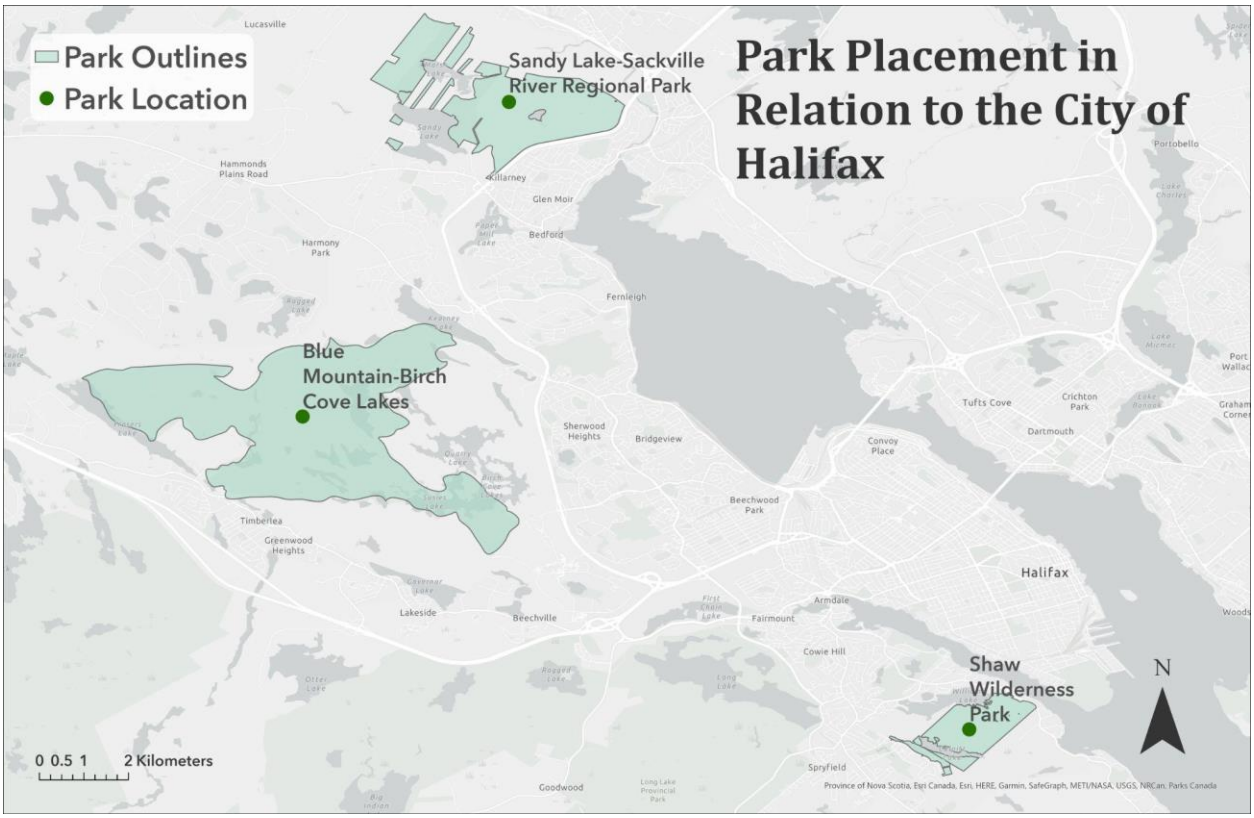
The main gap that exists for urban wildland research is a general lack of knowledge on how best to encourage equitable access to urban wildland areas while maintaining the ecological integrity of the landscape. In the context of Halifax, there is also a lack of attention around the development and conservation of urban wildland areas, causing several local organizations to advocate for ecologically sensitive areas on their own (Ecology Action Centre, 2020 & Nova Scotia Nature Trust, 2021). Furthermore, urban wildland conservation is not a priority of the local government, and an incentive is often required to bring attention to the issue of wilderness conservation. Getting support from local government officials is needed to be successful when advocating for the preservation or expansion of wilderness areas (Dean et al., 2019). Though there is limited knowledge on how to manage park access, there are some examples in the literature of how different cities have addressed sustainable access to urban wildland parks. However, a new concept in this line of research is how we improve access so more people within urban areas can access wilderness nature experiences.

My research contributes to the body of knowledge on urban wildland access by investigating the types of transportation options that exist and the number and location of entrances as well as analyzing the sociodemographic characteristics of the communities surrounding the selected parks. The three parks I chose to include in my research are surrounded by development and communities of varying socioeconomic status. A novel aspect of my research included looking at the connections that exist between communities surrounding the parks and the transportations options and entry points that facilitate access to the parks. By analyzing access networks to existing urban wildlands areas, planners can gain an understanding of barriers to access, and can use that information to implement the appropriate infrastructure to resolve inequity in park access. My project serves as a starting point for more comprehensive urban wildland research and could secure Halifax as a leader for providing opportunities for equitable and sustainable access to urban wildland parks.

6.0 Park Background

6.1 Context Map

Figure 1. Map showcasing the placement of the three selected parks in relation to downtown Halifax.



6.2 Blue Mountain-Birch Cove Lakes

Blue Mountain-Birch Cove Lakes is located between the communities of Hammonds Plains, Timberlea, and Halifax and is made up of around 5000 acres of publicly and privately owned land (Nova Scotia Nature Trust, 2021). The area is home to a variety of plants and animals and is even a migratory corridor for Mainland Moose, which are considered an endangered species in Atlantic Canada (Government of Nova Scotia, 2018). Furthermore, the park is known for its hiking, biking, and running trails (All Trails, 2021). Entrances to the park and trails within the park are unmarked and there are no public amenities within the park. Recently, the city of Halifax acquired most of the parcels of land that make up the park and has designated it as a regional park. However, there are currently no HRM designated entrances to the park. Blue Mountain-Birch Cove Lakes is being considered as a potential national park site,

but an agreement has yet to be reached as of December 2021 (CBC News, 2021). The park has a dedicated conservation group called Friends of Blue Mountain-Birch Cove Lakes that was formed in 2018 to advocate for the protection of the wilderness park (Friends of Blue Mountain-Birch Cove Lakes, 2018).

6.3 Sandy Lake-Sackville River Regional Park

Sandy Lake-Sackville River Regional Park has been recognized as a park for 50 years and currently consists of 1000 acres. However, there have been proposals to acquire and protect an additional 1800 acres that are not currently included within the park's boundary (Sandy Lake Conservation Association, 2018). Several environmental studies of the Sandy Lake area have been conducted by volunteers. One particularly interesting fact from research conducted by Dr. David Patriquin is that there are eleven different habitats contained within Sandy Lake-Sackville River Regional Park that are home to a variety of species of plants and animals (Patriquin, 2021). The park is also known for its beach access, expansive hiking trails, and abundant wildlife (All Trails, 2021). There are several groups that advocate for the protection of Sandy Lake-Sackville River Regional Park including the Sandy Lake Conservation Association and the Sackville Rivers Association. According to the Sandy Lake Conservation Association's website, the group is dedicated to protecting the ecology of the park and raising awareness of issues related to the park (Sandy Lake Conservation Association, 2018). The Sackville River Association website states that the area has suffered the consequences of the surrounding developments and that the organization is committed to protecting and maintaining the Sackville River Watershed (Sackville Rivers Association, 2021).

6.4 Shaw Wilderness Park

The Shaw Wilderness Park was established in 2020 through a partnership between the Nature Conservancy of Canada and the Halifax Regional Municipality after years of advocacy by the Williams Lake Conservation Company and the Backlands Coalition (Nature Conservancy Canada, 2020 & Williams Lake Conservation Company, 2021). Shaw Wilderness is made up of 380 acres and is the smallest of the three parks included in this project (Nature Conservancy Canada, 2020). There are several rare species prominent in Shaw Wilderness Park including jack pine and crowberry. Shaw Wilderness is also known for the over 40 bird species that inhabit the park (Nature Conservancy Canada, 2020). Furthermore, the park is an attractive site for hiking, biking, and swimming (All Trails, 2021). The area where the park is located also once

served as a granite mine, and the granite retrieved from the area was used in the construction of Citadel Hill (Watts, 1994). Shaw Wilderness Park recently acquired an official HRM entry point with a parking lot and crushed gravel trail off Purcell's Cove Road.

7.0 Methods

For my research project, I used a mixed methods spatial analytical exploration approach guided by principles of equity and sustainability. Site analyses allowed me to familiarize myself with the layout of the three parks and their various features. A spatial analysis of access was completed for each park to learn more about the relationship between different spatial and geographic elements in, and around, the three sites such as transportation routes, entry points, and areas of interest. Workshops were conducted with representatives from local stewardship groups who were knowledgeable on the geography and history of the parks to gather specific information that could aid in the creation of detailed maps. Finally, the social vulnerability analysis highlighted areas of deprivation in the communities around the parks that allowed for to conclusions to be drawn about the equitability of access to the parks.

7.1 Site Analysis

I have conducted a site analysis for all three of the study areas. The site analyses helped me familiarize myself with the three parks and their features. I visited each park in person and looked at different transportation options through Google Maps. I was not able to visit all the parks via public transportation as the ongoing pandemic caused me to limit my use of the bus, but I did take into consideration walking and bussing times when it came to traveling to the three parks.

7.2 Workshops

Three workshops were conducted with individuals from park stewardship groups who were knowledgeable on the history and existing features of each park. The workshops took place online due to the ongoing COVID-19 pandemic and utilized Microsoft Teams software. I began recruiting workshop participants by asking local stewardship groups associated with the parks if anyone was interested in participating in my research. The groups I contacted included Friends of Blue Mountain-Birch Cove Lakes, the Sandy Lake Conservation Association, the Williams Lake Conservation Company, and the Backlands Coalition. I also met with individuals

outside of the stewardship groups for individual meetings. After receiving a small number of responses, I opted to reach out to individuals directly which garnered a better response.

I incorporated workshops into the methods of my research because I determined that talking to people directly was the most efficient way to gather specific information about the parks, especially when the volunteers from the stewardship groups created most of the existing resources for the parks. Furthermore, talking to people directly was one way I could include community members who have spent a lot of their time advocating for the protection of the three parks. Each workshop had two or three participants. I limited the number of participants for the workshops because I wanted participants to have enough time to speak and discuss the questions at length. The original limit for the workshops was five participants, but I received fewer responses than expected. Before the workshops began, I sent each participant the informed consent package I prepared as part of my research ethics board approval and asked that they sign the form to ensure the participant was aware that I intended to record the sessions. I also sent each participant a list of questions that would be asked throughout the workshop so that they could prepare their answers in advance. The list of questions can be found in Appendix A.

The questions I prepared acted as a guide for the discussion during the workshops. I took notes as I went through the questions and added important information to a map of each individual parks that was later used to create detailed maps in ArcGIS Pro. I have offered to send my final report to each workshop participant upon its completion.

7.3 Spatial Analysis of Access

Through the workshops, I was able to collect information on the location of entry points, areas of interest, and ecologically sensitive areas within each park. Using data from HRM Open Data as well as ArcGIS Pro software, I was also able to plot the location of bus routes and bike lanes around each park as well as some of the features that were mentioned by my workshop participants. The purpose of the spatial analysis was to assess the spatial relationships between different features around and within the three parks, and to highlight any disparities in access. Disparities in access were signaled by things such as the inconsistency of bus routes, the absence of sidewalks, and the number and location of entry points. Completed maps for each park can be found in the results section of this report.

7.4 Social Vulnerability Analysis

I incorporated a social vulnerability analysis of each park into my methods to investigate whether access to the parks was equitable. I utilized Statistics Canada's Geospatial Explorer tool to illustrate four different factors from the CIMD including economic dependency, residential instability, ethno-cultural composition, and situational vulnerability. The goal of the social vulnerability analysis was to look at communities or neighbourhoods surrounding the parks that exhibited deprivation to determine whether factors related to population composition or socioeconomic status inhibited access to the three parks. Population demographic information was an important element of my study because if the parks were only easily accessible to communities of a certain socioeconomic status or ethnicity, that would be an indicator of inequity that must be addressed.

8.0 Results

8.1 Summary

A table with a breakdown of each of the question asked during the workshops can be found in Appendix B and will be referenced throughout the results section.

8.1.1 Exterior Access

To access an entrance to one of the parks, there is a mixture of public, private, and active forms of transportation available. However, when asked about the types of transportation used to access the parks, the workshop participants noted that the use of a personal vehicle is more common than the use of bikes or public transit (see Appendix B). Shaw Wilderness and Sandy Lake-Sackville River Regional Park have a designated main entrance with a parking lot, but Blue Mountain-Birch Cove Lakes does not have a main entrance or designated parking area. Unmarked entrances to the parks seem to be local knowledge but there are resources about entry points that can be found online. Bus routes are available near all three parks and bike routes are available adjacent to both Shaw Wilderness Park and Sandy Lake-Sackville River Regional Park. Blue Mountain-Birch Cove Lakes also has a few bikeable routes in proximity to some of its unmarked entrances. Participants of the workshops noted that very few of the roads near the three parks have sidewalks and that the lack of sidewalks made access from public transit more challenging (see Appendix B).

8.1.2 Interior Access

Access to the interior of the parks can be achieved through both marked and unmarked entry points, and the three parks varied in terms of number and type (see Appendix B). As mentioned above, only two of the parks have official entrances but there are several unmarked entrances that serve the nearby communities. There was minimal signage or navigational materials available outside or within the three parks. Shaw Wilderness and Sandy Lake-Sackville River Regional Park were the only two with signage at the entrances, but only small trail markers extended into the parks.

8.1.3 Main Access Issues

Equity issues related to park access included a lack of navigational materials for the parks e.g., maps or signage; inconsistent public transit routes near parks; and a lack of entrances for the communities surrounding the parks (see Appendix B). The communities surrounding the parks also all experience some level of deprivation based on the CIMD factors of economic dependency, residential instability, ethno-cultural composition, and situational vulnerability. Sustainability issues related to park access included conserving sensitive areas within the parks while promoting access; maintaining green corridors for wildlife; mindful placement of new entry points; a leaky dam at Shaw Wilderness causing loss of water access; risk of fire; and deterring hunting (see Appendix B).

8.2 Spatial Analysis of Access

8.3.1 Maps

Figure 2. Map showcasing the bus and bike routes, entry points, and areas of interest for Blue Mountain-Birch Cove Lakes urban wildland park.

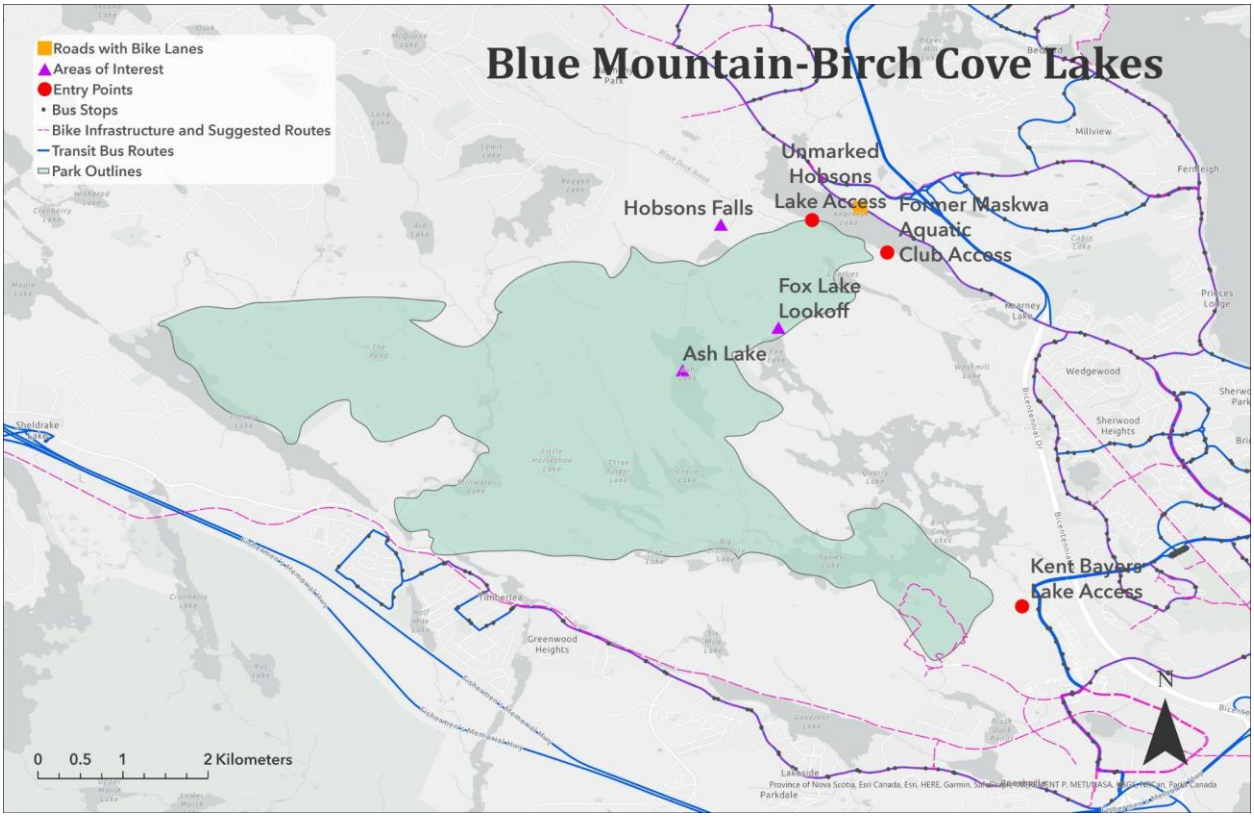


Figure 3. Map showcasing the bus and bike routes, entry points, and areas of interest for Sandy Lake-Sackville River Regional Park.

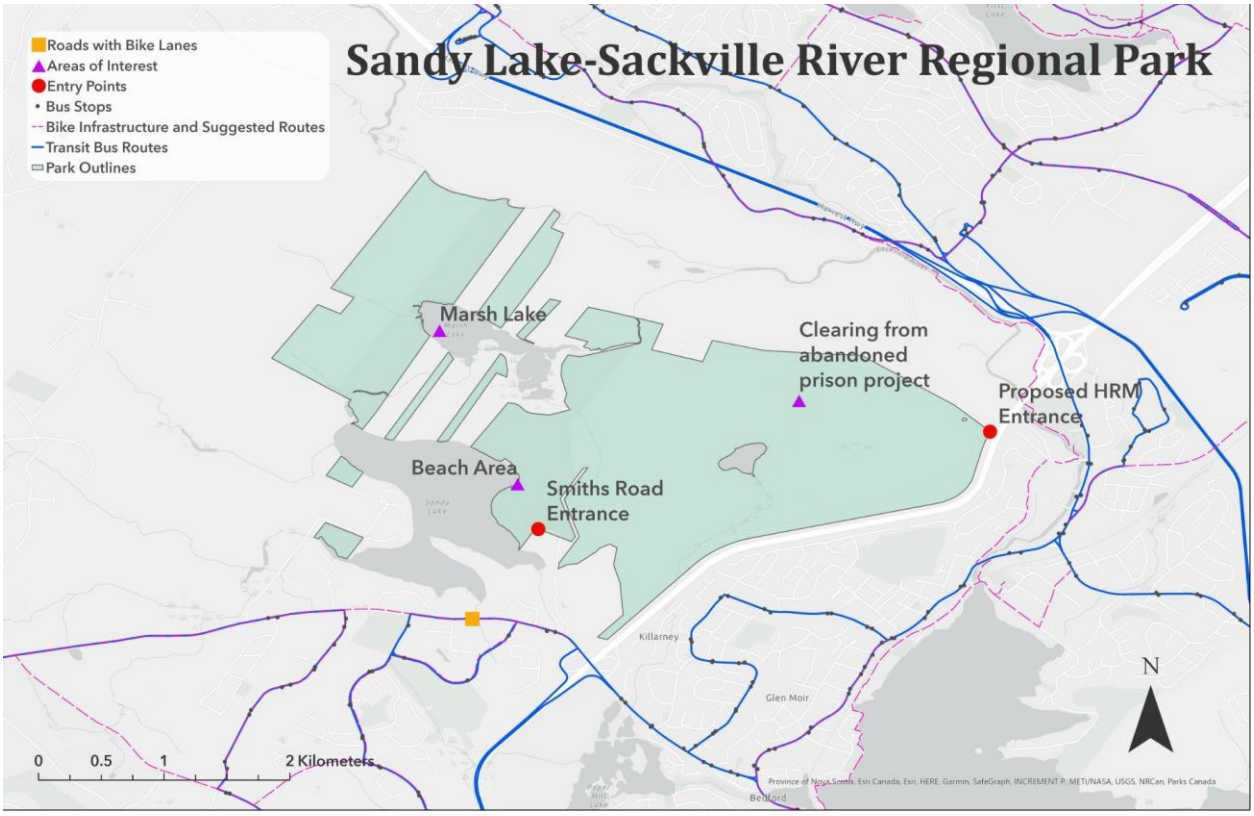
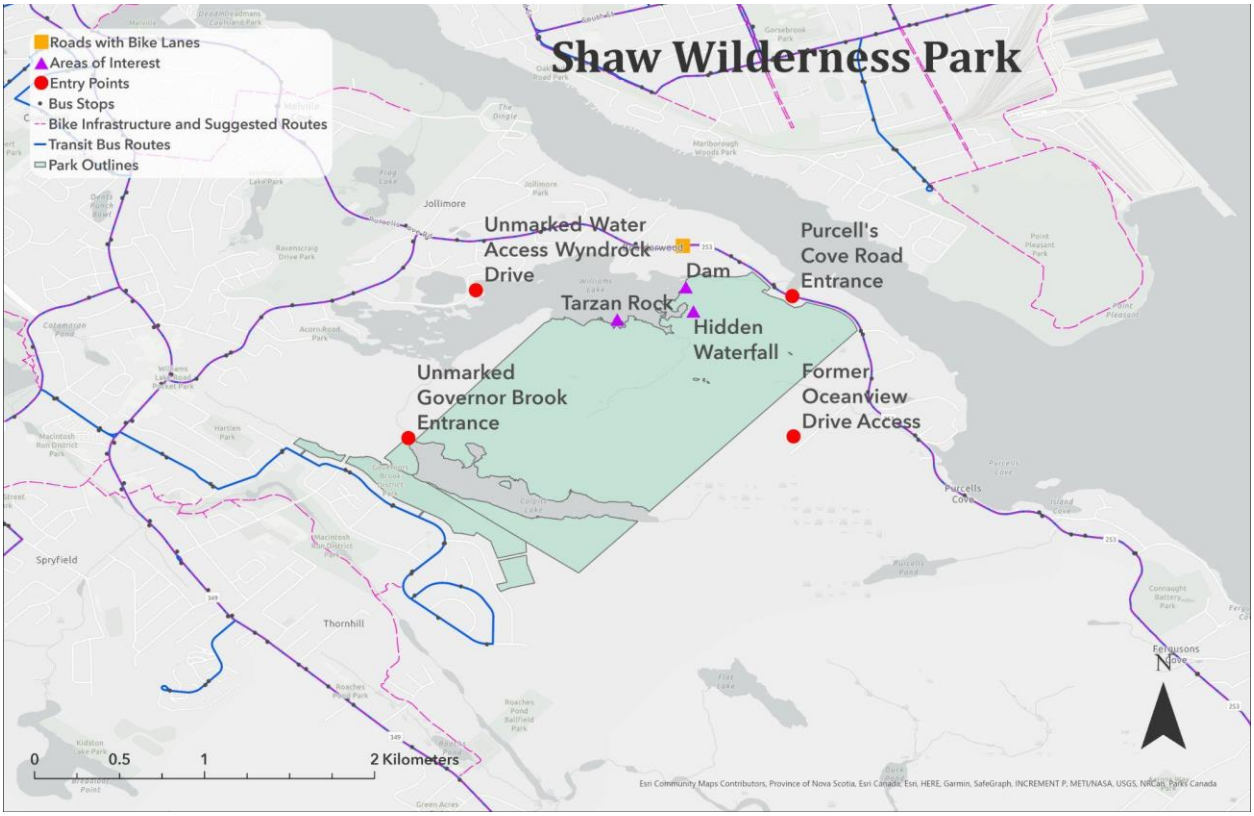


Figure 4. Map showcasing the bus and bike routes, entry points, and areas of interest for the Shaw Wilderness Park.



8.3.2 Findings

All three parks are located on bus routes and have bike lanes in proximity, though the convenience of bike access varies by park. None of the official entrances that exist are accessible by sidewalk, but unmarked entrances within residential neighbourhoods have more sidewalk access. Another issue related to unmarked entrances to the parks is that some cross over private property. One such entrance at the Shaw Wilderness Park has recently been blocked by the owner of the property. Furthermore, entrances are not evenly distributed around the perimeter of any of the parks causing some areas to have more access than others. Entrances also do not always provide convenient access to areas of interest within the parks.

8.4 Social Vulnerability Analysis

Social vulnerability refers to a disadvantage in a community caused by factors such as socioeconomic status, race, ethnicity, level of education, etc., that may limit one's opportunity for recreation or social interaction. All the maps utilized in the social vulnerability analysis were

created using the Statistics Canada Geospatial Explorer tool. I used data from the CIMD available through the Geospatial Explorer to map trends related to four categories including economic dependency, ethno-cultural composition, residential instability, and situational vulnerability. The following section will provide a definition for each of the four categories and will discuss the significance of the maps related to equitable access. Each map contains a red square that indicates the boundary for each of the parks with respect to the map.

8.4.1 Economic Dependency

Economic dependency refers to an individual's, "reliance on the workforce or a dependence on sources of income other than employment income" (Statistics Canada, 2019). Examples of economic dependency include, "the proportion of the population aged 65 and older, the dependency ratio (the population aged 0-14 and population aged 65 and older divided by the population aged 15-64), and the proportion of the population not participating in the labour force" (Statistics Canada, 2019). The following maps show economic dependency trends in the areas surrounding each of the three parks. The darker tones shown on each of the maps indicate higher levels of deprivation and the lighter tones indicate lower levels of deprivation.

Figure 5. Map of economic dependency variables for the communities surrounding Blue Mountain Birch Cove Lakes urban wildland park.

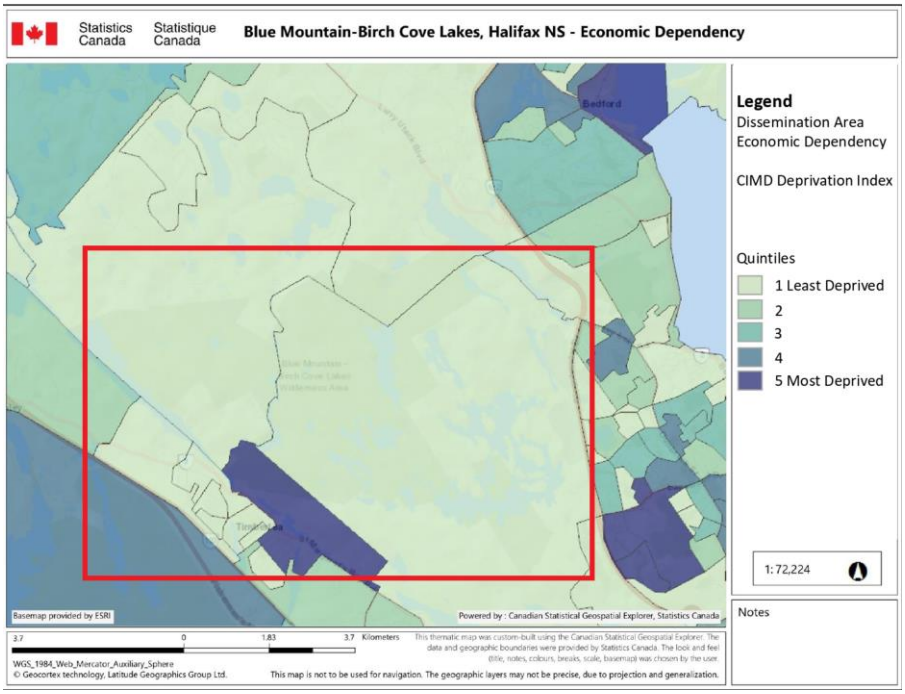


Figure 6. Map of economic dependency variables for the communities surrounding Sandy Lake-Sackville River Regional Park.

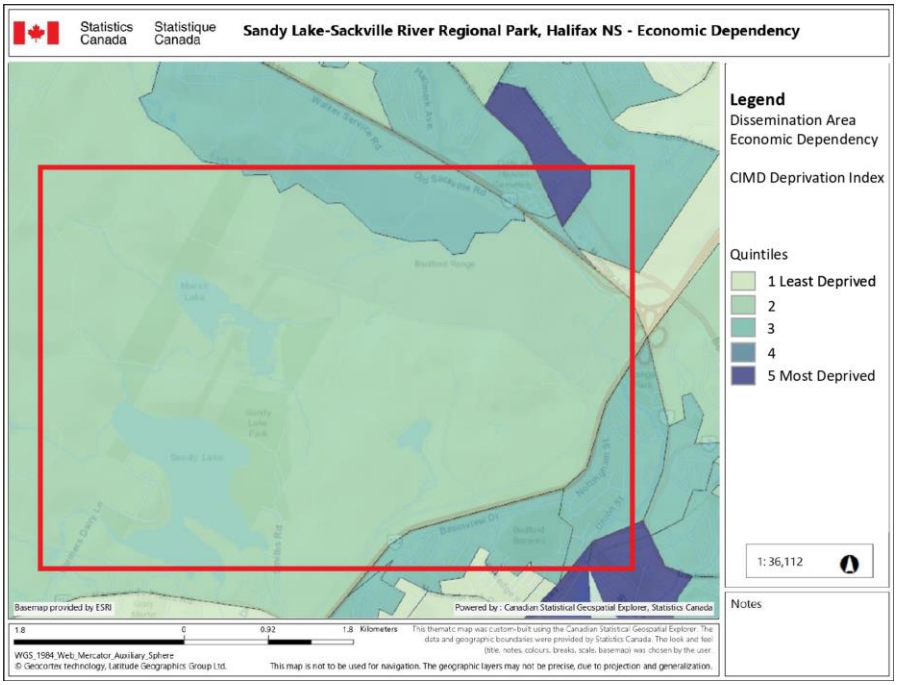
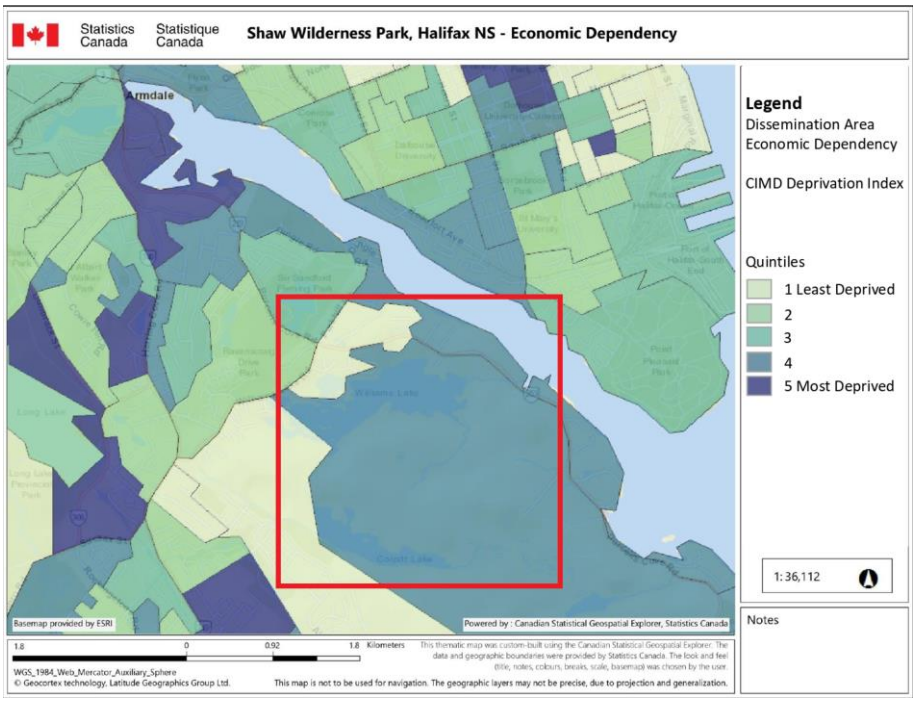


Figure 7. Map of economic dependency variables for the communities surrounding the Shaw Wilderness Park in Halifax, Nova Scotia.



8.4.2 Ethno-cultural Composition

Ethno-cultural composition refers to populations who are considered new immigrants, who were born outside of Canada, who identify as a visible minority, or who have no knowledge of the official languages spoken in the area (Statistics Canada, 2019). New immigrants may experience additional barriers to accessing parks compared to other groups as using the bus system or reading signs would be a challenge if one does not speak the language. Not being able to navigate oneself in the community due to language barriers may inhibit people from branching outside of their community for recreational activities such as visiting parks.

Figure 8. Map of ethno-cultural composition variables for the communities surrounding Blue Mountain-Birch Cove Lakes in Halifax, Nova Scotia.

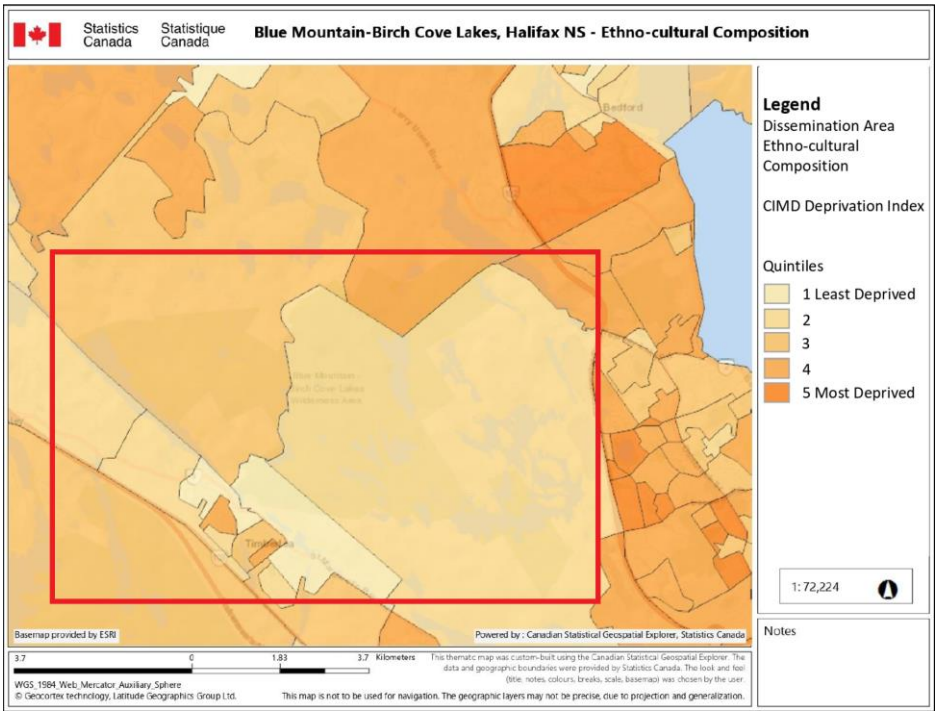


Figure 9. Map of ethno-cultural composition variables for the communities surrounding Sandy Lake-Sackville River Regional Park in Halifax, Nova Scotia.

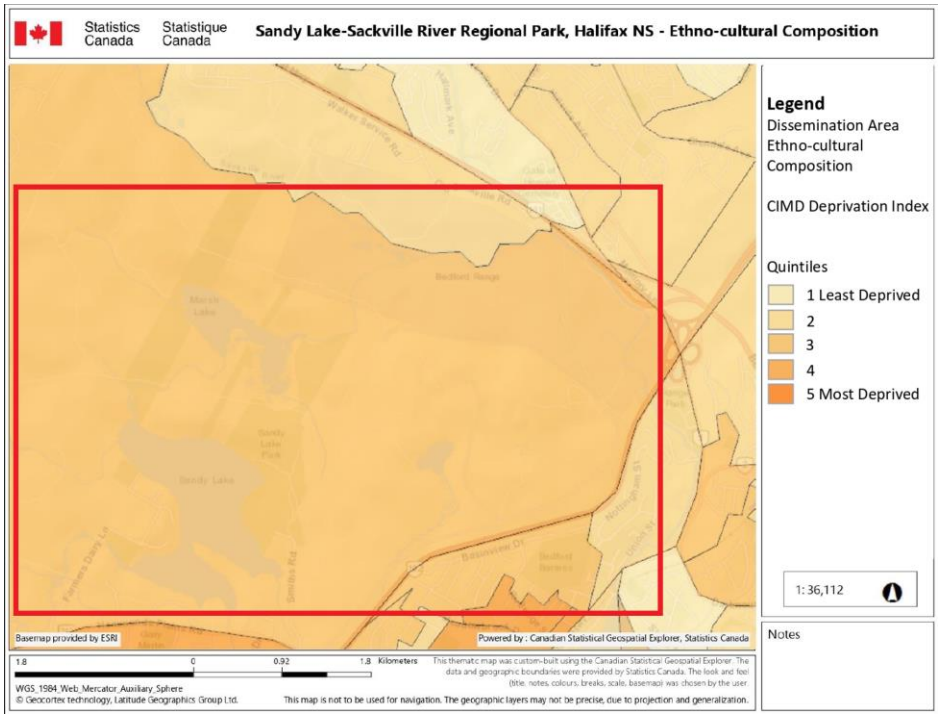
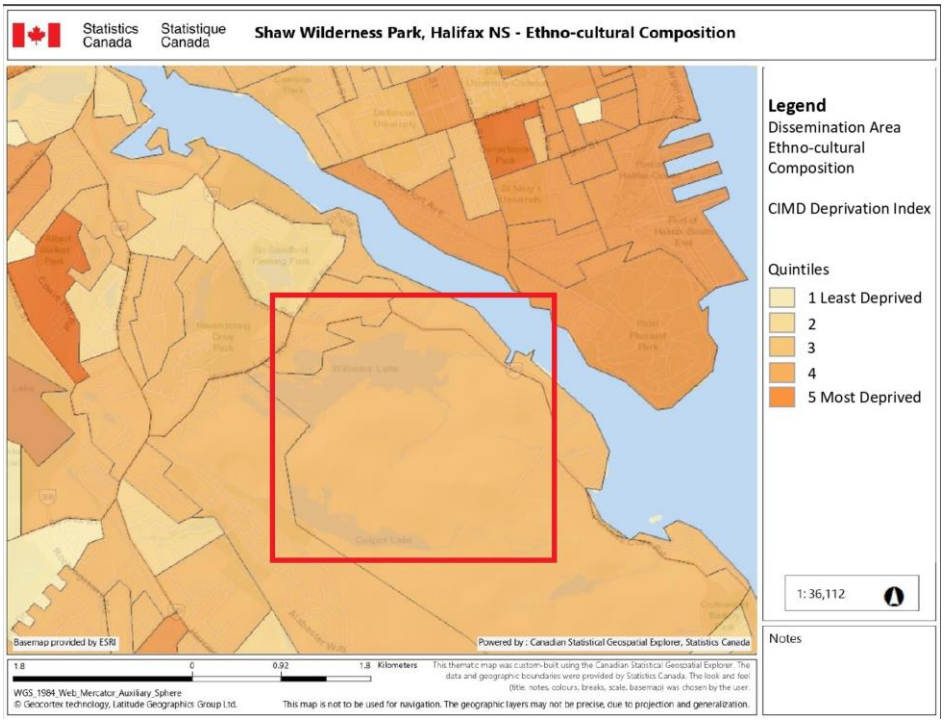


Figure 10. Map of ethno-cultural composition variables for the communities surrounding the Shaw Wilderness Park in Halifax, Nova Scotia.



8.4.3 Residential Instability

Residential instability refers to populations who do not own their home, who may move around a lot, or who may experience periods of homelessness (Statistics Canada, 2019). Examples of residential instability may include, “the proportion of the population who have moved in the past five years, the proportion of persons living alone, and the proportion of occupied units that are rented rather than owned” (Statistics Canada, 2019). The lighter areas on the maps below represent stability and the darker areas represent instability (Statistics Canada, 2019).

Figure 11. Map of residential instability variables for the communities surrounding Blue Mountain-Birch Cove Lakes in Halifax, Nova Scotia.

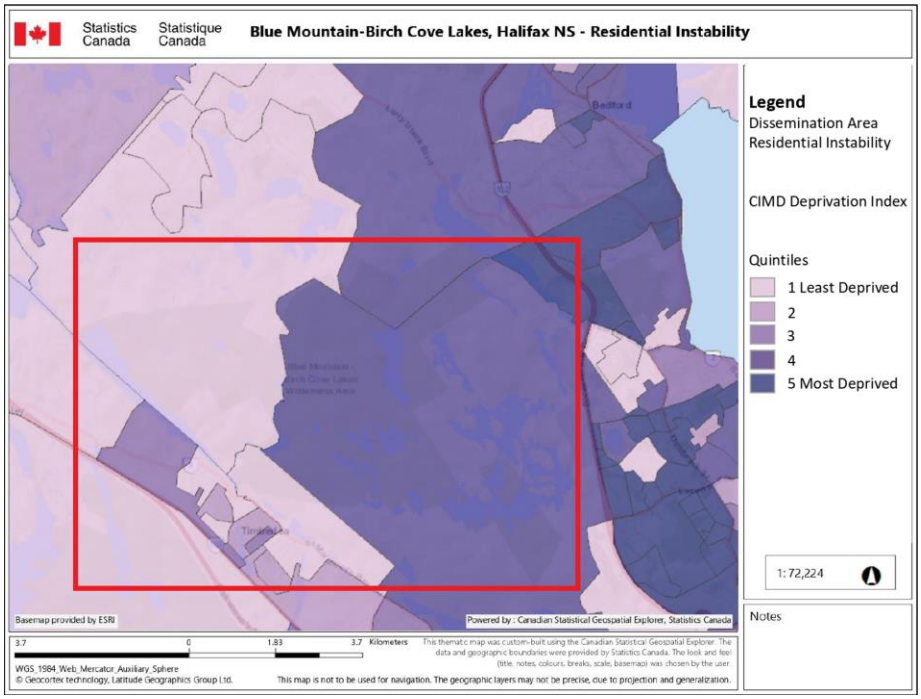


Figure 12. Map of residential instability variables for the communities surrounding Sandy Lake-Sackville River Regional Park in Halifax, Nova Scotia.

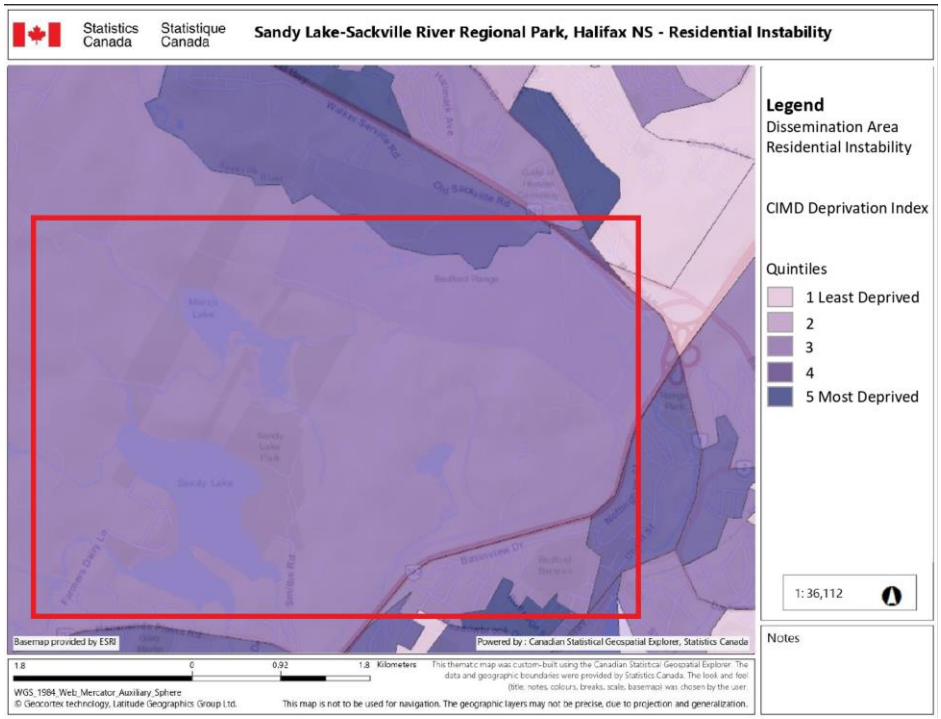
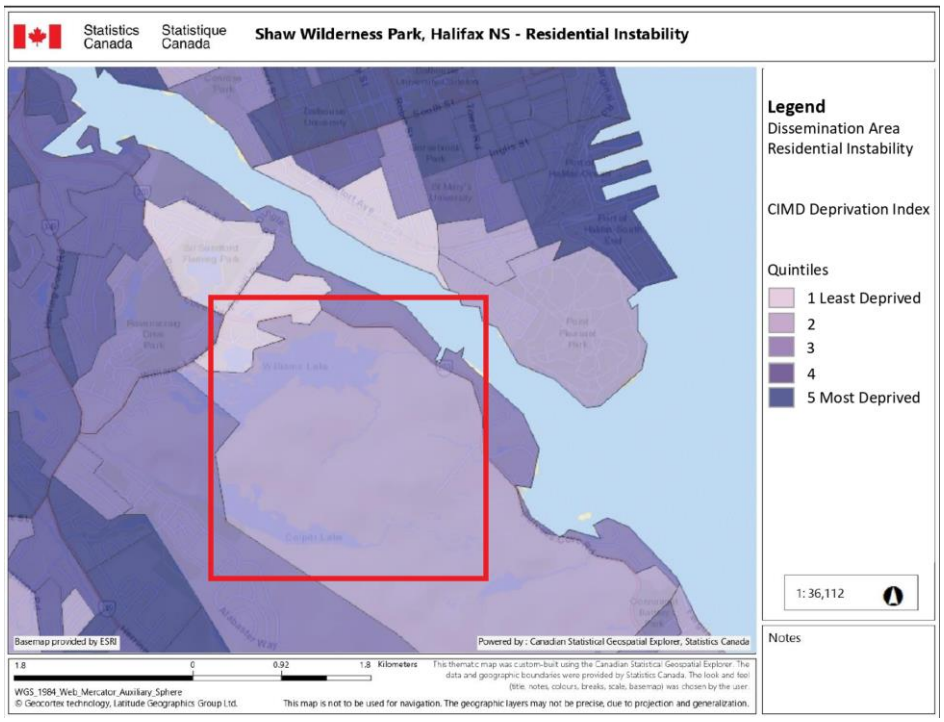


Figure 13. Map of residential instability variables for the communities surrounding the Shaw Wilderness Park in Halifax, Nova Scotia.



8.4.4 Situational Vulnerability

Situational vulnerability refers to, “variations in socio-demographic conditions in the areas of housing and education, while taking into account other demographic characteristics” (Statistics Canada, 2019). This includes, “the proportion of the population aged 25 to 64 without a high-school diploma, the proportion of the population identifying as Aboriginal, and the proportion of dwellings needing major repairs” (Statistics Canada, 2019). The attributes associated with situational vulnerability overlap with socioeconomic status. One’s situational vulnerability may inhibit their access to parks if one is unable to afford a car to drive to the parks or if they feel like they do not belong in the space.

Figure 14. Map of situational vulnerability variables for the communities surrounding Blue Mountain-Birch Cove Lakes in Halifax, Nova Scotia.

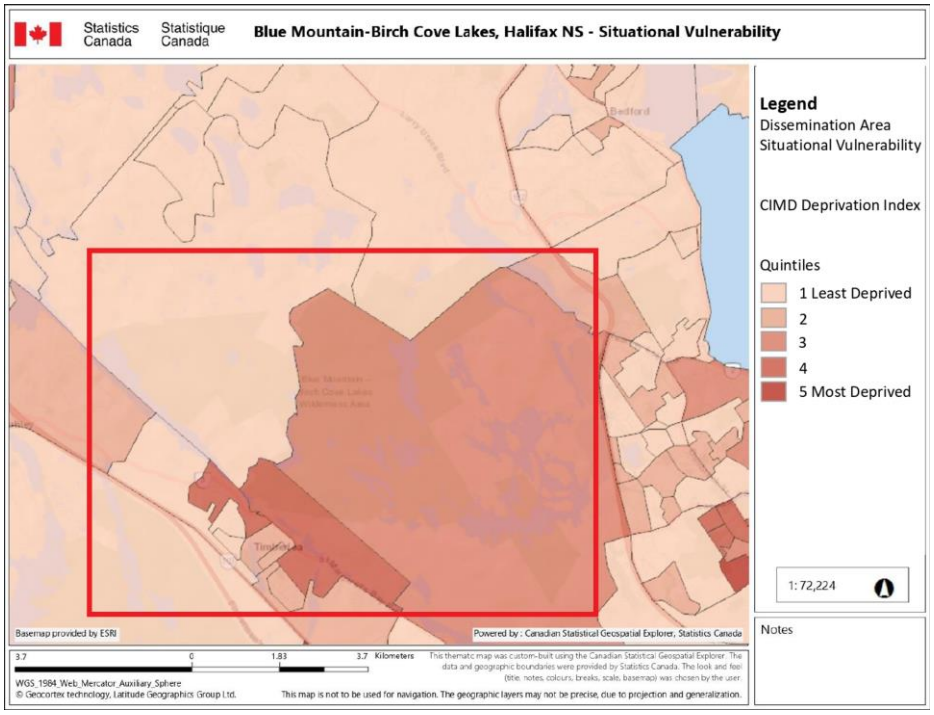


Figure 15. Map of situational vulnerability variables for the communities surrounding Sandy Lake-Sackville River Regional Park in Halifax, Nova Scotia.

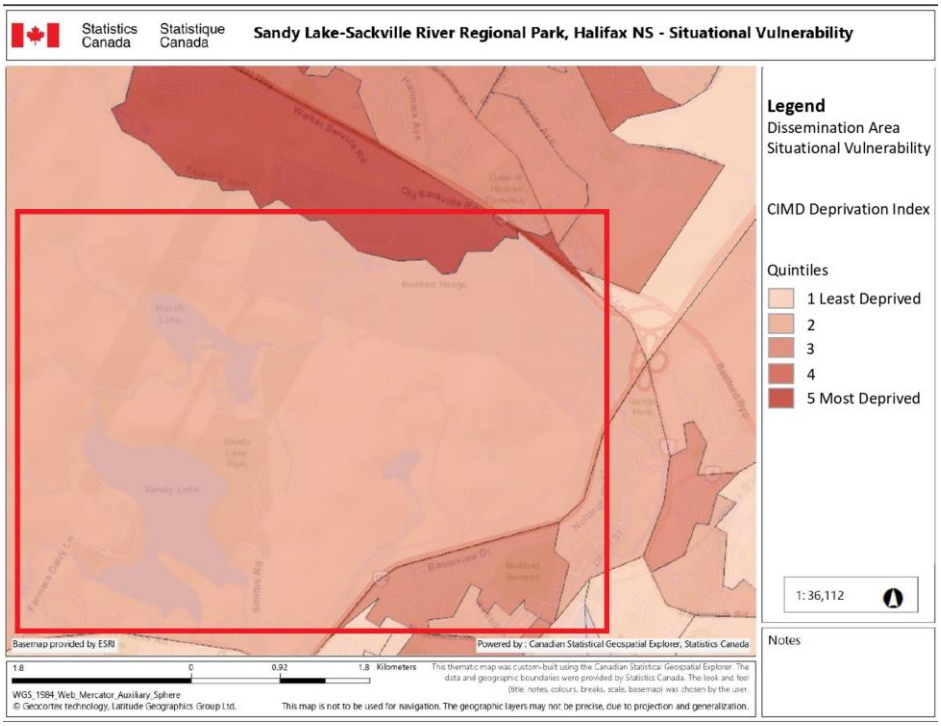
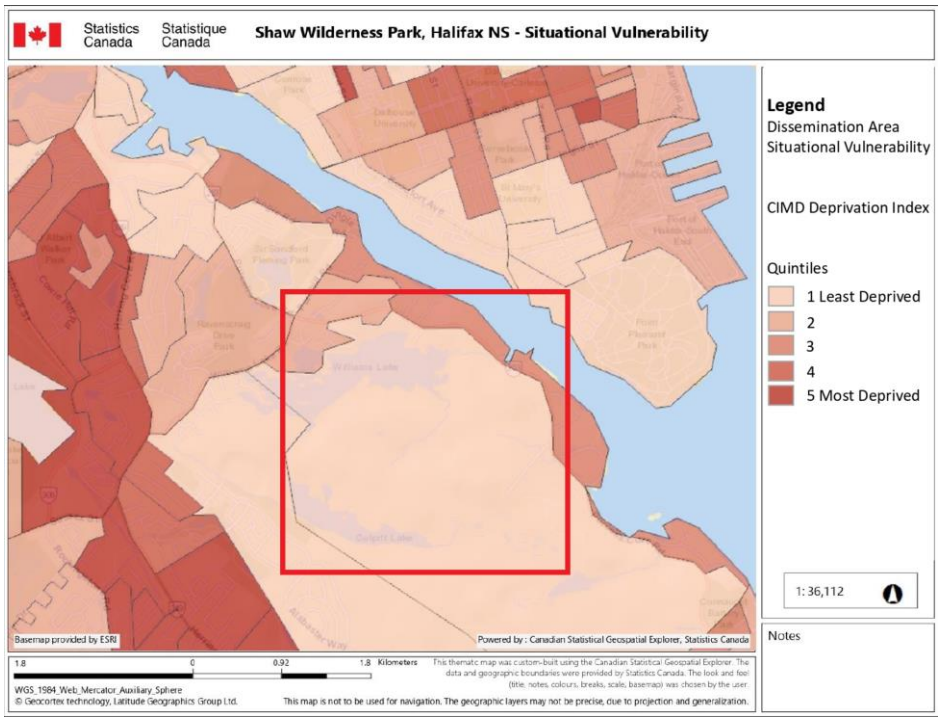


Figure 16. Map of situational vulnerability variables for the communities surrounding the Shaw Wilderness Park in Halifax, Nova Scotia.



8.4.5 Findings

All the maps for the four CIMD categories show a combination of lighter and darker areas in the communities surrounding the three parks indicating varying levels of deprivation. The maps indicate that the communities surrounding Blue Mountain-Birch Cove Lakes and Sandy Lake-Sackville River Regional Park have less income diversity compared to the communities surrounding the Shaw Wilderness Park. Furthermore, the communities surrounding Blue Mountain-Birch Cove Lakes and the Shaw Wilderness Park have more ethno-cultural diversity than the communities surrounding Sandy Lake-Sackville River Regional Park. The communities surrounding all three parks experience higher levels of residential instability. Finally, the communities surrounding Blue Mountain-Birch Cove Lakes experience lower levels of situational vulnerability, while the communities surrounding both Sandy Lake-Sackville River Regional Park and the Shaw Wilderness Park experience higher levels of situational vulnerability.

Based on the maps, I can assume that the communities surrounding the three parks are populated by individuals with varying levels of deprivation based on economic dependency, residential instability, ethno-cultural composition, and situational vulnerability. From the perspective of equitable park access, having a mixture of these factors is positive as it indicates that there are opportunities for park access for people with varying race/ethnicities, socioeconomic status, and housing situations. While access to parks will not eliminate inequity for these communities entirely, improving access does have the potential to enhance people's quality of life through physical activity and interaction with nature. Equitable access to parks means that parks are accessible to a large variety of populations and based on my findings I concluded that the three study areas are relatively equitably accessible.

9.0 Discussion

From my research, I learned that there are several infrastructural barriers that inhibit access to the three urban wildland parks. The first research sub-question was *what transportation routes are available near park entry points e.g., bus routes, bike routes, walking paths, and how equitable and sustainable are the available transportation options?* All three parks are in proximity to bus routes, but there were some notable issues with the scheduling and frequency of the buses. For example, the closest bus route to the entrance for the Shaw Wilderness Park on Purcell's Cove Road only runs during rush hours on weekdays meaning that anyone wanting to access the park via bus would have to do so during the morning or early evening of a weekday. However, Purcell's Cove Road recently acquired a new bike lane,

providing direct access to the Shaw Wilderness Park's entrance via bicycle. Since Blue Mountain-Birch Cove Lakes does not currently have an official entry point, there are no buses that take you directly to an entrance to the park; however, there are bike lanes on Hammonds Plains Road and Kearney Lake Road that provide indirect access to the park. Sandy Lake-Sackville River Regional Park's main entrance is close to bus stops and the bike lane on Hammonds Plains Road provides access to Smiths Road where the entrance is located.

All three of the workshop groups discussed issues with the public transit options near the parks. The buses posed the largest problem and the workshop groups mentioned that some routes have been redirected to areas that no longer provide convenient access to the parks and others have been cut altogether. Participants of the Shaw Wilderness Park workshop mentioned that the reason that routes were cut is that not enough people used them. However, there were several articles published around the time the routes were cut with comments from residents in the area that were concerned about how the discontinuation of the routes on Purcell's Cove Road would impact access to nature (CBC News, 2018). Access to the parks by foot is a challenge due to the lack of sidewalks on the roads leading to park entry points. Furthermore, all three workshop groups thought that personal vehicles were the most common form of transportation to the parks. The discussion on transportation brought us to the next question about where entry points are located around the park and if the available transportation options facilitate access to existing entrances.

The second research sub-question was *where are entry points to the three study areas located, and how accessible are the entry points via transportation routes?* Both Shaw Wilderness Park and Sandy Lake-Sackville Regional Park have an official entrance with a parking lot and main trail that branches off into unmarked trails. Blue Mountain-Birch Cove Lakes does not currently have an official entrance, but there is a project in the works to create an official entry point to the park. Though only some of the parks have a recognized main entrance, all the parks have many unmarked entrances that have been created by users of the parks over the years. The workshop participants mentioned that the bus routes near the park do not always facilitate access to the entrances. Sandy Lake-Sackville River Regional Park's closest bus stop is still roughly a thirteen-minute walk to the main entrance on a road without sidewalks. Blue Mountain-Birch Cove Lakes has an entrance located behind the Kent in Bayers Lake, but as it is an unmarked entrance, the bus does not provide convenient access. The participants of the Blue Mountain-Birch Cove Lakes workshop also mentioned manmade trails that have been created by a business owner off Hammonds Plains Road, but access from that area is indirect. Shaw Wilderness has visitors who rely on boat access and has the unique

problem of a leaky dam that has caused the water level of the lake to recede to a level that makes water access challenging.

The workshop groups all emphasized the need for more official entrances to the parks to promote more sustainable access. Shaw Wilderness and Sandy Lake-Sackville River Regional Park have main entry points, but there is only one per park. Two of the workshop groups discussed implementing several new entrances at once for the most equitable and sustainable access. Having multiple entrances around the perimeter of the park would allow for more communities to access the park and would mitigate environmental damage to the areas surrounding the entry points. Furthermore, participants of the Shaw Wilderness workshop emphasized the fact that the leaky dam must be fixed and there is an ongoing initiative by Williams Lake Conservation Company to gain support from HRM to repair the dam.

Finally, the third research sub-question was *where are areas of interest such as look-offs, lakes, etc., within the parks, and how accessible are these areas of interest from the entry points?* My workshop participants provided me with information about the history of the parks, the types of habitats contained within the parks, and the many species that occupy the parks. I was also able to plot the approximate location of interesting areas such as trailheads, waterfalls, swimming areas, and look-offs using ArcGIS software. The workshop participants stated that aside from popular swimming spots and obvious trailheads, most of the interesting areas or aspects of the parks are not conveniently accessible from park entry points. One participant noted that visitors often stumble across interesting areas unintentionally and that to find them you must already know where they are. Some parks had existing maps of the parks and their areas of interest but not all the areas of interest mentioned by the participants could be plotted on the map during the workshop.

Participants mentioned the need for navigational materials such as signs or trail maps that could help people who want to visit the park. A participant of the Sandy Lake-Sackville River Regional Park mentioned that wilderness parks are often forgotten but that they need to be actively maintained. However, the addition of traditional amenities is a complex issue as an attractive feature of urban wildland parks is that they are undeveloped. Preferably, development of the parks would be minimal to maintain the appeal of the parks as well as the connectivity for wildlife. One participant said that the placement of new entry points must be considered carefully as there are sensitive areas contained within the parks that should be avoided by most visitors. Some groups suggested that educational programs and content may be able to teach people about the sensitive areas within the parks and how to avoid being destructive during park visits. Improving physical infrastructure, navigational materials, and educational

programming around these parks could make access to the parks easier for the public.

Through my research, a few gaps from the literature have been addressed including how we can assess the equitability of park access and what features both around and within parks facilitate sustainable and equitable access. I was able to find common issues with access between the three parks such as inadequate public and active transportation options that could be used as a starting point for planners to improve access to wilderness parks in Halifax and other cities through built infrastructure. Furthermore, my research has opened avenues for further research into the ways humans connect with nature and how we can facilitate easier access to wilderness parks to reduce inequity and improve quality of life.

10.0 Recommendations

The recommendations discussed in this section were derived from the workshops. Participants of the workshops were highly knowledgeable and had a variety of ideas on how access could be improved for the three urban wildland parks. All three groups mentioned the need for official entrances to be implemented at the parks. For Blue Mountain-Birch Cove Lakes, the group wanted several entrances to be implemented at the same time to avoid overuse and environmental degradation around entrances. The Sandy Lake-Sackville River group stated that they wanted entrances at four sides of the park to facilitate access for the four main neighbourhoods that surround the park including Bedford, Sackville, Kingswood, and Hammonds Plains (Sandy Lake Conservation Association, 2021). Shaw Wilderness recently acquired an official entrance on Purcell's Cove Road but agreed that distributing entry points around the perimeter of the parks was an effective method for improving access.

Each group had ideas about planning and how important comprehensive park planning is for the future of the parks. Conservation efforts were a priority as there are areas in each park that should not be overused due to their sensitivity. Some participants noted that it could be beneficial if people knew about the sensitive areas to improve local understanding of their ecological significance. One participant described access to wilderness areas as a "double-edged sword" because they want people to enjoy wilderness areas, but do not want people to destroy them. A suggestion for how to mitigate damage to the parks was public education campaigns that discuss the importance of the area and provide details about the ecological features of the parks.

11.0 Limitations and Future Research

There were several limitations noted during my research. One limitation was that my field research was not as extensive as it could have been due to the pandemic impeding my use of public transit. Being able to visit the sites more often and getting to experience traveling to the parks via public transit would have provided a more well-rounded analysis of the types of transportation that provide access to the parks. Another limitation was the fact that the individuals who participated in the workshops were heavily involved in the parks and many of them lived within walking distance, so they did not have the experience of a casual user of the parks. Furthermore, I was only able to recruit two to three people for each of my workshops and having larger workshops would have provided me with more insight on current access issues. Lastly, a possible limitation was that I did not consult with a park planner during my research. Having a planner that specialized in parks weigh-in on access issues may have provided me with a different perspective, but I chose to focus on stewardship groups because they are extremely knowledgeable and have dedicated so much time to the parks.

Future researchers should investigate who uses wilderness parks to determine if park access is truly equitable for the surrounding communities. The CIMD does not provide nuance when it comes to the factors that contribute to things like economic dependency or situational vulnerability, so there was no way to differentiate between the different factors on the maps I created. Teasing out the nuance may provide a better picture of the barriers to equitable access that exist for urban wildland parks both in Halifax and in other areas.

Because some of the parks had no official entry points or the entrances were relatively new, it was unclear whether the addition of more entry points would cause environmental damage to the parks. As the parks gain entry points from HRM, it would be interesting to monitor the environment surrounding the entrances to determine how they could be better protected to facilitate more sustainable access to the parks. A final future research recommendation is to investigate how to navigate providing equitable or sustainable access to wilderness parks when the land making up the parks is owned by several different landowners. It could be valuable to research best practices on providing access to privately owned areas within urban wildland parks to determine the best approach for improving access to Halifax's urban wildlands.

12.0 Conclusion

The question I began my research with was *how equitable and sustainable is access to Halifax's urban wildland parks?* While a figure cannot be placed on accessibility, my research has uncovered common accessibility issues for urban wildland parks within HRM. In Halifax, public transit is lacking around the parks because they are located on the edges of the city and have fewer people using the routes. Bike lanes are also not as widespread in Halifax as they are in other cities, and though there are bike lanes running adjacent to a few of the parks, not all the bike lanes connect to other areas of the city in a meaningful way. Some of the parks have minimal signage, and it was suggested that implementing more signs and obvious trail markers could make the parks more accessible for a variety of visitors. The most promising outcome of my research was discovering that some of the communities in the vicinity of the parks were relatively diverse regarding the CIMD determinants of economic dependency, ethno-cultural composition, residential instability, and situational vulnerability. This means that a variety of people of different socioeconomic standing have similar levels of access to the parks, meaning that the parks, at least on some level, are equitably accessible. More research on both equitable and sustainable access to urban wildland parks is required to determine best practices as the existing literature is severely limited. With the pandemic piquing more people's interest in connecting with nature, there has never been a better time to research the relationships between humans and nature and how we can maintain that relationship into the future through equitable and sustainable park access.

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Appendix A: Workshop Questions

1. Where are park entry points located?
2. What types of transportation routes are available around the park e.g., bike trails, walking trails, public transit?
3. Which methods of transportation are commonly used around the park?
4. What are some areas of interest within the parks that people enjoy visiting?
    a. Where are they located?
    b. Describe their features.
    c. How would you describe access to these areas from the entry points?
5. What navigational materials are available e.g., maps, trail guides?
6. Are there areas of the park that should be avoided by visitors? e.g., Are there areas that are environmentally sensitive?
7. What does sustainable park access mean to you?
8. What does equitable park access mean to you?
9. Are there any existing equity issues related to access? If so, please describe them.
10. Are there any existing sustainability issues related to access? If so, please describe them.

Appendix B: Breakdown of Workshop Questions

Question	**Workshop 1:** Blue Mountain-Birch Cove Lakes	**Workshop 2:** Shaw Wilderness Park	**Workshop 3:** Sandy Lake-Sackville River Regional Park
Where are park entry points located?	• Unofficial "main accesses" Maskwa Aquatics Club (recent parking lot conflict) • Thunderbird diner has trails, no direct access • Other unmarked access points around perimeter • Official HRM entrance in works	• HRM entrance on Purcell's Cove Road • Unmarked entrance off Alabaster Way/Governor Brook • Water access on Wyndrock Drive • Former unmarked access off Oceanview Drive (privately owned)	• One main entrance on Smiths Road • Proposed HRM entrance off of highway 102
What types of transportation routes are available around the park?	• Bus stops on Chain Lake Drive • Bike lane on Kearney Lake Road and Hammonds Plains Road	• Bus stops on Purcell's Cove Road (only run weekdays during rush hours) • Bike lane on Purcell's Cove Road • No sidewalks	• Bus stop near Smiths Road • Bike lane on Hammonds Plains Road leads to Smiths Road • No sidewalks on Smiths Road

Which methods of transportation are commonly used around the park?	• Bus or personal vehicle, though no parking lot available	• Mostly personal vehicle • Bike due to Purcell's Cove Road bike lane	• Mostly personal vehicle
What are some areas of interest within the parks that people enjoy visiting?	• Lakes • Trails • Look Offs • Waterfalls	• Lakes (Williams and Colpitt) • Hidden Waterfall	• Marsh Lake and Sandy Lake (swimming, fishing, kayaking)
What navigational materials are available?	• Almost all produced by volunteers/stewardship groups • All trails website has detailed trail maps	• Almost all produced by volunteers/stewardship groups • Maps available on Williams Lake Damn Association Facebook Group	• Not much available • Sandy Lake Conservation Association has reports on the park on website
Are there areas of the park that should be avoided by visitors?	• Mainland Moose spotted in area (endangered)	• No off-limits areas • Discussed education on natural features	• 11 different habitats identified within park
What does sustainable park access mean to you?	• Multiple entrances opened around the perimeter • Consider wildlife	• Can get in to park all year round • Obvious entrances	• People can enjoy the park without compromising sensitive areas

	when placing entrances ● Balance between access and conservation	● Preventing excessive development ● Someone caretaking and maintaining park	● Deterring access for ATVs and hunting
What does equitable park access mean to you?	● Access points where people are already located ● Access points that are obvious e.g., having signs/stairs where needed	● Navigational materials in multiple languages ● Efficient public transit options ● Consistent signage	● Public transit provides access to park entrances
Are there any existing equity issues related to access?	● Lack of official entrance	● Lack of navigational materials ● Lacking bus routes	● 4 communities surround the park, only one side has an official entrance ● Groups want to expand the boundary

Are there any existing sustainability issues related to access?	• Maintaining green corridors • Avoiding sensitive areas • Protecting water from overuse • Placement of entrances	• Leaky dam	• Avoiding sensitive areas • Connectivity between wilderness areas • Issues with hunters • Fire and ATV use