

Understanding Local Values Related to the Urban Forest:
Connecting Winnipeg Residents to their Trees

by

Jaclyn Diduck

A Thesis submitted to the Faculty of Graduate Studies of
The University of Manitoba
in partial fulfilment of the requirements of the degree of

MASTER OF NATURAL RESOURCES MANAGEMENT

Natural Resources Institute
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Abstract

Canada's urban forests play a critical role in local environmental systems and conditions, and will likely be the most influential forest of the 21st century (Nowak et al. 2001; Dwyer et al. 2003). Winnipeg is home to the largest remaining elm forest in North America and has a long and unique history with its residents. While a great deal of research has examined the many urban forest benefits, there was opportunity to further develop an understanding of residents expressed values and preferences in relation to Winnipeg's urban forest ecosystems. The study adopted a qualitative research approach, collecting data through multiple methods including site tours, participant journals, photo elicitation, and follow-up semi-structured interviews. The results indicate that Winnipeggers have deeply held urban forest values, particularly in relation to aesthetics, naturalness and biodiversity, and social values such as recreation and alternative uses. Personal development of the values held began early in life, has occurred over time, and is continually reassessed through critical reflection.

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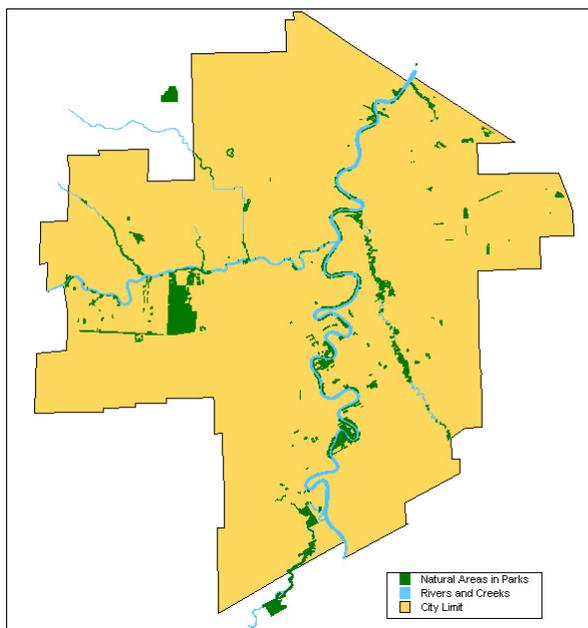
Chapter 1 Introduction to the urban forest

1.0 The urban forest

Ecologically, Canada's forests have an influential role on environmental systems and conditions. They are an essential resource for moderating climate, purifying water, improving air quality, and providing wildlife habitat (Natural Resources Canada 2006). Along with ecological benefits, forests are a source of recreation and provide aesthetic values and benefits for Canadians (Natural Resources Canada 2006). Not only do Canada's hinterland forest ecosystems play an essential role in the lives of Canadians, the urban forests may be the only forest that some urban residents will ever experience (Nowak et al. 2001), which makes it crucial to have an understanding of how residents value these forests.

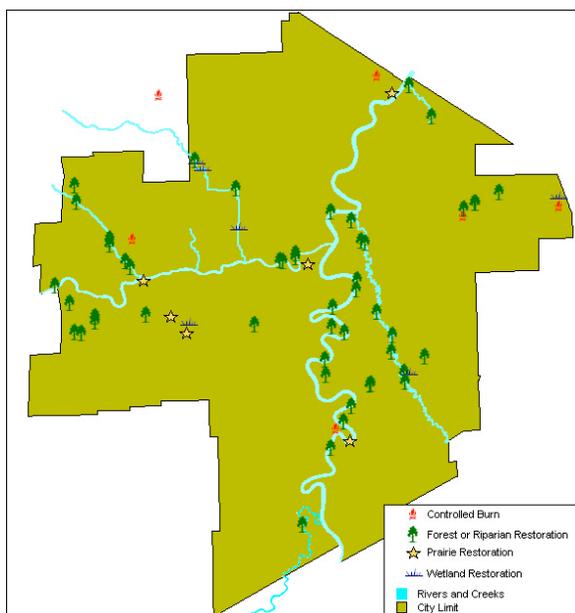
There are many positive incentives or rationales for having urban forest ecosystems within our cities, including environmental, social, and economic values (Nowak et al. 2001). Urban trees are effective in reducing air temperature, increasing air humidity, reducing wind speed, absorbing air pollutants and particulate matter, reducing carbon dioxide, and reducing noise levels (Streiling and Matzarakis 2003). In Winnipeg, the urban forest consists of a limited number of tree species because of the harsh climate and soil conditions. The trees most commonly found throughout the city include elm, ash, maple, oak, poplar, basswood, willow, birch, spruce, pine, cedar, and some fruit trees (City of Winnipeg 2010). Many of these grow in the natural habitats or parks in the city (see Figure 1). The urban forest ecosystem is continually evolving as areas are deforested for infrastructure development or restored and preserved (see Figure 2).

Figure 1. Urban forest ecosystems in Winnipeg



(City of Winnipeg 2010)

Figure 2. Ecosystem restoration in Winnipeg



(City of Winnipeg 2010)

In Winnipeg, there has been a longstanding connection between residents and urban trees. The story of the Wolseley elm emphasizes this connection. The Wolseley elm was planted in 1859 by a young girl and nearly 100 years later the tree remained in the middle of a residential street. It was believed that the elm and surrounding grass had been declared the smallest park in the world. Of course, a huge old tree in the middle of a street would not please many residents or drivers, and it was considered to be a safety hazard. In the late 1950s, when the tree was threatened to be cut down, a group of women came together, protested and fought off the city workers who were trying to cut it down. The women won that day, along with many supporters and the Winnipeg mayor at the time, but eventually the tree was lost to vandalism and had to be cut down (Tree Help Ltd. 2007). Wolseley neighbourhood residents continue to place high value on their urban forest and the story of the Wolseley elm lives on in posters.

Figure 3a. and 3b. The women of the Wolseley elm



(The Winnipeg Tribune 1957, UMA)

1.1 Understanding urban forests

An urban forest is defined broadly as the natural and planted trees that are found in urban areas (Ordóñez and Duinker 2010). This definition is further elaborated as all trees and other associated ecological components within urban areas. Urban forests are ecosystems characterized by the presence of trees and other related vegetation in association with people and their developments (Nowak et al. 2001). Ordóñez and Duinker (2010) discuss a number of characteristics such as structure, connectedness, dynamic and driving forces, and values that render the urban forests significantly different from hinterland forests. Structure encompasses the biophysical and geographic properties, which include tree arrangement, composition, diversity, age, and health, leading to the overall functions and services that these ecosystems provide. Physical connectedness within urban forests is virtually opposite that of hinterland forests, as urban forests tend to be highly fragmented.

Although possessing weak physical connections, the urban forests have a strong connection with urban residents. Our daily interactions with the city trees positively affect our decisions, cause us to rethink certain actions, and ultimately increase the overall well-being of all urban residents (Ordóñez and Duinker 2010; Nowak et al. 2001). These dynamic and driving forces are linked with structure and connectedness as it combines natural development and human processes within the same region. Finally, Ordóñez and Duinker (2010) identify the broad concept of understanding the values held by humans as critical to urban forest management. As such, human values related to urban forests ecosystems and how these values are developed is the central focus of the research.

1.2 Purpose and objectives

This project falls within a larger research program that has as its general purpose the development of a comprehensive framework for urban forest values in Canada. This was addressed through determining the values of people living in selected Canadian cities: Winnipeg, Halifax, Fredericton, and Calgary. Within the larger project, my project purpose was to develop an understanding of the urban forest values held by the residents of the city of Winnipeg. To fulfill this purpose, several objectives were established to further my understanding of urban forest values, including:

- To develop an understanding of what Winnipeg residents consider as an urban forest ecosystem.
- To understand how citizens' values differ in relation to the various scales of urban forest ecosystems.
- To explore how urban forest values may differ in relation to different types of forest ownership.
- To determine how Winnipeg residents have learned about the urban forest, thereby informing the values they currently hold.

1.3 Methods

The project used a qualitative research design because it has a strong exploratory aspect (Cresswell 2009), which is well suited to this work since little has been written about Canadian urban forest values in the literature. The research seeks to listen to and understand what the participants are expressing in terms of their values, preferences, and

learning processes in relation to Canadian urban forests.

In terms of data collection, the methods included a participant journal containing a questionnaire of both open and closed-ended questions, photo elicitation, and follow-up interviews, as described in Chapter 3. I carried out the site tours with participants and included time for exploring the site, writing in the journal, and taking photographs. As the participants traveled to different treed areas throughout the city in a half-day field trip, they were asked questions specific to the urban forests that they were visiting. The tours allowed participants to reflect on urban forest sites in Winnipeg, as well as their own learning processes, which in turn influences their value systems. It was essential to the project to conduct these qualitative processes within different types of urban forest ecosystems.

The data collected through this research are meant to add to our understanding of how residents of the city of Winnipeg value their urban forests and to help guide the management of Winnipeg's urban forest. As such, they also serve as baseline data for comparisons with residents' values in the other participating Canadian cities. Continual developments from urban forest research help to improve our knowledge base by increasing our awareness of people's relationship with the land (McPherson et al. 1997). This helps to document the role that urban forests play for urban residents, and those areas of study that need augmentation (Nowak et al. 2001). By increasing community attractiveness and sense of place, urban forests enhance quality of life and improve a city's ability to attract new business (McPherson et al. 1997).

1.4 Thesis organization

The thesis is organized into six chapters. Following the introductory chapter, Chapter 2 reviews the literature related to urban forests and their management, forest values, and individual and social learning in resources management. Chapter 3 details the approach used to collect data. Chapter 4 provides details on the urban forest in Winnipeg and peoples' association with it. Following this, Chapter 5 outlines the urban forest values held by participants. Finally, Chapter 6 provides conclusions and recommendations.

Chapter 2 Thinking about urban forests and forest values

2.0 Defining the urban forest

The urban forest is likely to be the most influential forest of the 21st century (Nowak et al. 2001; Dwyer et al. 2003). It can be defined as the natural and planted trees, their forest cover, and related components in urban areas (Ordóñez and Duinker 2010; Canadian Urban Forest Network 2010), including the associated vegetation and resources in and around dense human settlements, ranging from small communities in rural settings to metropolitan regions (Nowak et al. 2001; Miller 1997). Definitions have included treed areas such as: tree-lined streets, parking lots, school yards, downtown parks, riverbanks, cemeteries, freeway interchanges, transportation and utility corridors, and watershed lands (Miller 1997). These urban forest areas can include several components other than trees, such as pieces of green space and related abiotic, biotic and cultural components in and around cities and communities.

Many characteristics, such as structure, connectedness, and values, render the urban forests significantly different from hinterland forests (Ordóñez and Duinker 2010). The interconnectedness of the trees with their surroundings such as urban infrastructure and daily human activities render urban forests and their management both complex and dynamic. Urban forests support continuous nature-society interactions, composed of interactive anthropogenic and natural systems, which occur for residents on a daily basis (Nowak et al. 2001). The physical connectedness within urban forests is virtually opposite to that of hinterland forests, as urban forests are highly fragmented. Although possessing weak physical connections, the urban forests have a strong connection with urban residents, emphasized through the nature-society interactions. The urban forest

combines human development and natural ecosystems in one place and because of this the trees impact our decisions, activities, actions, and overall well-being of residents who live, work, and spend the majority of their leisure time within city limits (Ordóñez and Duinker 2010; Nowak et al. 2001). These forces can modify urban forests through direct and indirect human actions. Understanding the values held by humans in regard to nature and the urban forests is the aim of this study as values are powerful, reflect people's ideal objectives, and define which activities are acceptable (Loikkanen, Simojoki & Wallenius 1999), which in turn can have significant impacts on how urban forests are managed, for example through the development of bylaws.

2.1 The urban forest in Winnipeg

The urban forest consists of the sum of all street trees, residential trees, park trees and greenbelt vegetation, including trees on unused public and private land (Miller 1997). Because of the harsh climate and soil conditions in Winnipeg, the urban tree species most commonly found are White elm (*Ulmus americana*), Red ash (*Fraxinus pennsylvanica*), Manitoba maple (*Acer negundo*), Burr oak (*Quercus macrocarpa*), Poplars (*Populus* spp.), Basswood (*Tilia americana*), Willows (*Salix* spp.), Birches (*Betula* spp), Spruces (*Picea* spp.), Scots pine (*Pinus sylvestris*), and Eastern white cedar (*Thuja occidentalis*) (City of Winnipeg 2010). In Winnipeg, the total number of boulevard trees is approximately 280,000, with elm trees making up 40% of this total, all of which are publicly owned (City of Winnipeg 2010). The total number of trees in Winnipeg's urban forest is estimated to be eight million, with 160,000 elms, giving Winnipeg the distinction of having the largest remaining mature urban elm forest in North America (City of Winnipeg 2010). The monetary or economic value of Winnipeg's elm trees is estimated

to be 594 million dollars, not including property values (City of Winnipeg 2010).

Throughout the city, trees contribute in the order of 160 million dollars to the properties they enhance (City of Winnipeg 2010).

Winnipeg's extremely frigid winters and soil conditions limit the range of species able to thrive within the city (Tree Help Ltd 2007). Because Winnipeg developed along two river ecosystems the soil condition is a mix of base ridge and heavy clay soils. The American elm is ideal, as it is known for its qualities of being both beautiful and tough. It is able to resist road salt and the cold temperatures brought on by long winters. Winnipeg has a natural advantage because of its genetically diverse elm population, but citizen involvement has been a crucial component to Winnipeg's efforts to preserve the elm forest (Tree Help Ltd 2007).

The urban forest in Winnipeg has a long and unique history with its residents. The story of the famous Wolseley elm has been retold over the years and the tree has been known to exhibit many characteristics such as venerable, vulnerable, lovely, and controversial, provoking either furious indignation or appreciative delight from passing motorists (Winnipeg Free Press 1938). The Winnipeg Free Press (1938) and The Winnipeg Evening Tribune (1942) both made reference to the Wolseley elm, declaring that the controversial tree had come to symbolize different things to a number of residents. The elm tree was more than just a right-of-way or nature issue, it was a symbol of the open land that was once there, human victory over bureaucracy, and Winnipeg's own symbol of non-conformity. The tree stood as an independent symbol of a free land, where people may protest governmental decisions, and the women and lovers of the elm did protest, loudly and long (Winnipeg Free Press 1938). The stories told from the past

about the Wolseley elm demonstrate that in Winnipeg people have developed a strong attachment to their urban forest and have placed great value on the trees. Some have gone as far as saying the trees are part of our identity as a city (Tree Help Ltd. 2007). It is also clear that the neighbourhoods that house these old trees demand some of the highest market values in the city.

2.2 Values

Values help us define who we are and how we should act (Owen 2006). Values reflect people's ideal objectives and what kind of activity can be deemed acceptable, and thus they greatly influence and control our behaviour (Homer and Kahle 1988). Values define our actions and behaviour as good or bad, right or wrong (Satterfield 2001). Values as a social cognition facilitate adaptation to our environment, they guide us, informing us which situations to enter, which to avoid, and how to act (Homer and Kahle 1988). The value-attitude-behaviour hierarchy explains how situations are influenced, beginning with the formation of individual values, then to mid-range attitudes and finally leading to specific behaviours (Homer and Kahle 1988). Values do change, but in comparison with opinions and attitudes they change slowly (Loikkanen, Simojoki & Wallenius 1999).

A person's values serve as criteria from which evaluations are made and five assumptions can be made about the nature of human values (Rokeach 1973). These assumptions include that: (1) the total values that a person possesses is relatively small; (2) all humans possess the same values; (3) these values are organized into value systems; (4) human values can be traced to culture, society, institutions; and (5) personality and the consequences of our human values can be manifested in all phenomena (Rokeach

1973). Rokeach (1973) describes values by identifying two categories: assigned values, being those relative to the worth of an object; and held values, which incorporate enduring beliefs, specific modes of conduct, or ethical principles and which are personally or socially preferable.

Ordóñez and Duinker (2010) divide the value concept into two categories - assigned and existence values - as the human-nature value systems can be broad and flexible. Assigned values include those that are given by humans, while an existence value is a value in and of itself (Ordóñez and Duinker 2010). The two value categories are interrelated as the assigned values usually reflect a person's held values (Booth 1994).

Environmental values are related to the cultural and historical context of the current society (O'Brien 2005). The society's values are related to how people live and view nature and their relationship with it (O'Brien 2005). Values are a crucial component within environmental decision-making, as they provide the driving force behind interests and positions of the people involved (Moyer et al. 2008). Value literacy, an important component, is the ability of individuals to verbalize the values that best express why nature matters (Satterfield 2001). Urban residents may value their urban forests in three separate categories, including ecosystem, economic, and social (Ordóñez and Duinker 2010). For the purpose of this study, these are the chosen three categories that will be discussed in more detail in the following section.

2.3 Forest values

Forests provide an assorted range of benefits and these benefits increase human dependence upon forests (Beckley 1998). This dependence can occur at many levels, including individual, household, community, and regional (Beckley 1998). Both the

urban and hinterland forests provide a range of benefits and values at all levels.

Numerous past studies have identified the values and value categories associated with forests (Owen et al. 2009). These categories normally include a division separating the two main categories, such as instrumental and non-instrumental, material and non-material, and anthropogenic and biocentric (Owen et al. 2009). Moyer et al. (2008) describe the forest value typologies and forest value categories. The categories may include anthropogenic and biocentric, material and non-material, instrumental and non-instrumental, ecosystem outputs and amenity, and protection. There are hundreds of forest values that fit into one or more of these groups. Examples of forest values include, but are not limited to, ecological/environment, economic, recreation, aesthetic, cultural, intrinsic, spiritual, therapeutic, scientific, and respect and admiration (Moyer et al. 2008).

All community trees and forests are valuable, as they provide many values, goods, and services for the majority of the population in North America. Seventy-five percent of Americans (Coder et al. 1996; Nowak et al. 2001) and 80% of Canadians (Canadian Urban Forest Network 2010) now live in urban and suburban areas. These values can be thought of as a characteristic, component, or quality considered by an interested party to be important in relation to the identified forest element (Canadian Standards Association 2003; Ordóñez and Duinker 2010) and is realized by the people who own the trees, by people nearby, and by society in general (Coder 1996). Urban residents have the most contact with urban forests - they plant, maintain, conserve, and covet the trees because of their values and benefits (Coder 1996; Woodall et al. 2010). These benefits may stem from components and attributes of a single tree or can be derived from groups of trees functioning together (Coder 1996). The benefits can be listed in many arrangements and

are often divided into ecosystem, economic, and social categories (Coder 1996; Ordóñez and Duinker 2010). Essentially, the value of an urban forest is equal to the net benefits that society obtains from it (McPherson et al. 1997). Urban trees have numerous uses and functions ranging from obvious to obscure, and present several opportunities for improvement of urban living conditions (Miller 1997). The crucial idea is that humans (urban dwellers) learn and develop not a single-user value from community trees and forests, but multi-product / multi-value benefits.

Urban forests can have ecosystem benefits that help to mitigate urban environmental concerns by moderating climate, reducing building energy use, absorbing UV radiation and carbon dioxide, improving water quality, reducing flooding and erosion, and reducing noise levels (Nowak et al. 2001; Streiling and Matzarakis 2003). Not only do they provide ecological benefits they also have social benefits and can improve the urban resident's life (Ordóñez and Duinker 2010).

Although each value category is independent, circumstances may occur where the categories are intertwined and link with each other. The environmental or ecological benefits can also be associated as human, social, or health benefits. Much of the past research has only briefly discussed social values of the urban forest, and the focus of these discussions has been on health and recreational benefits with no in-depth examination or understanding of the values held and how they arose. The uses, functions, benefits, and values related to the urban forest will be discussed below in more detail. By having an understanding of the categories and what they entail, we can begin to interpret the urban forest values reflective of the residents of the city of Winnipeg. In some cases, residents may perceive there to be negative aspects or disbenefits associated

with the urban forest. Residents may believe negative aspects include: spider webs and insect larvae falling on passing walkers or cyclists, or vehicles covered with tree sap and falling leaves. The difficulties associated with tree care, pruning, and falling branches and clean up from natural occurrences such as windstorms and sewer problems may contribute to negative feelings towards specific trees and tree species.

2.3.1 Ecosystem values

The urban forest is an ecosystem characterized by the presence of trees and their related vegetation (Nowak et al. 2001). The benefits it provides are numerous, including a number of engineering functions (Miller 1997). The ecosystem values associated with the urban forest include air pollution removal, carbon capture, hydrological cycle and microclimate regulation, and wildlife habitat (Ordóñez and Duinker 2010; McPherson et al. 1997). The trees also reduce air temperature, increase air humidity, reduce wind speed, absorb air pollutants and particulate matter, reduce carbon dioxide, and reduce noise levels (Streiling and Matzarakis 2003).

The urban forest works as ‘green infrastructure’ (McPherson et al. 1997), providing numerous ecosystem benefits. The trees modify urban microclimates, which in turn affect human comfort and interior energy budgets of surrounding buildings (Miller 1997). Trees reduce certain air pollutants - large healthy trees have the ability to remove 60 to 70 times more pollution than small trees, providing residents with cleaner air, but the trees may sustain damage due to these pollutants (McPherson et al. 1997). If planted correctly, trees and shrubs can act like barriers to reduce unwanted sound (noise). Within urban centres, smooth, light-coloured surfaces along with artificial lighting can be bothersome to urban dwellers, and urban vegetation assists in mitigating this problem

(Miller 1997). Continuous development, construction, and resource overuse expose urban soils to wind and water erosion, but appropriate vegetation can considerably reduce erosion problems (Miller 1997).

2.3.2 Economic values

Economic values associated with the urban forest include benefits such as increased real-estate values, recreational values, income due to carbon dioxide sequestration, and air pollutant removal (Ordóñez and Duinker 2010). In economic terms, a value refers to the benefits and costs society derives from the urban forest (McPherson et al. 1997). The amount and type of benefit received is linked with the strategic planting of the trees (type, location, individual building characteristics) within urban areas, as there is a significant impact on the potential monetary savings based on these issues. The amount and type of energy savings associated with urban forests is site-specific, as individual characteristics vary within cities (McPherson et al. 1997).

Environmental economists have developed a taxonomy of values related to natural resources (Turner et al. 1994). These values, which are tied to public environmental goods, are generally classified as use values and non-use values (Konijnendijk et al. 2005). Both the use and non-use values can be divided further into smaller categories. Use values are split into consumptive and non-consumptive values, while non-use values are split into option, quasi-option, bequest, and existence values (Konijnendijk et al. 2005). The key use values connected with urban forests have no market price, and are characterized as non-consumptive use values. The benefits derived include a pleasant landscape, clean air, peace and quiet, recreational activities, reduced wind velocity, balanced microclimate, shading, and erosion control. The economic value

can be calculated through reduced costs of heating or cooling or alternative costs of environmental control (Konijnendijk et al. 2005).

The non-use values (option, bequest, existence) have been considered less significant for urban forest ecosystems in comparison to hinterland forests and the categories have not been specifically defined but have included values such as altruism, heritage, or existence (Konijnendijk et al. 2005). Option value is defined as individual willingness to pay (WTP) for ensuring the future availability of a particular amenity. Willingness to pay is a tool to determine value. Bequest values include a willingness to pay to preserve the urban forest as a resource for future users, and finally numerous urban parks have cultural and historical importance. Existence value results from the knowledge that the resources continue to exist and it is connected with the extinction of species (Konijnendijk et al. 2005).

2.3.3 Social values

Social values of the urban forest include positive psychological effects, aesthetic quality, emotional, and spiritual benefits (Ordóñez and Duinker 2010). The overarching concept describing the social values the urban forests convey can be divided into four categories: social benefits, communal benefits, recreational benefits, and health benefits. Each of the categories is interlinked and influences all the others.

Social benefits include the architectural and aesthetic benefits that can be observed fairly obviously by residents or passers-by. In general, urban dwellers are fond of trees and enjoy their presence, as they have a way of making life more pleasant, while providing restfulness and tranquility because of their beauty and peacefulness (Miller 1997). The stature, strength, endurance, and long life of trees such as the elm offer a

cathedral-like quality, allowing them to be planted as living memorials. Tree memorials are one characteristic generating strong personal attachments to the trees, leading to great resistance and heroic efforts to save many of the large or historic trees in cities (Miller 1997).

Urban forests offer pockets of green within a grey city landscape, generating positive impacts for both individuals and groups or communities (McPherson et al. 1997). Urban trees can be either publicly or privately owned, but even if the trees are private property, their size renders them a part of the community (International Society of Arboriculture 2005). Many communal benefits of large urban trees are related to their leaf area (McPherson et al. 1997). Because a single tree can occupy a considerable amount of space, careful planning is required so that each tree benefits all parties (International Society of Arboriculture 2005). With proper selection and maintenance, trees can enhance and function on one property (or several) without infringing on the rights and privileges of neighbours. Architectural and engineering functions provided by the trees include privacy, emphasizing views or screening out objectionable views, reducing glare and reflection, and directing pedestrian traffic (International Society of Arboriculture 2005).

As so many Canadians live in urban areas (Canadian Urban Forest Network 2010), many of our outdoor recreation experiences occur within cities. In urban parks and woodlands, wildlife can become a significant component of the recreation experience (Miller 1997). Urban trees and their associated vegetation provide unique recreational enjoyment not found in other environments. Trees as colours, shapes, sounds, textures, odours, tastes, and touches are responsible for providing urban residents with numerous

recreational pleasures (Miller 1997).

As the costs associated with transportation continue to rise, travelling to the hinterland forests in rural areas is becoming more expensive, rendering urban forest recreation more attractive. Such recreation has the potential of improving overall quality of life and with any luck providing additional and higher quality green spaces for urban residents to enjoy (Dwyer 1982). The notion of urban residents seeking outdoor recreational experiences beyond city limits has been well documented (Miller 1997). On the contrary, urban residents, especially the elderly, handicapped, young, and poor, make infrequent use of forests outside city limits in comparison to time spent in urban forests (Dwyer 1982).

While improving quality of life within cities, the benefits urban forests contribute are countless (Konijnendijk et al. 2005). Four elements known to affect physical human comfort can be influenced by trees: solar radiation, air movement, air temperature, and humidity and precipitation (Miller 1997). Urban forest can improve air quality as the leaves take up many pollutants that can cause serious health problems, e.g., ozone, nitric acid vapour, nitrogen dioxide, ammonia, sulphur dioxide, and particles (aerosols and dust) (Konijnendijk et al. 2005). The trees and their leaves also provide shade from the sun to protect against exposure to ultraviolet radiation.

The recreational activities facilitated by urban forests are linked with health benefits, by promoting a healthy active lifestyle, which positively improves public health. Urban forests are also important for those residents who are restricted in their mobility: the elderly, sick, and young. All these groups can benefit through exposure to the aesthetic qualities and natural scenery of the urban forest (Konijnendijk et al. 2005). The

urban forest can make a positive difference in the quality of life of the majority of urban residents (Dywer et al. 2003). Visiting these natural areas in the city can create a stress-reducing environment, with greater relaxation and faster recovery influencing residents' everyday life (Konijnendijk et al. 2005).

2.4 Learning for sustainability

Over the past few years, a great amount of literature has developed which identifies learning as a necessary component for achieving sustainability and/or implementing sustainable development (Sinclair et al. 2008). Social and ecological sustainability is dependent on our capacity to learn and respond to changing circumstances and situations (Keen et al. 2005). Such learning can, for example, increase public knowledge about urban forests and their sustainability allowing for greater public participation in their management. Participatory planning and management events may also prove to be successful platforms for learning.

Transformative learning is one theory describing adult learning. Transformative learning has the ability to produce change in the learner eventually influencing the learner's subsequent experiences (Mezirow 2000; Collins 2008; Kerton and Sinclair 2010). The learning theory places focus on how individuals learn to negotiate and act on their own purposes, values, feelings, and meanings in order to obtain an increase in control over their lives as socially responsible decision-makers (Mezirow 2000). The learning processes transform problematic frames of reference (sets of fixed assumptions and expectations) to render them more inclusive, discriminating, open, reflective, and emotionally able to change (Mezirow 2000; 2003). The transformed assumptions and expectations are superior as they are more likely to create beliefs and opinions that prove

true or justified to guide future actions (Mezirow 2003). A fundamental notion of transformative learning is the individual's ability to critically reflect on personal beliefs, assumptions, values, and actions, as well as on those of others (Kerton and Sinclair 2010).

There are two main domains to the transformative learning theory: instrumental learning and communicative learning (Mezirow 2000). Instrumental learning entails controlling and manipulating the surrounding environment or other people (Mezirow 1993), with emphasis on improving prediction and performance (Mezirow 2003). It involves assessing truth claims with hypothetical developmental logic using deductive and empirical methods (Mezirow 2003). Communicative learning generally includes people's values, ideals, moral decisions, feelings, and normative concepts that are not able to function through empirical testing as the individual is learning what people mean (Mezirow 1993). Qualitative approaches are more appropriate for understanding communicative learning, as the developmental logic includes abductive reasoning (Mezirow 2003).

Transformative learning includes participation in constructive discourse, which refers to dialogue involving the assessment of beliefs, feelings, and values (Mezirow 2003). Through participation, the experiences of others can be used to assess reasons justifying assumptions, and a decision can be formed based on the resulting insight (Mezirow 2000).

2.4.1 Learning, public participation, and natural resource management

Natural resources represent different things to different people, such as income, hobby opportunities, experiencing solitude and tranquility, protection from the wind,

pollution or erosion, aesthetic values, intrinsic values, and property values (Loikkanen et al. 1999). Public participation is essential in planning as decision-making requires taking a stand on what values are acceptable, or worthy of striving toward (Loikkanen et al. 1999). This participation has the ability to strengthen the democratic fabric of society (Sinclair et al. 2008), while providing opportunities for non-formal education such as transformative learning (Fitzpatrick and Sinclair 2003). A fundamental learning step towards more sustainable environmental management requires an increase in our understanding of the human-environment interactions (Keen et al. 2005). As past research has demonstrated, the adoption of a more sustainable lifestyle in North America will require a fundamental shift in our values, yielding adult learning as an essential part in creating this change (Kerton 2007). Keen et al. (2005) emphasize that the social learning approach to environmental management involves a combination of personal learning, community engagement, collaboration, and partnerships with the organizations providing resources. At the Natural Resources Institute, social and individual learning takes the focus within an abundance of the current and past research underscoring the need to consider learning in resource and environmental management research.

2.4.2 Learning, participation, and management of the urban forest

Trees have been recognized as valuable community assets (McPherson et al. 1997). This supports the notion that proper management is essential for receiving the maximum amount of benefits. Urban forestry, the management of the urban forest is considered to be "...a specialized branch of forestry and has as its objectives the cultivation and management of trees for their present and potential contribution to the physiological, sociological and economic well-being of urban society..." (Jorgensen

1974). This definition of cultivation, management, promotion of awareness, and education encompasses trees, forests, green space and related resources and their planning, planting, protection, maintenance, and care for present and long-term protection (Deneke 1993), and involves “the making and carrying out of decisions concerning the location, characteristics, and use of urban forest resources” (Dwyer 1982). Urban forest management is crucial, as the forest is situated where the majority of the human population lives, works, and spends its leisure time (Nowak et al. 2001).

Urban forest management is critical to the sustainability of the urban forest itself. Dwyer et al. (2003) define urban forest sustainability “in terms of maintaining healthy and functional vegetation and associated systems that provide long term benefits desired by the community”. This definition highlights the role of urban residents in providing for urban forest sustainability, as they are the individuals who are the managers and users of the urban forest (Dwyer et al. 2003; Nowak et al. 2001). Scientific research has documented that urban forest benefits and costs are critical elements and must be known by residents in order to further develop support and participation in community forestry (McPherson et al. 1997). Miller (1997) discusses the economic and legal values of the urban forests, but he does not consider the urban residents and how they value the urban forest. The lack of understanding and the unknowns about how and what the public values about its urban forests provides justification for this study to develop understandings of the types of values held by residents and how they were learnt.

Unfortunately, the full array of benefits derived from the urban forests is not fully articulated in land-use decisions, green-space policy-making, and residents’ views (Konijnendijk et al. 2005). A fairly conventional method for integrating resident views

concerning forest management is the participatory planning approach through which local residents are provided an opportunity to influence the way the urban forests in their communities are managed (Tyrväinen et al. 2003). The participatory planning method may increase the planning costs and there is uncertainty in how well the group of individuals involved in the planning will work together, and if they represent the opinions and values of all users. The sample may be too small to be representative of the general population and it may attract certain types of people who dominate the planning process, potentially leading to mismanagement of the urban forest (Tyrväinen et al. 2003).

2.5 Summary

Urban forest ecosystems are characterized by the presence of trees and other related vegetation in association with people and their developments (Nowak et al. 2001). Within these urban areas, many of the trees have been planted outside of their natural range, making up diverse populations with both native and non-native tree species (Woodall et al. 2010).

Many studies have been conducted to measure the benefits of trees in urban areas (Streiling and Matzarakis 2003), but there are opportunities to increase our understanding of people's relationship with trees, as the urban forest is largely created and maintained by people (McPherson 1997). Because urban forest management needs to be people-oriented (McPherson 1997), it is essential to have a comprehensive understanding of people's values and how they have come to learn and develop these values, which ultimately impact their behaviour. Values guide individuals in their actions and behaviours while representing their beliefs. As outlined above, it can be helpful to organize the values people hold into three main groupings: ecosystem values, economic

values, and social values. Through learning about these values, we may be able to evolve management systems for urban forests to promote sustainable actions and improve sustainability.

Chapter 3 Methods

3.0 Research strategy and rationale

In qualitative research, the paradigm or world-view with which the researcher identifies is often linked to the chosen strategy of inquiry and ultimately the chosen research methods. In my case, I identify with the paradigm of social constructivism and my chosen strategy of inquiry for this research is phenomenology.

Social constructivists hold the key assumption that individuals seek an understanding of the world in which they live and work, and they therefore develop subjective interpretations of their experiences or meanings directed toward certain objects or things. The goal of the research constructivist is to rely as much as possible on the participants' views of the situation being studied (Creswell 2009), fitting well with my research. The more open-ended the methods the better, with a focus on specific situations in which people live and work, with the researchers recognizing that their own backgrounds shape their interpretation. The researcher's intent is to make sense of (or interpret) the meanings others have about the world (Creswell 2009). Phenomenology is linked within the social constructivist paradigm as the researcher seeks to focus on a concept or phenomenon and its essence, understand the meaning of the experiences, and rely as much as possible on the participant's views while keeping personal biases aside.

Qualitative research can be an exploratory and useful tool when the principal variables to examine are unknown. Importantly, a qualitative approach is appropriate when a concept or phenomenon needs to be understood because little research has been done. It allows for room to be innovative and to work more within researcher-designed frameworks, allowing for more creativity within the methods selection, and the use of

literary-style writing (Creswell 2009).

Creswell (2007) explains that phenomenological research attempts to identify and understand a lived experience (Connelly 2010; Simpson 2007; Amedeo 1997). Although qualitative research, including phenomenological research, has many positive characteristics, Goulding (2005) raises a critical limitation: there is only one legitimate source of data, that being the participants' views and experiences. While this can be seen as a limitation, I believe that the researcher can ensure data trustworthiness and rigor in the research by reducing or avoiding this problem through triangulation and other approaches.

The data can take many forms and can be collected through a variety of techniques, including interviews, observations, journals, art, poetry, music, taped conversations, formally written responses, drama, films, poetry, and novels (Creswell 2007). Because of the qualitative nature of the strategy, the process of data collection is flexible and innovative, which includes the role of the researcher, who examines the essence of an experience. This can be captured through interviews, stories, or observations with the individuals who partook in the experience (Connelly 2010).

Using phenomenology as a strategy for my research fits well because my data collection methods include a participant journal, which included questionnaires, formal written responses or structured interview questions for the participants, along with photo exercises to elicit the values the participants hold towards the urban forest, as well as follow-up interviews to have detailed discussions of the photographs. The phenomenon consists of the urban forest, which the city dwellers (of Winnipeg) experience on a daily basis. The data described the "what" and "how" of participant experience and the values

placed on the urban forests in Winnipeg: “what” the participants consider as an urban forest and “how” they value the urban forest. The flexibility of using a qualitative study, a phenomenological strategy, and a mix of research methods allowed me to understand, describe, and create a composite of the participants’ experiences with urban forests.

3.1 Data collection approach

To elicit resident values of the urban forest and develop a comprehensive understanding, many methods, including sidewalk surveys, questionnaires, site tours, photo elicitation and interviews, were used. Each method is described in detail, following the overview below.

A central component of this study was a half-day field tour of Winnipeg’s urban forests. At the beginning of the day, the study participants received a participant journal to take with them and complete throughout the tour. Participants took a tour of several urban forest sites in the city and each site characterized different scales and ownership and represented the urban forest diversity in Winnipeg. While at each site, the participants answered open and closed-ended questions specific to the urban forest site as well as initial and concluding questions regarding the urban forest and its management. Each participant was given a camera to take photographs of what he or she valued most about the urban forest at each site. At the end of the day, participants were asked to take the cameras home with them and take photographs in their own neighbourhoods, or other places to further capture the values they hold in relation to the urban forest and that are not represented in the photos they took during the field tour. Follow-up interviews were scheduled to discuss the photographs taken on the site tours and later by the participants. The follow-up interview allowed the participants to explain the focus and aim of each

photograph and to prevent my misinterpretation of the photographs. The interviews also allowed participants to become engaged in a discussion of how they developed and learned the values held towards the urban forest sites in their photographs.

Various methods were used to recruit a diverse sample of Winnipeg residents for participation in the research. Posters and signs were put up in areas of high pedestrian traffic such as street lampposts, shopping mall and grocery community notice boards, information boards, coffee shops, and local parks. From this, snowball recruitment was also used through my advisory committee contacts, online advertisements, and e-mails.

Participants needed, and were given time to take the photographs, but interviews were scheduled as soon as possible after the urban forest site tours. The interviews focused on learning and development of values held towards the places in the photographs along with questions that encouraged a discussion regarding the management of the urban forest.

3.1.1 Urban forest site selection

After an examination of how the literature defines and describes urban forest ecosystems and other Canadian urban forest value research, discussions with my advisor, and committee members, six sites were chosen for the participant half-day field tour. The sites reflected a range of urban forest ecosystems in scale, size, ownership, and biodiversity. Logistical order and locations of the sites within the city provided an efficient tour with as little driving time between sites as possible. The route began at the site furthest from the starting point and worked its way back towards the central meeting point. At each site, participants were asked to record in their journals any reflections, observations, and feelings they had about the site. While taking participants on the tour, I

also made notes of what I was experiencing, and took pictures. Here, I will give a brief discussion of each site to provide a general understanding of the type of site and some of my observations. Pictures taken by participants from each site coupled with the discussion will help in capturing the environment and surroundings.

Many describe the urban forest in Winnipeg to be like no other, with the largest remaining mature elm forest (City of Winnipeg 2010) and more parks per capita than any other city in North America (Burchill 2010). These unique qualities contribute significantly to the streetscape and urban forest. Winnipeg is home to over 900 residential-area parks and 12 major regional parks; in total more than 4,000 hectares of parkland (Burchill 2010). When combining all street trees, residential trees, park trees and greenbelt vegetation, including trees on unused public and private land (Miller 1997), bushes, shrubs, and undergrowth we have a unique urban forest ecosystem.

The first tour destination was Assiniboine Forest in Winnipeg's south end. Due to construction the front entrance and pathways into the forest were closed for the summer. As a result an alternative entrance off Shaftesbury Avenue was used for the site tours. Because of its location, Assiniboine Forest is not as accessible as other sites. The automobile is the main source of transportation to and from the forest, with public transit and active transportation (walking, jogging, biking) as secondary sources. Assiniboine Forest exemplifies many important aspects of the urban forest in Winnipeg; it is one of the few remaining areas of aspen parkland in Western Canada and is one of the largest urban nature parks of its kind in Canada (City of Winnipeg 2012). While participants were only able to experience a small piece of the park because of time constraints, Assiniboine Forest encompasses 287 hectares of aspen parkland and 283 hectares of

forest, marsh, and wildlife. The Forest houses many plant and animal species including a herd of white-tailed deer. In 2012, Assiniboine Forest was nominated as one of the “greatest” places in Canada (CBC News Online 2012). Each visit to Assiniboine Forest brought with it a quiet peaceful atmosphere. While participants roamed the trails, I sat at the trail crossroads enjoying nature, listening to the birds, insects, and faint sounds of the passing traffic. Many trail users passed me by with a friendly ‘good morning’ and on the third visit to the forest, a past participant who frequented the space stopped to chat and was both eager and excited to see that I had been able to bring more residents to the space she had enjoyed so much.



Plate 1. Site selection: Assiniboine Forest

The second site, Wildwood Park, is a community neighbourhood with the front yards serving as a communal space shared by the residents. It is a residential development unique to Winnipeg and Western Canada (Manitoba Recreational Trails Association 2012). The neighbourhood was developed in 1948 with central walking

trails and multiple parks allowing pedestrians to easily avoid vehicular traffic. The layout of the area is unlike the majority of other residential developments in Winnipeg: the houses, green space, and park space are integrated, giving pedestrians various walking paths and putting vehicles in a secondary role (Manitoba Recreational Trails Association 2012). Pathways, benches, picnic areas, and children's play structures scattered throughout the neighbourhood are all protected by large trees and their overarching canopies, and all vehicular traffic diverted to back lanes behind the homes, leaving the communal space safe and free from the negative impacts of vehicles (traffic, noise, smells, pollution). The site tours were my first experience of Wildwood Park, and like many of the participants I was quickly intrigued with the layout of the space. Even though each tour date was characterized by a sunny morning, the canopies of the many trees shaded the majority of Wildwood Park, leaving us to enjoy a cool spot. On our first visit, the play structure was full of loud playful children, but a walk down the path meant the noise became faint in the distance. Because all traffic is diverted behind the homes, walking through Wildwood Park resembles walking through cottage properties, with no traffic and plenty of greenery.

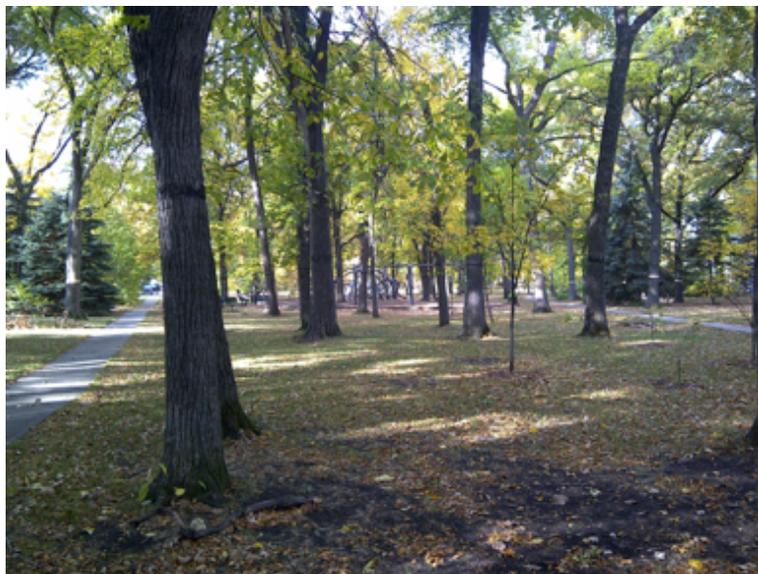


Plate 2. Site selection: Wildwood Park

Site three, located on one of Winnipeg's exclusive river stretches, was a private homeowner's front and back yards on Wellington Crescent. The neighbourhood runs along the Assiniboine River and the homes have large yards. A boulevard pathway lined with mature elegant trees provides shaded canopies for the many cyclists, walkers, and joggers choosing to travel down the pleasant street. Wellington Crescent, minutes away from downtown Winnipeg, is a fairly high-traffic street except on Sundays when the street is closed to automobile traffic, making it a pedestrian- and cyclist-friendly area. The specific site visited supports a number of trees including an Ohio buckeye (*Aesculus glabra*) and a Hackberry (*Celtis occidentalis*) and a diversity of other species. Because of its location, the sounds of passing traffic continuously interrupted the peaceful environment provided by the diversity of trees and other vegetation at the site. On the tours, participants spread themselves throughout the property, each finding a tree to sit under or lean against while reflecting and filling in the journals.



Plate 3. Site selection: Private homeowner

Site four was Sherbrook Avenue, located in central Winnipeg in the neighbourhood of West Broadway, just minutes from downtown. The neighbourhood and street have been undergoing revival projects over the past three to five years. New businesses have established and the area is developing into one of Winnipeg's fascinating neighbourhoods. Sherbrook is a tree-lined street adjacent to Winnipeg's Wolseley neighbourhood, which is famous for its elm trees. The tour stopped at a small community garden project at Sherbrook and Broadway because of the available benches and areas to sit for ease in completing the journal entries. Like site three, Sherbrook was loud because of the continuously passing automobile traffic, as the space mainly serves as a thoroughfare into downtown Winnipeg. The trees did not seem to be the main focus of the street, which was made apparent by the grey colours dominating over the greens of nature.

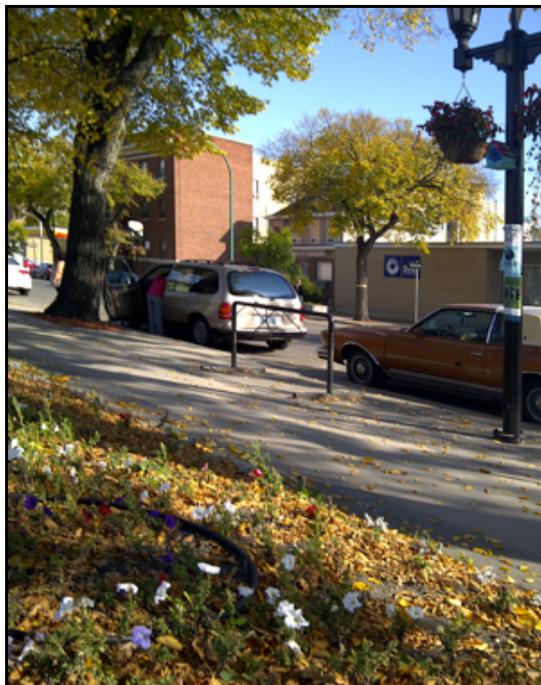


Plate 4. Site selection: Sherbrook Ave.

Site five, the front courtyard at the University of Winnipeg, located centrally in downtown Winnipeg and positioned on Portage Avenue, is a manicured expanse with a front lawn, trees, bushes, flower planters, rose garden, benches, picnic tables, and a basketball court. The courtyard provided numerous seats and places for participants to relax. Because of its central location, the site is surrounded by tall office buildings and is accessible by all forms of transportation; walking, cycling, public transit, and private automobiles. The bus stops located at the front of the courtyard on Portage Avenue contribute to the large amount of pedestrian traffic along and through the courtyard. One of the first things I noticed when stopping at the University of Winnipeg was the green manicured lawn, even with the heat and drought of summer, the lawn was full and green. The site was highly manicured with many newly planted trees, along with an old large tree overarching a large portion of the front lawn.



Plate 5. Site selection: University of Winnipeg

The final site, locally known as Garbage Hill or Green Hill, is located next to Westview Park in north Winnipeg and was formerly a local garbage dump. It has been transformed into a public space that provides a place for recreation, tobogganing in the winter, exercise, picnics, dog walking, and a vantage point from which to view the urban forest looking east towards downtown Winnipeg. At the top of the hill, if you pause and take a moment to look east to Winnipeg's West End, you see more trees than anything else, but turning 180 degrees and looking west, the view drastically differs. Instead of trees, the area is blanketed with grey from the industrial businesses, buildings, and the Winnipeg airport. The view from Garbage Hill is similar to the view when flying into Winnipeg and although quite windy, it allowed participants to sense the trees in Winnipeg as a collective entity. On numerous occasions, I was able to overhear the awe from participants as they overlooked Winnipeg's West End.

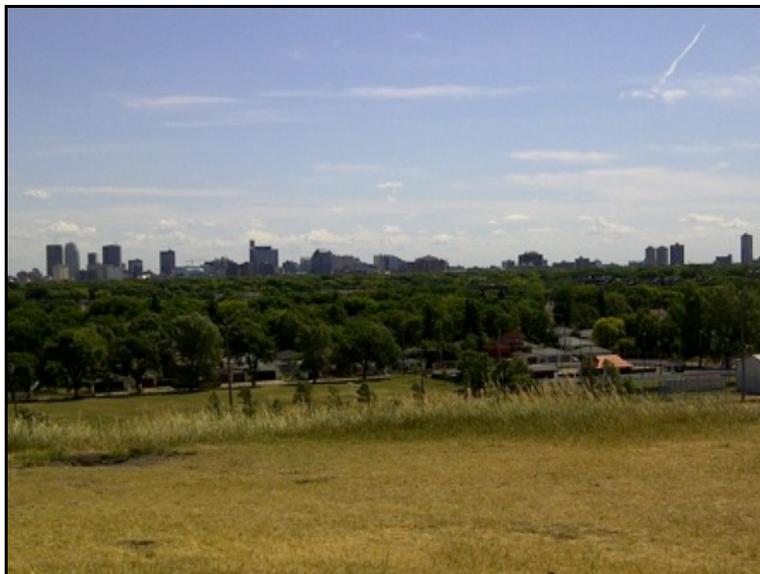


Plate 6. Site selection: Garbage Hill

3.1.2 Half-day urban forest site tours

I organized and carried out four site tours, one each on August 23, August 25, September 24, and October 2, 2011. The first two tours took place during the week (Tuesday/Thursday), with the latter two occurring on the weekend. Participant numbers were as follows, on August 23rd six participants, on August 25th five participants, on September 24th nine participants, on October 2nd four participants. Additional tour dates had been scheduled, but did not take place, as it was necessary to work in conjunction with participant availability and cancellations. The hot and dry summer experienced in Winnipeg brought with it perfect weather for the site tours, but also caused recruitment challenges as the summers in Winnipeg are short and residents want to take advantage of their free time. The warm sunny weather, dry conditions, and lack of mosquitos yielded almost perfect conditions for the morning tours. These conditions continued into the fall months and because of this it was possible to schedule a tour date in October, where

participants were able to experience the change in seasonal colours of Winnipeg's urban forest.

On the morning of the site tours, participants met with me at a centrally located commercial parking lot. The location was chosen because of its central location, ease of parking (bike and vehicle), proximity to a major bus route, and the final site tour stop was minutes away. Participants were asked to meet at the location by 8:30 am; at this time the consent forms and participant journals were handed out, followed by a short explanation of the morning's tour. The field tours started promptly at 8:45 am and we arrived at the first location by approximately 9:00 am. Participants were not told in advance the locations of the sites visited to minimize potential participant bias.

We spent approximately 20-30 minutes at each site. Additional time was spent at site one (Assiniboine Forest) and site six (Garbage Hill) allowing extra time for participants to read through and fill in Part A and Part B of the participant journal and for a picnic lunch at the end of the morning. During the time spent at the sites, participants were allowed to roam around and explore the site before they began to fill in their journals. Numerous reminders were reinforced to everyone that the journal was an individual task. Participants were asked to refrain from group discussion until they had completed their journal entry, and they would have time at the final site over lunch to fill out any missed questions or areas of the journal not complete on the tour. Snacks, juice, and water were provided on the tour and, if necessary, stops were made at toilet facilities. A picnic lunch took place at the final site while participants finished their participant journals. On some occasions, informal discussions took place regarding the morning tour. People also shared thoughts on the trees and urban forest in Winnipeg.

Sandwiches, cookies, vegetables and dip, fruit, granola bars, water and juice were provided for the picnic lunch. Any allergies or food preferences were accommodated as best as possible. The site tour and lunch wrapped up by approximately 12:45 pm and participants were taken back to our meeting place by 1:00-1:30 pm.

3.1.3 Participant journals

As the participants traveled to the urban forest sites, they had questions to answer and participant journals to complete. As Appendix C shows, the journal starts with a set of initial questions to gather first impressions, followed by questions specific to the urban forest site visits. It concludes with a final survey and any last impression comments. The participant journal contained both open- and closed-ended questions. The open-ended questions allowed respondents to recount personal insights, understandings, experiences, and opinions in their own terms and in greater depth than the closed-ended questions (Hay 2005). The closed-ended questions allowed for the collection of quantitative data regarding respondent attributes, attitudes, and opinions of the participants (Creswell 2009; Hay 2005).

3.1.4 Photo elicitation

Photo elicitation as a qualitative method has recently become increasingly prominent in studies regarding place attachment and sense of place associated with recreational or natural spaces (Stedman et al. 2004). Harper (2002) describes and defines photo elicitation in its simplest form, the idea of inserting a photograph into a research interview. A study by Loeffler (2004) is one of the first to use photo elicitation as an interview process asking study participants about their connections to outdoor experiences. The study contributes to the methodological understanding of photo

elicitation by using the photographs taken by participants to initiate and continue the interview process between the researcher and the individual, further enforcing that methods other than pens, paper, and tests can provide useful findings about participant experience (Loeffler 2004). Harper (2002) also contends that photo elicitation brings added validity and reliability to a word-based survey through the act of taking and presenting an image. Photographs taken by research participants help stimulate reflection and “the express aim of exploring participants’ values, beliefs, attitudes, and meanings and in order to trigger memories, or to explore group dynamics or systems” (Taylor 2007). Stedman et al. (2004) suggest researchers can move beyond considering photographs as supportive data; instead, the images are expressions of the ideas themselves.

Beckley et al. (2007) discuss the usage of resident-employed photography (REP) as a method to elicit sense of place values held by residents for specific areas within Canadian communities. Beckley et al. (2007) yield a positive contribution to the use of photography as a qualitative method to elicit values regarding biophysical and sociocultural attributes within Canadian communities. They show that photo elicitation can be used to uncover values that participants hold for the urban forest within their own community, which then can be compared to other communities across Canada.

Beckley et al. (2007) place emphasis on the advantages of using REP along with follow-up interviews to complete the data collection, but there may also be limitations such as logistical challenges and the possibility of swaying the participants. The interviews are, however, crucial to ensure that the photographs are interpreted correctly. There may also be ethical dilemmas highlighted by Fang and Ellwein (1990) such as

confidentiality, informed consent, informant reactions, corresponding narratives, and conceptual control of the field worker. These dilemmas relate to the use of photographs as evaluation data and must be fully considered by the researcher before data collection and analysis take place.

Photography is a familiar and enjoyable activity for study participants, and can increase willingness to participate and engagement with the activities (Stedman et al. 2004). Participants were given 27-image disposable cameras and asked to take photographs on the site tour and on their own time after the tour. The instructions given to participants were simple, so they did not unduly influence what the participants photographed. They were told to be as creative as they would like, to simply take pictures of things that help to reveal their held urban forest values at specific locations of their choosing. The participants took photographs while touring the urban forest (at each site location if they chose), and also took photographs on their own time at places not visited on the tour. When meeting for the interview, initially participants were asked to group the photographs into high, medium, and low importance. Some participants chose to use one, two or all three of the groupings, while others reworded into high/medium groups. Throughout the interviews when describing photographs, the word “value” was often interchanged with words such as ‘like’, ‘enjoy’, ‘appreciate’, but participants frequently expressed a high importance or high value to the urban forest ecosystems.

Participants’ own photographs included locations all over Winnipeg. Many took pictures of their own yard, street, or neighbourhood. Others took photographs of spaces they frequented daily such as parks, riverbanks, and open spaces in and around Winnipeg.



Plate 7. Urban forest locations in Winnipeg: King's Park



Plate 8. Urban forest locations in Winnipeg: Vimy Ridge



Plate 9. Urban forest locations in Winnipeg: Near home

3.1.5 Participant interviews

An interview can be defined as a face-to-face verbal interchange in which one person elicits information from another person (Hay 2005). Throughout the interview process, the researcher has control over the data-gathering process and the ability to assist in probing and motivating respondents (Rea and Parker 2005). The interviewer can administer highly complex questions because of his or her ability to clarify any questions or concerns expressed by the participant (Rea and Parker 2005).

To discuss the photographs taken by the participants and to understand better the values they hold in relation to the urban forest, a semi-structured interview took place with each participant. The majority of the interviews were audio-recorded but a few of the participants asked not to be recorded, instead notes were taken. My aim was to keep the interview as open ended as possible, to allow it to flow more easily. The interview schedule (Appendix D) included questions such as: Where is this picture? Why did you go to this urban forest site? What is the focus of the picture? What do you value most about the urban forest site in this picture? How did you come to develop your values?

The interviews focused on the learning and development of values held towards the places in the photographs taken by the participants along with a discussion regarding the management of the urban forest. During the interview, the participants were asked to group their photographs into high, medium, and low groupings taken on the site tour as well as the photographs they took on their own. The groupings represented the pictures that best captured their most important values of the urban forest to their least important. A specific set of questions was asked for each grouping of photographs. After a discussion of the photographs, the participants were asked general questions regarding

their urban forest values, and finally questions on urban forest management in Winnipeg.

3.1.6 Urban forest sidewalk survey

Myself and a fellow student at the Natural Resources Institute also carried out an urban forest sidewalk survey in the summer of 2011, as a part of the larger urban forest values research project. The questions in the survey sought to establish participants' views on the trees in Winnipeg. They were conducted at five urban sites in Winnipeg. The sites were chosen for various reasons such as location, pedestrian access (pedestrian-friendly areas that had high foot traffic throughout the day), amount of trees, park setting, and diversity of residents. Participants were chosen by simply walking up and asking if they had a few minutes to talk about the trees in Winnipeg. The surveys required approximately three minutes of respondents' time, although most of interviewees were eager to provide more-detailed explanation in their responses and the surveys took an average of five minutes to complete. The surveys consisted of ten structured questions (see Appendix F). Two hundred and sixty two sidewalk surveys were completed over a period of eight weeks. Interviewers also recorded date, time, weather, and location of every interview, and recorded if the respondent was male or female.

3.2 Data analysis

Creswell (2009) presents a general interactive procedure of the steps occurring in data analysis. The first step is to organize and prepare the data for analysis, and then read through and obtain a general sense of the data. Step three involves coding the data, which is the process of organizing the material before bringing meaning. The coding process allowed me to generate a description and themes for analysis. The themes are represented in a narrative in the thesis and finally an interpretation of the data is made to

discover lessons learned, compare findings with literature or theory, or the data may suggest new questions to be asked.

The participant journals and interview transcripts were transcribed and entered into a qualitative research software program, Text Analysis Markup System (TAMS), where the data were coded into theme areas. The quantitative data generated through the participant journals and from the sidewalk survey were entered and analyzed using common spreadsheet software. Through coding, I developed common topics, themes, and concepts that were then organized into hierarchies of values. It was useful to keep in mind the use values and non-use values characterizations connected with the urban forest, to help organize, code, and develop themes within the data. The use values associated with the urban forest have no market price and are characterized as non-consumptive use values. Benefits include pleasant landscape, clean air, recreation, and environmental benefits (Konijnendijk et al. 2005). The non-use values include values such as altruism, heritage, or existence (Konijnendijk et al. 2005). These two main value groupings served as a starting point when examining and analyzing the values derived from the residents who participated in the study.

3.2.1 Trustworthiness of the data

Lincoln and Guba (1985) established criteria to ensure trustworthiness of qualitative research. The criteria encompass credibility, transferability, dependability, and confirmability. When combined, the criteria demonstrate truth, applicability, consistency, and neutrality of the research. Validity and reliability are also criteria that contribute to conducting a sound research study and if disregarded may compromise the quality of the data.

To ensure the trustworthiness, validity, and reliability in this research, a literature review was performed that underpinned the development of the research purpose and objectives. Multiple data sources including both qualitative and quantitative sources such as short- and long-answer journal questions, a participant survey, and post-tour interviews were collected which allowed for triangulation of the data. The quantitative data were cross-referenced with the qualitative data to establish connections and make comparisons by examining the responses from the different data sources. The participant journal data and the interview data were also cross-referenced and examined for discrepancies and similarities. Dissemination of the results to participants will provide merit and confirm the research results.

Chapter 4 Local perceptions of an urban forest

4.0 Introduction

As the majority of Canadians are urban dwellers (80%) (Canadian Urban Forest Network, 2010), the opportunity for people to make connections with the urban forest are abundant, and can include physical, intellectual, emotional, and psychological connections. These connections may occur with boulevard trees, backyard trees, treed parks, and other urban treed areas. This chapter begins to explore these connections as it delves into the data collected from the participant journals, setting the foundation for an in-depth look at participants' held urban forest values. As explained in Chapter 3, participants were taken on site tours and given the journals as a way to expose participants to the different urban forest ecosystems in and around Winnipeg. The journals aimed to explore what constituted the urban forest in their mind and to begin to establish the values that they associate with it, as this was the first time the majority of participants had thought about the "urban forest". This work underpinned the photo elicitation exercises, discussed in Chapter 5, which delved more deeply into the participants held urban forest values.

4.1 Defining the urban forest

After examining the urban forest literature, the bulk of the definitions of the urban forest contained several of the following ideas, including all natural and planted trees, forests, green space, and related abiotic, biotic and cultural components found in and around cities and communities of all sizes including large metropolitan areas and small towns or communities (Canadian Urban Forest Network 2006; Canadian Urban Forest Network 2010; Ordóñez and Duinker 2010; Nowak et al. 2001; Miller 1997). The first

objective of this research was aimed at peering into the understanding residents have of the urban forest in Winnipeg – a local perception of what the urban forest is. Participants were asked to describe what they would consider to be an urban forest and to try to provide examples of this from their Winnipeg experience. Participants provided their own urban forest definitions in their participant journals, some of which are listed below.

An urban forest would range from a preserved natural site (undisturbed) to a managed site, with a significant human presence. In all cases they would include trees, shrubs, understory and a/some compliments of fauna (P13).

Urban Forest: Got to be a treed area within city limits (P1).

I have always thought of an urban forest as the whole collection of trees in the city-boulevards as well as parks (P5).

A group of trees and associated undergrowth that are similar to a “natural” forest (or a natural forest that has been preserved) (P8).

Not surprisingly, ‘tree(s)’ was mentioned by 21 of 24 respondents in their definitions of the urban forest. In two cases where trees were not specifically mentioned, the participants chose to use ‘forest(s)’, and a single response definition included the idea of “a park or dedicated green space within a city intended to preserve a natural component...” Associated components of the urban forest were mentioned in ten of 24 responses and included elements such as ‘wildlife’, ‘plants’, ‘undergrowth’, ‘vegetation’, and ‘humans’. In all instances, participants referred to the urban forest as something that is plural, that one single tree cannot be considered an urban forest but that it is a collection or grouping of trees. In explaining this, people indicated things like ‘a stand of trees’, ‘group of trees’, ‘collection of trees’, and ‘treed area’.

The social aspects of the urban forest definition were mentioned by many participants and included urban, human, or city elements within responses. Sixteen of 24 responses included elements such as ‘city’, ‘cityscape’, ‘city limits’, ‘recreation’, ‘human presence’, and ‘housing development’. The final idea considered within the definition responses related to planting and/or management. One of the major undertakings of urban forestry is the management and cultivation of the urban forest, which includes planning, planting, retaining tree populations, protection, maintenance, and care of trees, forests, green spaces, and related resources (Jorgensen 1974; Deneke 1993). ‘Planted/managed’ was mentioned only twice, and the majority of participants did not include or define urban forest areas based on how the trees became established, whether they were naturally occurring, or planted/managed by humans.

In response to identifying the urban forest in Winnipeg, eighteen participants noted specific and general urban forest locations. General locations included boulevard trees, front and backyards, treed properties, or anywhere there are trees. Specific examples encompassed many parks and open spaces in Winnipeg: The Harte Trail, Assiniboine Park, Assiniboine Forest, FortWhyte, Living Prairie Museum, Kildonan Park, St. Vital Park, Little Mountain Park, Stanley Knowles Park, Kings Park, trails along the Red and Assiniboine rivers, and the lawns at the legislative buildings. As discussed above, Part A of the participant journal asked participants to describe what they considered as an urban forest and to give examples found in Winnipeg. Just over half of participants - 15 of 24 - listed specific examples of urban forests; these examples included locations and areas from across Winnipeg.

Boulevard trees, front yards, parks, backyards, treed properties (P2).

The lawns of the Legislative building, the trails along the Red and Assiniboine Rivers, Little Mountain Park, the park at the corner of Main Street and Assiniboine Avenue. (behind Fort Garry Place) (P20).

Assiniboine Forest, Forte Whyte, and the Forest behind the Living Prairie Museum (P3).

Parks. i.e., Kings Park, Assiniboine Park (P14).

The responses of participants correspond with the examples of locations specified within the urban forest literature. The literature presents the urban forest as the natural and planted trees and all of their associated resources found within urban areas, including street trees, residential trees, park trees and greenbelt vegetation, including trees on unused public and private land (Miller 1997; Nowak et al. 2001; Ordóñez and Duinker 2010). The literature also acknowledges the importance of trees growing on private lands, as they compose the majority of the urban forest (Clark et al. 1997). While the locations given by participants represent public and private ownerships, as well as all scales of urban forest ecosystems in Winnipeg, several participants struggled with the urban forest issues associated with ownership, accessibility, beneficiaries (who benefits?), the size or number of trees that make up an urban forest, and the appropriate or suitable balance between the urban elements and nature. These issues will be revisited and discussed in the section below.

4.1.1 What constitutes an urban forest

In an attempt to further ground some of the definitions that people offered, they were asked to indicate whether they thought certain locations (see Tables 1 and 2) within the city were representative of the urban forest. This question also allowed participants to start to think and reflect on what the urban forest might be before starting on the field tour. Participants were asked for their views at two points in the field journal – in Part A before the field tour started and in Part B while visiting the urban forest sites.

In Part A of the short-answer questions, 23 of 24 participants considered Assiniboine Forest as an urban forest (see Table 1). Part B of the long-answer questions presented different results; after visiting the sites, 22 of 24 participants considered Assiniboine Forest as an urban forest (see Table 2). When answering Part B, participants P17 and P19 believed Assiniboine Forest was not an urban forest, citing its location (not in the centre of town) as their reason for not considering it an urban forest and not because of its forest characteristics: *“no because it is in suburbia”* and *“because it’s really suburban around here, only housing and schools”*. This is interesting, since the forest is surrounded on three sides by residential development and has the CP main line on the other side and is clearly closer to downtown than so many of the parks people identified as being urban forest.

A second interesting discrepancy to be noted occurred when participants were considering the university campuses. In the short-answer questions of Part A, eight participants considered the University of Manitoba campus as an urban forest, but only four participants considered the University of Winnipeg campus as an urban forest. The most logical reasons for this discrepancy would seem to be that the University of

Manitoba is located in Winnipeg's south and is surrounded by suburban neighbourhoods and is well treed, while the University of Winnipeg is located in the heart of downtown Winnipeg and, while there are trees, the University property is covered mainly by buildings. There is also a large difference in campus size in terms of number of students, buildings, and green space.

Table 1. Defining the urban forest (Short Answer, Part A)
Do you consider this place as an urban forest?

Consider as an urban forest?	Assiniboine Forest	Kildonan Park	Assiniboine Park	University of Manitoba	The Forks Market
Yes	23	17	19	8	5
No	1	4	4	14	18
N/A	0	3	1	2	1

Table 2. Defining the urban forest (Long Answer, Part B)
Do you consider this place as an urban forest?

Consider as an urban forest?	Site #1 Assiniboine Forest	Site #2 Wildwood Park	Site #3 Private Yard	Site #4 Sherbrook Avenue	Site #5 University of Winnipeg	Site #6 Garbage Hill
Yes	22	14	7	5	4	14
No	2	10	16	19	20	10
Borderline	0	0	1	0	0	0

4.1.2 Views of the urban forest in relation to the site visits

Part B of the participant journal asked if participants thought the site was an urban forest ecosystem; Table 2 illustrates the quantitative responses. The qualitative written responses provide reasoning for the participant's choices. On the site tour, the first two sites visited were more heavily treed than the remaining sites, most resembled a completely natural space, and were most like a hinterland forest with less human or urban influence than sites three to six. Sites three to five had fewer trees and more concrete, and there was an increased presence of urban elements and human interference such as

roads, businesses, automobile traffic, picnic areas, and concrete planters. On the final site, while the site itself was bare of trees, the panoramic view looking east offered a great overview of the urban forest with the downtown area actually looking heavily treed, while to the west there is an industrial development and the airport.

The first location for our morning tour was Assiniboine Forest and the site that most resembled a hinterland forest. Reasons why respondents felt the site was an urban forest fell along the following lines:

This area had a large quantity of trees and other vegetation such as wildflowers and prairie grass. This is different than other forests because the perimeter and beyond is an urban area (P3).

This space remains as “untouched” as possible. While the paths have been developed by humans, there is a larger “divinely inspired” feel to the rest of the scene (P24).



Plate 10. Site visits: Assiniboine Forest

Site two, Wildwood Park, conveyed a unique atmosphere and experience each time the tour visited. The first tour stop on August 23 at Wildwood Park had a very different atmosphere than the final three visits. The portion of the neighbourhood used for the tour had a large children's play structure and on the first tour the play structure was full of children, portraying the space as busy and loud. Although the community was occupied with families on each visit, the additional three visits to the site had a quiet and peaceful atmosphere. Slightly over half (14 of 24) of participants considered Wildwood Park as an urban forest while ten participants did not, an interesting finding given the park-like nature of this urban development. Respondents who felt that Wildwood was an urban forest said things like the following and took images as captured below:

It's preserving nature and in a natural state (P20).

The integration of green space and trees is an urban forest (P2).

Yes. All these houses look like they're living in harmony with the park. There are beautiful sidewalks running through it. There is the forest and there are homes (P16).

Yes. While this site has more human intervention than Assiniboine Forest, it nevertheless offers a similar sense of the restoration of serenity to my soul (P24).

Those who did not consider the site an urban forest said things like:

I think this is a green space but not a forest. I think it would require many more trees and should be more removed from the residential community to be a forest. It doesn't support 100% natural wildlife due to the houses surrounding it (P23).

No natural understory, too modified (play structure, sidewalk etc.) (P8).

No, I would consider this to be a park area or a green space, not an urban forest. This area has trees, which are a typical characteristic of a forest but its lacking other plant species, for example, prairie grass, moss, shrubs, flowers, sounds of insects and animals (P3).

No, there are too many human objects: play structure, benches, houses (P11).

No, to me this is a park, much more human development and landscaped space (P18).



Plate 11. Site visits: Wildwood Park

The third site, a private home on Wellington Crescent, had a high amount of passing traffic on the first two tour dates because these dates fell during the week, while the final two visits took place on a Saturday and Sunday. The Sunday tour proved to be the quietest as Wellington Crescent is closed to vehicle traffic on Sundays. Seven participants considered the property to be an urban forest and 16 did not. One participant considered the site as ‘borderline’ because she believed the trees were not the most prominent feature at the site. Reasons highlighting why respondents felt the site was an urban forest fell along the following lines:

Yes, micro urban forest (P15).

Provides all the elements described in A (trees provide support for each other as well as for humans, wildlife and plants) (P4).

Those who did not consider the site an urban forest said things like:

Because urban forests usually aren't private in my definition. My backyard is heavily treed but I still don't consider it an urban forest (P1).

In front of the yard there is a road and a considerable amount of car traffic. I think an urban forest needs to be quiet (P16).



Plate 12. Site visits: Private homeowner's yard

Site four, a stop on Sherbrook Ave. in Winnipeg's West End, had heavy traffic at all times of the week. Many of the trees in the area had been banded to prevent cankerworm damage, while one tree across from the stopping point was dead and marked for removal. The vehicles parked along Sherbrook Ave. made it difficult to experience and have a clear view of the large trees lining the street. Only a small number of participants considered Sherbrook Ave. as an urban forest (5 of 24), and the majority did not believe it to be (19 of 24). The small number of responses considering it as an urban forest reflected different urban forest values:

The trees were deliberately put here and have to be maintained and they increase the value I have in this space (P17).

Because the trees are providing shade, beauty, and tranquility (P4).

Those who did not consider the site an urban forest said things like:

Because there is cement and asphalt on the ground and the trees are too isolated from each other (P9).

Busy street, not a lot of trees, lots of traffic. Very developed with lots of buildings and businesses (P6).



Plate 13. Site visits: Tree-lined street (Sherbrook)

Site five, the front courtyard at the University of Winnipeg, had varied levels of vehicle and pedestrian traffic. The number of academics, staff, and students was significantly lower on the weekends than during the week, and compared to the main school year (September - April). Sunday was the quietest morning, as downtown businesses had not yet opened for the day. Four participants considered the courtyard to

be an urban forest while 20 participants did not. Respondents believing the site was an urban forest reflected ideas such as:

There are trees here that contribute to nature (P21).

Self contained green space within campus boundaries (P15).

Yes, because the trees were deliberately put here and have to be maintained and they increase the value I have in this space (P17).

Those who did not consider the site an urban forest said things like:

It's a park because the trees and flowers are surrounded by big buildings, busy car roads and people. The grass and flowers are not wild type, they are all planted in order to make the city look more pretty (P12).

Not really, it has trees but is too developed, traffic (cars) and concrete to feel like a forest (P13).



Plate 14. Site visits: University campus

The final site, Garbage Hill or West View Park, gives users a colourful overview of the tree canopies concealing the homes and buildings of central Winnipeg. The hill attracts users for numerous recreation purposes at all times of the week. Fourteen participants considered the hill as an urban forest and ten did not. Participants were reminded that the view was what they were being asked to consider as opposed to the garbage hill site itself. Participants believing the site to be an urban forest discussed the trees as a grouping or collection and said things like:

The city itself is in a forest (P7).

It may be an illusion, but seeing all the trees collectively makes it look like an urban forest (P22).

Yes because from this view it looks like a forest. Also because collectively (all the trees, grass, insects, animals) from this view would make up a forest (P3).

Yes, it is a distributed urban forest (interconnected) sub groups of urban forest (P15).

Yes. When you have a top view of the trees in downtown Winnipeg you can see how it might be considered a forest. You actually see more trees than houses. However, from street view you may not have such an appreciation for a forest space (P23).

Those who did not consider the site an urban forest said things like:

The city isn't a forest but looking from up here it looks like it. Too much human interference (P18).



Plate 15. Site visits: View of Winnipeg from Garbage Hill

4.1.3 Reflecting on what constitutes the urban forest

Participants took many factors into consideration when deciding what they thought constituted an urban forest. When participants did not consider a space or a place to be an urban forest, the main reason given was that there was too much human interference. So, despite there being ‘trees’, which was central to their definition, many did not consider a place to be an urban forest if it was disturbed or highly managed. For them, this interference rendered the spaces as being too unnatural due to elements such as vehicles (traffic), concrete, roads and buildings.

In some cases, participants began with and used their own definition of an urban forest and compared the tour sites to this definition. For example, participant P4 defined the urban forest as being “*Where trees provide support for each other as well as for humans, wildlife and plants.*” In considering the Wildwood Park and Homeowner sites, this participant indicated: “*Provides all the elements described in A (trees provide support for each other as well as for humans, wildlife and plants)*”.

While a few participants had an ideal definition to work with, others were conflicted and provided responses both in favour of a site being an urban forest and against the same site. An example of this conflict can be found within the responses of participant P5 and the responses regarding site four (Sherbrook Ave. location), and participant P9 and the private homeowner's yard.

Site 4 Sherbrook Ave.:

No- Boulevard trees on major streets hasn't made me think of it as a forest- however in stopping to think of the whole city as an urban forest. It's obvious this is part of it (P5).

Site 3 Private homeowner's yard:

This one is kind of borderline for me, because the trees aren't necessarily the most prominent feature here (P9).

For other participants, their views and own ideas or definitions about the urban forest have changed since participating in the research or changed during their participation in the urban forest site tour. By asking participants to take a moment to be attentive to what they were experiencing at each site, it became possible for participants to reflect thoughtfully on their own urban forest values, which will be discussed in depth in Chapter 5. This time for critical thinking, reflection, and discussion allowed participants to begin constructing new, more-inclusive meanings and definitions. These internal struggles were particularly apparent in considering site three (private homeowner's yard) as an urban forest, as exemplified by P24 as the forest tour proceeded.

Not really, in my "usual" definition although it is a place that values and protects and nurtures trees and contributes similar benefits to the environment on a smaller scale (P24).

Can you describe what you would now consider as an urban forest?

I have expanded my concept of an urban forest over the course of this morning. My initial concept would have been most aptly illustrated by a place like Assiniboine Forest, but now includes a wider range of treed areas (P24).

4.2 Participants' associations with the urban forest

Considering the participants' associations with the urban forest helps to clarify further participants' understanding of the urban forest, the values they associate with, and provides data related to understanding how citizens' values differ in relation to various scales and ownerships of urban forest ecosystems. All participants believed that the trees in Winnipeg provide benefits, have importance, contribute to the quality of life in Winnipeg, and are valued. Participants were able to identify values and benefits received from the urban forest sites as outlined in Chapter 5. To understand urban forest associations, questions in the participant journal and the follow-up interview aimed to elicit how these associations were shaped. Formation of associations included factors affecting quality of life, benefits, and reflection on the importance of trees.

4.2.1 The draw of the urban forest

Why are people drawn to urban forest places - perhaps for recreational, social, spiritual, or health purposes? For some, it is likely a part of their daily routine to drive, bike, or walk down a street, but in fact they are consciously choosing streets that have a higher quantity of trees. Many residents have the option of commuting down streets that are exactly the same except for the number of trees, so why then do they pick the treed streets? Participant P19 emphasized this awareness by stating "*I choose to drive down this way as opposed to a treeless street*". Choice of street for a daily commute is a high priority, especially for those using active transportation (walk, bike, jog, etc.).

Participants indicated that they consciously choose to commute through/by treed streets because of their benefits such as the shade and shelter of the trees. Indeed, these ordinary streets are transformed because of the beauty and lushness of the trees. The participant responses demonstrate how important the tree-lined streets are to the atmosphere and character of Winnipeg.

My own street/neighbourhood is tree-lined and I think they help make Winnipeg unique (P8).

Because I need to get to another location (so I use the streets...) if I'm driving this place doesn't hold importance to me but the fact that there are trees makes the ride easier and calmer (P10).

I visit places like this on my daily commute. Streets like this with mature trees are important because they provide a lot of character (P22).

There are several tree-lined streets in Winnipeg that I drive down on a routine basis. It is great that the city does this and it would be difficult to find a street without trees (P23).

Normally I drive down streets like this to get somewhere without thinking about how different it would look without trees. Very important to city to keep a focus on areas like this and plant replacements where trees have been removed (P5).

Participants indicated that they visit urban forest places for many other reasons.

For some, the spaces serve as a source of spirituality, or the urban forest sites serve as an easy, convenient 'get away'. These 'get aways' are foundations for numerous recreation purposes for example to socialize through activities such as picnics, barbeques, and group exercise, or to provide access to nature and a breath of fresh air. The rationale given by participants indicates the positive contribution that the urban forest makes to their quality of life. Below are examples of why residents visit the urban forest from each location of the site tour.

Assiniboine Forest:

I visit here for escape from the city atmosphere. They provide a sense of calm and visual change (P22).

Wildwood Park:

We chose to raise our family in this area, and now my eldest son and his wife have chosen to raise their family here. The environment feeds and nourishes me with past memories, present sensations and future promises (P24).

Private yard:

A beautiful yard is a joy to behold. I think governments should encourage people to maintain nature in their yards through different ideas like “gardens not lawns” which promotes urban agriculture (P20).

Sherbrook Ave.:

I live on a street like this, but streets with trees lining streets are way more pleasing than those without. Well-designed boulevards with trees can be very pleasant places to walk and cycle along (P13).

University of Winnipeg:

I visit this place to read a book, try to feel nature in the city (P12).

Garbage Hill:

Nice to view the city from up high and makes you relax your mind (P21).

Urban residents find time to experience urban forest ecosystems because their quality of life is enhanced by the benefits they provide. Participants said that the urban forest is an aesthetically pleasing, natural place to walk, cycle, relax, and get away from the urban elements of a city. They even went as far as mentioning their desire to spend an increased amount of time in the urban forest spaces “... *I don't often visit but I wish I could more*”. Many of the reasons participants visit places are linked to why they believe these places have importance on an individual and community level.

4.2.2 Why treed places are important

Participants could easily describe reasons why they believed a treed place was important to them, the city, or both, and responses included social, ecological, and economic rationales. Whether participants had regularly visited or spent time at specific sites, or had never been there before, the list of responses provides numerous rationales for why urban forest ecosystems are important to residents.

The trees allow all residents to experience the feelings associated with the natural environment, green space, and nature. Social importance included aesthetic, health, and sense of community responses, among others. Participants wrote about the beauty and the pleasant and unique atmosphere produced by the urban forest, including how the boulevard trees “*frame the streets*” and contribute to building a sense of pride, to community, and to the overall cityscape. Participants were able to explain how the urban forest improved their own health in that urban forest ecosystems are “*important for our body, mind, spirit*”. Mentally the urban forests construct a healthy and positive image that can be appreciated throughout all seasons. The spaces offer safe places to get away or escape from the busy city life, allowing for vision, outlook and perspective, or simply a positive reminder of back home in the countryside.

The urban forests also are responsible for incremental improvements to the quality of life for all residents because of their ecological and environmental benefits. Ecological importance consisted of broad and detailed responses from specific benefits provided by the trees such as oxygen, shade, wildlife habitat, shelter, protection, pollution control, green-house gas absorption, water absorption, carbon storage, and increase overall air quality.

This space contributes to everyone's quality of life in Winnipeg because it provides oxygen and stores carbon dioxide in the leaves. It provides habitat for migrating songbirds, waterfowl, small mammals and deer. It adds a place for Winnipeggers to get outside and enjoy nature whether it's walking, jogging, biking or even walking their dogs. Hopefully a recreational space like this encourages Winnipeggers to be active and appreciate the beauty of trees and forests (P2).

Some felt that any green space with trees is special because each “*incorporate[s] nature into the city*” and nature is a nice bonus in a city.

It helps to remind people that we're not the only things trying to live here (P3).

It's nice to realize that our city isn't just a big slab of concrete and be able to view the many trees that surround us (P6).

Boulevards without trees are even less welcoming. The trees especially those with big canopies provide shade. Thankfully Winnipeg does have many streets with trees along boulevards (P13).

Economic importance was not often touched on by participants, but it was mentioned that the trees are “*making commercial transactions more pleasant*” suggesting residents will most likely choose locations of the city with a higher amount of tree cover over commercial districts that are overwhelmed with concrete and asphalt. Participants also discussed that the shade from the trees not only contributed to personal well-being values, but also to cost-saving benefits through the cooling of homes and buildings.

...They shade the buildings and that, so if you did have air conditioning you wouldn't have to have it on as much... (P1).



Plate 16. Sherbrook Ave.: The benefits of shade

In some cases, the urban forest site quality-of-life contributions are limited because of their location and accessibility. Although these sites provide environmental benefits for all residents of Winnipeg (oxygen, air quality, carbon sink), their social benefits may be limited to the people living adjacent to the sites. Wildwood Park does not provide social benefits to a resident living in Transcona; Assiniboine Forest may be difficult to access for a resident who lives in the north end and does not have access to a vehicle. Participants' reflections led them to question Wildwood Park as a luxury that not all residents can experience: "*this is amazing, but is it a luxury?*"

Participants were able to address numerous categories in which the trees and the urban forest improve our quality of life aesthetically, socially (health, emotional, recreation), and ecologically (air quality, water, pollution). In many cases the 'importance to you' stated by the participants can be transferred to importance on a citywide scale. The individual ideas listed have the ability to benefit other individuals and families and contribute to the overall importance of the urban forest ecosystems. For

example, individual ideals of the importance of the urban forest such as air quality and pollution control or physical exercise and recreation apply at the citywide scale and contribute to building healthy communities. A further discussion of participant associations with the urban forest will be discussed in Chapter 5, when examining people's associations, connections, and values of the urban forest.

4.2.3 Reflections, observations, and feelings

While spending time at each urban forest site, participants were asked to take a few moments to experience the atmosphere and to describe any reflections, observations, or feelings they had about the place. Generally, the sites were believed to be good places to come and think, relax, and experience nature in the city. At Assiniboine Forest, participants reflected on feeling stress-free, peaceful, happy, and relaxed. Observations included that the space felt fresh, smelt clean, was quiet, and appeared fragile. One participant took the personal thoughts further and reflected on urban growth and how each new development alters the relationship and interactions between humans and urban forest ecosystems, making their management complex.

Forest is “encroaching” urban development or development is encroaching the forest? (P15).

Participants sensed that Wildwood Park appeared to have achieved a balance of nature and homes that any resident would enjoy and if more people were aware of this type of residential design, more would aspire to live in such a neighbourhood.

I envy that these occupants are able to live in an area that has totally integrated an urban forest into their living space (P1).

While visiting Sherbrook Ave., like many of the tree-lined streets in Winnipeg that are designed to move people to and from their destinations, participants acknowledged the beauty, ecological, and social benefits the trees add when driving, cycling, and walking around Winnipeg. The trees make a more comfortable walk by breaking up the wind, and without the trees the streets would be hot in the summer and even colder in the winter.

I love the treed streets. It's one of the things I love about Winnipeg (P7).

When we arrived at the last stop of the morning, Garbage Hill, many participants were surprised that the city looks so green from above.

It gives a good perspective on how many trees we have in Winnipeg. The contrast between urban setting and all the trees. Bigger population (macro perspective) of trees (it appears) than when we're up close (micro perspective) (P3).

While the idea of the sixth site (Garbage Hill) was to get participants to focus on the view, they also observed certain negative elements and believed the site to be loud, with the sounds of traffic distracting. One participant described it as “*chaotic*”, as the trees are not the centre of attention, but the cars, people, and noise are.

4.3 Urban forest quality in Winnipeg

How the urban forest is managed can be linked to the quality of the urban forest in Winnipeg. Participant P8 took time throughout the interview to reflect on the public ownership, how the trees in Winnipeg are managed, and the quality of the urban forest in comparison to another North American city.

...Yeah probably, like maybe some cities don't put as much of a priority on it or I know just from visiting other cities, I never thought about this till we started doing your tour and your project here but it seems like other cities rather than having things spread out like we do in Winnipeg where there are trees along pretty much every boulevard and is, like Chicago for example I went there last summer and it seemed like, I don't know if this is true or not but it seemed like they had several major park areas and then the rest of the city was just pure concrete. Whereas here, not only do we have those areas, we have boulevard trees all over the place and I think that's the public idea of it being an important thing for the city or the province. (P8).

Participants were asked to rate the condition of the urban forest in Winnipeg, either 'poor', 'o.k.', 'good', or 'excellent'. Eleven of 24 and 10 of 24 participants scored the urban forest as 'o.k.' and as 'good' (Table 3), leaving a considerable amount of room for improvement. The next steps would be to acquire an understanding of the types of improvement residents feel are necessary for urban forest quality in Winnipeg.

The quality of the urban forest can also be linked with its management and the number of trees. So participants were asked if they thought there were enough, too few, or too many trees and forests in Winnipeg. In both cases the majority of participants thought there were too few trees and forests in the city (Table 4). It also should be noted that 11 of 24 participants felt that there were enough trees in the city, but from Table 3 we can see that quality as an issue. Certain responses from participants reflected issues of both quantity and quality of the trees and forests in Winnipeg.

Trees:

Too few. The city is losing about 3% to 4% of the Elms every year to Dutch Elm Disease (DED). Now with threat of the Emerald Ash Borer (EAB), we could lose more of our boulevard trees...there are other cities, which have many more trees, i.e., Atlanta, Georgia. It looks like a forest when flying above, except for the skyscrapers downtown.

We can definitely plant more trees in Winnipeg (P2).

Forests:

Too few. We can always do with more forests. With all the new housing developments occurring in Winnipeg, there is more room to increase the urban forest especially when for some of development to occur they are removing the existing trees/forest. Also, with the flooding that has occurred along the rivers the past few years, we are losing some of our beautiful river bottom forest, simply because of high water levels. The trees are literally drowning because the roots are submerged in water too long (P2).

Although only 24 participants partook in this research, when asked about the amount of trees and forests in Winnipeg, 30 and 26 responses were given, respectively (Table 4). This is because many participants took a moment to critically reflect which allowed for a complex response, eventually leading them to give more than one response. Several participants felt that specific areas in the city had enough trees while other neighbourhoods did not. In most cases, when participants felt there were not enough trees, they were referencing the newer developments in Winnipeg; here is what participant P1 said: *“enough: in established areas; this ‘enough’ only working if the dying/diseased trees are replaced. Too few: In new developments”*.

Table 3. The urban forest condition in Winnipeg

What do you feel is the quality of the urban forest in Winnipeg?	#	%
Poor	1	4%
O.K.	11	46%
Good	10	42%
Excellent	2	8%
Total	24	100%

Table 4. Trees and forests in Winnipeg.

	Amount of TREES in the city?	Amount of FORESTS in the city?
Enough	11 (37%)	1 (4%)
Too Many	0	0
Too Few	19 (63%)	19 (73%)
Don't Know	0	2 (8%)
No response	0	1 (4%)
N/A	0	3 (12%)
Total	30	26

The sidewalk survey conducted over the same summer provided an additional data set to further understand our values and concerns regarding the trees in Winnipeg. A discrepancy between the two data sets occurred when examining responses regarding the number of trees in Winnipeg. When asked about the number of trees just over half (59%) of the respondents from the sidewalk survey believed there to be enough trees in Winnipeg, and only 37% of participants from this research study believed there were enough trees in the city, while 63% responded that there are too few. This discrepancy may have occurred because of the amount of time available for reflection. Respondents for the sidewalk survey were approached at random and asked to answer a short survey, while participants in the tour-based study had signed up in advance and had the entire morning to reflect about their answers. A prevalent similarity within the two data sets related to urban forest quality is the concern of the health of the elm tree population in Winnipeg. In both cases, respondents mentioned Dutch elm disease (DED) or tree banding when asked about their urban forest concerns.

4.4 Summary

A comprehensive understanding of what participants defined as an urban forest derived from various part of the research. Participants were asked to develop a

definition, they were asked if they considered certain places in Winnipeg to be an urban forest, and at each site location they were asked if they believed that the site was an urban forest and asked to explain their beliefs. From these multiple inquiries, it was possible to get a good sense of what participants considered is an urban forest, and equally important, what is not. Within their urban forest definitions, participants incorporated the ecological and social aspects, including the biodiversity, and cultural components or human elements.

When reflecting on urban forest definitions, participants took many factors into consideration including number of trees, scale, human interference, and ownership. General urban forest locations given by participants included boulevard trees, front and backyards, treed properties, or anywhere there are trees. Specific examples encompassed many parks and open spaces in Winnipeg: The Harte Trail, Assiniboine Park, Assiniboine Forest, Forte Whyte, Living Prairie Museum, Kildonan Park, St. Vital Park, Little Mountain Park, Stanley Knowles Park, Kings Park, trails along the Red and Assiniboine rivers, and the lawns at the legislative buildings. The main issue that arose from the participants' definitions and considerations was finding an appropriate balance between urban and natural elements. While the urban forest literature acknowledges the presence of urban elements (Nowak et al. 2001; Dwyer et al. 2003; Ordóñez and Duinker 2010; Miller 1997), many participants did not believe a site to be an urban forest if the trees and their associated vegetation were not the primary focus. For participants, urban forest sites must preserve natural elements and be free of urban interferences, so they had to be more like a park. The types of elements that influenced people's sense of the urban forest included roads, cars, and businesses, while urban elements such as homes and

recreational facilities were acceptable unless the trees were not the primary focus. While the literature on urban forests (Canadian Urban Forest Network 2010) considers single trees and their associated resources as part of the urban forest, participants felt at least a small grouping of trees was necessary to form an urban forest ecosystem.

When asked to describe their reflections, observations, and feelings about the urban forest sites visited, participants focused on how they were positively affected by the ecological and social services experienced at the site. Participants spoke less of the economic values, placing their focus on the urban forest as a natural space for improving quality of life. The urban forest ecosystems provided places to sit and think and relax, to experience nature in the city. The trees provided fresh air, shade, and shelter from the wind and the rain.

The associations made by residents with the urban forest are unique to other natural ecosystems because the benefits of the urban forest are felt not only by the owners, but also by the entire community. The connections made between residents and the urban forests are unlike hinterland forest connections because the beneficiaries live within the forest (Canadian Urban Forest Network 2006). Within my research, associations, connections, and rationales for why participants would visit the urban forest varied, but participants believed that the trees in Winnipeg generated numerous benefits while providing contributions to the quality of life in Winnipeg, and are valued.

Participants gave examples such as the following:

It's a great place to come in the evenings and relax, to a walk, places like this hold special meaning to me, as it's a place to escape the busy and hectic pace of everyday life (P2).

I like to visit places like this because it is an old and majestic urban forest (P4).

Chapter 5 Our urban forest values

5.0 Introduction

This chapter builds on the perceptions, primary reflections, and basic urban forest values of participants discussed in Chapter 4, and includes an examination of the held urban forest values, their development, and the processes in which learning has occurred. As discussed in Chapter 3, values were elicited from participants at different stages throughout the research, including through the participant journal responses and interviews, which will be discussed further in this chapter and through an examination of the data collected in the photo elicitation exercise.

5.1 Urban forest values

Our basic values are limited in number, but represent our social and biological needs (McFarlane and Boxall 2000; Roakeach 1973). These values provide an important basis for understanding, maintaining, and influencing attitudes and connections towards relevant objects, in this case, the trees and the urban forest ecosystems (Tarrant and Cordell 2002; Richardson 2008). Because our value-attitude relationships and connections are strong they may have the ability to affect our behaviour, rendering management of the urban forest an essential component of urban quality of life.

Values reflect our ideal objectives, influence, and control our behaviour (Homer and Kahle 1988). Urban forest values are composed of characteristics, components, or qualities considered by an interested party to be important in relation to a forest element (Canadian Standards Association 2003; Ordóñez and Duinker 2010). The 'interested parties' may be urban residents who cultivate the strongest relationship with urban forests as they plant, maintain, conserve, and covet trees due to the values they hold about the

benefits trees and forest offer (Coder 1996; Woodall et al. 2010). The connections made to the urban forest are strong and influential, and can include physical, intellectual, emotional, and psychological benefits. These connections can occur with urban forests of various scales and sizes including boulevard trees, backyard trees, treed parks, and other treed urban areas. Written and surveyed responses from participants support the importance of these connections. When surveyed, all participants agreed that a connection to nature is important to them. Further, a quote from participant P1 reinforces the important idea presented in urban forest literature, that for many residents the urban forest is the only forest ecosystem they will ever experience (Nowak et al. 2001).

*When my parents moved here as immigrants in 1957... one of the only things I remember is going to a little park... my dad and mom found a little park right away and then our outings for my whole childhood were at Assiniboine Park, we all piled on the bus with a cooler and off we went to Assiniboine Park, so those were, that was are only recreation. **My parents did nothing else, they never had a car, we never went to the beach they did nothing; our only recreation was our urban forests (P1).***

The next section will highlight the themes and values residents hold in relation to the urban forest. Participants noted that trees contribute to a natural form of privacy and act as a barrier, increase property value, reduce noise and energy consumption, and keep cooling costs down in the summer. They also indicated that trees provide shade and are a source of green/greenery in the city, serving as a “*reminder of what needs protecting*”. They also felt that a diversity of trees supplies homes for other living things, as well as reducing disease, and they are a source of biodiversity within an urban setting, allowing natural vegetation the freedom to take care of itself. Urban forest ecosystems instigate calming effects and people venture to these places to be uplifted, quiet, and tranquil, or to find a sanctuary away from chaos and traffic. The psychological impacts of natural

ecosystems provide a *“cognitive space here is again a historical, timeless, more mental space to inspire, ignite creativity”*. Participants reflecting how the urban forest is a source of beauty to an urban setting repeatedly put numerous aesthetic values forward. One described the urban forest as a *“beautiful area that incorporates community living and a natural space”*. The trees provide a sense of nature with the ability to re-connect residents to the natural landscape; *“it is somehow comforting to see how many trees actually grow in our city”* and can contribute to a *“healthy environment”* to enable health and fitness while promoting positive neighbourly relations.

5.1.1 A discussion of our urban forest values

Seventy-nine value codes generated 967 expressions of value elicited from the participant journals and interviews. The twelve top mentioned codes were ‘natural’ (95), ‘recreation’ (65), ‘aesthetics’ (48), ‘shade’ (48), ‘beauty’ (39), ‘alternative uses’ (31), ‘tree size (aesthetics)’ (29), ‘view’ (29), ‘escape’ (26), ‘diversity’ (24), ‘urban forest connection’ (24), and ‘wildlife’ (24). The 79 value codes were organized into six value themes: aesthetics, naturalness and biodiversity, environmental quality and concerns, personal well-being, social values, and miscellaneous. In total, there were seven aesthetic sub-themes, 17 naturalness and biodiversity sub-themes, 16 environmental quality and concerns sub-themes, 18 personal well-being sub-themes, 16 social values sub-themes, and five miscellaneous sub-themes (see Figure 4). After much examination of other models, these value themes were chosen because of their use in past urban forest research and because of the appropriateness of the themes for this research with the added benefit of allowing for more-comparable data across Canada.

As mentioned in Chapter 3, the sidewalk survey began with a rating scale to elicit urban forest importance responses. An overwhelming majority of respondents placed high value on urban forests by scoring them a '5' on the scale (79%). Fifteen percent of respondents gave '4' as their answer and 5% gave '3'. No respondents answered with a '2', '1' or '0' on the scale of importance. From 262 interviews, 654 value statements were listed. These values were assigned to the same six value themes and of the total values given, the top three represented values were environmental quality and concerns (27%), personal well-being (24%), and aesthetics (23%).

Figure 4. Urban Forest Value Themes

Urban Forest Value Themes					
Aesthetics	Naturalness and biodiversity	Environmental quality and concerns	Social values	Personal well-being	Miscellaneous
<i>Aesthetics (48)</i>	<i>Natural (95)</i>	Air quality (12)	<i>Recreation (65)</i>	<i>Shade (48)</i>	Privacy (5)
<i>Beauty (39)</i>	Diversity (24)	Buffer (12)	Alternative uses (31)	Urban forest connection (24)	Economic benefit (4)
Tree size (29)	Wildlife (24)	Ecological benefits (12)	Escape (26)	Exercise (21)	Food/fruit (4)
View (29)	Greenery/green (20)	Environmental benefits (10)	Community space (20)	Personal enjoyment (21)	Property value (3)
Urban forest colours (10)	Habitat (20)	Oxygen (6)	Urban forest experience (14)	Tree size (Personal well-being) (20)	Resources (3)
Pretty (3)	Green space (18)	Carbon (5)	General overall (benefits felt by everyone) (9)	Relaxation (19)	
Streetscape (3)	Harmony (17)	Cleans air (5)	Welcoming (6)	Health (13)	
	Urban forest atmosphere (15)	Shelter (4)	Adds character (4)	Peace (11)	
	Tree size (Naturalness/biodiversity) (13)	Overall health (3)	Safety (4)	Quality of life (11)	
	Nature (11)	Pollution control (3)	Enjoyment (3)	Calm (8)	
	Canopy (7)	Erosion control (2)	Social benefits (3)	Family ties (7)	
	Sounds (7)	Water filtration (2)	Canadian identity (2)	Stress release (3)	
	Non-native species (4)	Dutch Elm (1)	Intrinsic value (2)	Emotions (2)	
	Tree planting (3)	Renewal (1)	Appreciation (2)	Proximity (2)	
	Native species (2)		Noise buffer (1)	Quiet (2)	
	Elm trees (1)		Socialize (1)	Serenity (2)	
				Spiritual (2)	
				Happy (1)	

*79 Value codes with total number of mentions 967 ** ***Bold/Italic*** = Top five mentioned value codes

Aesthetic values included responses such as urban forest colours, pretty, beautiful, and streetscape, and in many cases and as illustrated by analysis of the data collected, participants cited ‘*aesthetics*’ or ‘*aesthetic benefits/values*’. Throughout the interviews all participants discussed the aesthetic qualities of the urban forest and referred to how the urban trees bring aesthetic benefits/values or beauty to the buildings and streetscape.

But there are also aesthetic benefits as well, the colours of the trees and buildings together...the trees bring beauty... (P21).

The second theme of naturalness and biodiversity encompassed elements such as habitat, natural, nature, green/greenery, diversity, wildlife, canopy, and the balance and harmony between nature and humans. When discussing and sorting through his pictures, participant P4 began to reflect critically on the importance of preserving natural spaces in the city and finding an appropriate balance.

A lot of human activities and development actually ruin the urban forest, so pictures with human influence are lower (P4).

Values from the themes of environmental quality and concerns were mentioned less than the remaining four themes. Environmental quality and concerns included general and specific ecological benefits such as air quality, buffers or shelter, temperature moderation, carbon storage, pollution control, and erosion control.

Personal well-being included values such as shade, health (mental, physical, emotional), relaxation, calming (sights, sounds, smells), and happiness, all contributing to personal quality of life. The urban forest provided participants with much-needed shade from the summer sun as well as a place to focus and reconnect.

I worked in a building on Ness and I had a tree that I could see out the second story window and it was just like... it focused me if I started to wander or

whatever... I find them a real focus: something to calm me and all the people working in these buildings. I think people who work in places like that really need things like that: they need green spaces. I think big buildings should have courtyards in the middle and stuff like that...(P1).

Social values conveyed fundamental social elements such as recreation, community space, an escape, alternative uses, safety, character, and contribution to the ‘*Canadian identity*’. The importance of alternative uses (e.g., art, fitness, and play) presented as a main theme throughout my interview with participant P20. He continually discussed alternative uses of the urban forest, or alternative reasons to have people visit the natural spaces. He believed that the alternative motives bringing people to the urban forest spaces ultimately increase their appreciation and urban forest values.

During the interview process, six participants discussed the importance of safety. The two main focuses of the discussions involved children’s safety and safety when cycling. Participants felt that urban forest ecosystems supply places in the city where children can play safely and are important to families and children, while also providing an oasis for inspiration, reflection, and relaxation. These places allowed children to play in a “*safe haven*” away from dangers (e.g., vehicle traffic) and provided shade from the heat of the summer sun. Participants also explained the benefits and values of having cycling trails and pathways through urban forest spaces, which offer a safer course for cyclists, along with a more enjoyable and an aesthetically pleasing route.

Miscellaneous codes, comprising the fewest value statements, involved economic benefits such as property value, firewood, privacy, resources, and food or fruit.

Some of the values put forth by participants varied in their requirements and definitions. The requirements of ‘*natural*’ spaces varied for participants as it is based

more on a feeling than on objective, rational inquiry and ‘beauty’ is a matter of individual taste (Moyer et al. 2008). Participants placed a higher importance on urban forest places that connected them to one or more of their key values. Many of the responses from participants encompassed numerous elements from the six themes as participants were able to link their key values such as naturalness, recreation, or aesthetics with other values generated.

Directly: Fresh air, shade and natural beauty, aesthetic- pleasurable to look at (P13).

Places to connect with nature, enjoy fresh air they provide, opportunity for city kids to see nature instead of just concrete, increase opportunities for teachers to take students into natural places, spaces to relax and enjoy calm (P13).



Plate 17. View of Assiniboine River

This was the one from on top of garbage hill. And I really just love, looking out over Winnipeg and every time I fly I love just seeing the trees and it just, you get the feel that the whole city is in a forest and it's the bigger picture of Assiniboine forest... I guess there is so much value in having that there. I wrote a lot of that on the sheets; you get habitat for animals, you get shade, recreation. And this is just sort of my picture of all of that. Bring it all into one (P7).



Plate 18. View from Garbage Hill

It's more than just a tree. It's the enjoyment you get from what the tree brings and the whole kind of atmosphere the tree creates in the backyard (P6).



Plate 19. Backyard tree

This picture shows one of the many benefits that we receive from trees, the shade the trees provide for people on the streets, in the parks, and in their homes or apartments, the trees provide cooling. But there are also aesthetic benefits as well, the colours of the trees and buildings together, the colours on the building. The trees bring beauty (P21).



Plate 20. Downtown apartment building

Of the top 12 value codes noted above, four fit within the aesthetics theme, three within both the naturalness and biodiversity and social values theme, and two within the personal well-being theme. The top value code mentioned was ‘natural’ with 95 references from 22 of 24 participants, followed by ‘recreation’ with 65 references from 20 of 24 participants, ‘aesthetics’ with 48 references from 16 of 24 participants, ‘shade’ with 48 references from 17 of 24 participants, and ‘beauty’ with 39 references from 12 of 24 participants. Below are photographs and quotes from participants describing their values.

...It looks like it's in the middle of the forest, so that just shows that you can be downtown and still be in a wild enough area (P22).



Plate 21. Value: Natural

This is Assiniboine forest, and I took that because of the path, you know you can go walking in the forest, you don't have to stick on the limestone path you can get off into nature, which is right now in the city and get lost there, if you are not careful (P4).



Plate 22. Value: Recreation

It's an apartment building built just a couple years ago and they actually trucked in some fairly mature trees when it was first built, I am not sure if it was aesthetics or just hoping it will grow up and cover up some noise from the street or whatever. I was trying to convey there was that its nice to see that they are actually planting trees, whether its aesthetics or what it may be, and this tree showing off on the upper right hand corner, is just across the street and its one of the more mature trees in the neighbourhood, I just thought that was visually pleasing... (P5).



Plate 23. Value: Aesthetics

I just like this place because you have the shade and you can just sit there and just relax, sometimes if you aren't feeling like sitting inside the classroom and studying you can just go outside and do it out there, so that's why I took these (P14).



Plate 24. Value: Shade

In picture four it is a view of the canopy, its absolutely beautiful, seeing the green trees, the blue sky, and the light shining through the branches and leaves (P2).



Plate 25. Value: Beauty

Values can be divided into two main interrelated categories (Rokeach 1973; Booth 1994; Ordóñez and Duinker 2010). These two categories form our value structure, which is composed of assigned and existence values, interrelated as the assigned values usually reflect a person's held values. The majority of the values given by participants fell into the first category of use values that have no market price and are characterized as non-consumptive use values (Konijnendijk et al. 2005). Values given by participants fell within each of the value categories including values such as beauty, pleasant landscape, clean air (air quality), recreation and exercise, shade, health, and environmental or ecological benefits such as carbon storage, water filtration, erosion control, etc.

Participants' top value code, based on frequency and number of participants who mentioned the value, was 'natural' and it referred to the trees, associated resources, and the countless natural elements of the urban forest. The natural values participants

attached to the urban forest included many elements that helped them connect and develop associations with the space. These ideas integrated responses such as “*untouched natural land*”, the mix of natural and recreational land in one place, “*raw nature*”, naturally functioning forest, or views of the urban forest landscape within the city limits that appear to resemble a natural space outside of the city. A notable example of depth related to naturalness and biodiversity was a reply that urban forests create “*...a natural setting in the city*”. This suggests the idea that natural areas can and should coexist with urbanization and an appropriate balance needs to be achieved. By examining residents’ top values, we can generate a focus when allocating resources for management.

What I do value from this is that it is kind of a varied landscape, like its flat and then its hills and so I like sort of the rugged aspect of it. And this was a whole bunch of branches in it, I guess it’s a tree that possibly came down at some point but its really big and kind of untouched and that’s one of the things that I thought was really beautiful about that, is, its really like nice to look at and the natural grasses and everything, the natural setting is just so beautiful, especially at this time of year, and then I took this because I liked how this is like, sort of your regular grass and this is the wild and I like how the contrast of the two and also I am just showing that they both can really enhance the environment (P20).



Plate 26. Top value: Natural

All participants felt that a connection to nature was valuable, and when asked, they all agreed that spending time in nature is important to them. This time spent in nature allowed for connections and personal bonds to be created which contributed to their care and concern for the quality of the trees. Twenty-three of 24 participants believed that nature is fragile, and that humans can have profound effects, that nature is not resilient, and we must take caution in our actions.

Within the comprehensive list of values elicited from participants, two questions from the participant journal were able to elicit 171 values from all 24 participants. These values related to the benefits provided by the trees and the forest ecosystems found in Winnipeg. Participants were asked yes or no questions, “do the trees in Winnipeg provide you and the city with any benefits?” and “do the forests in Winnipeg provide you and the city with any benefits?” (see Table 5). With a follow-up question asked to explain these benefits, in both cases all participants did believe that the trees and forests in Winnipeg provide both personal benefits and benefits to the city.

Table 5. Participant responses to the question: Do the trees and forests provide benefits?

Value Themes	Trees #	Trees %	Forests #	Forests %	Total #	Total %
Aesthetics (1)	12	13%	4	5%	16	9%
Naturalness and Biodiversity (2)	17	19%	18	22%	35	20%
Environmental quality and concerns (3)	26	29%	14	17%	40	23%
Miscellaneous Values (4)	4	4%	1	1%	5	3%
Personal Well-Being (5)	26	29%	28	35%	54	32%
Social Values (6)	5	6%	16	20%	21	12%
Total	90	100%	81	100%	171	100%

No Response ** 2 participants did not answer forest portion of question

Below are example responses from participant journals regarding the individual and citywide benefits of the trees and forests in Winnipeg.

Trees in Winnipeg:

Yes. Makes people happy, a connection with trees is important. Good/beneficial for the environment (P3).

Yes. We are able to experience wildlife first hand. We still have natural resources. It's a good breath of fresh air (P11).

Forests in Winnipeg:

Yes: Places of escape from lousy air, noise, man-made structures to nature, shade, lovely sounds, a feeling of relaxation (P1).

Places to visit (walk, jog, bike) 'to get away' and enjoy nature. A place for animals (deer, fox) to live without being too affected by humans (P5).

The top value code from the entire data set, (i.e., in both the participant journals and the follow-up interviews) was 'natural', which falls within the 'naturalness and biodiversity' theme (see Figure 4). When asked to explain benefits experienced from the trees and forests in Winnipeg, participant results indicate the top theme to be 'personal well-being'. The primary personal well-being values mentioned by participants were shade, exercise, personal enjoyment, and tree size. This could be explained because participants had the opportunity to experience the top-mentioned personal well-being values while on the site tours. Warm and even hot summer temperatures were made more pleasurable because of the large tree canopies and the shade they provided. Moreover, participants expressed their enjoyment of being outside in the urban forest, observing many residents using the spaces for exercise and recreational purposes.

When studying ecological consciousness of urban residents in two Canadian cities Peckham (2010) discovered two prominent value themes: the beauty of nature and urban

nature as a recreational escape for improved human health and well-being. The values generated from participants in my study focus on the aesthetics and the urban forest as a source of recreation, and natural ‘get aways’, which contribute to personal well-being and improved quality of life.

There is a great deal of commonality with the values elicited from the Winnipeg sidewalk survey, the forest site study tours, and from Peckham’s (2010) study. Values such as shade, air quality, aesthetics, beauty, recreation, and naturalness appeared many times within the results. When discussing natural spaces, participants placed higher value and preferred less-built, more-vegetative areas, where the urban elements were secondary to the trees.

5.1.2 Best captured urban forest values

Participants took between 13 and 27 photographs each during the tour and on their own time. After a discussion of the photographs, participants were asked if there was one photograph that best captures, or is the best representation of what they value about the urban forest, or what they hold most valuable about the urban forest.

Participants were to choose from all of the pictures taken. When compiled, the best-captured data builds upon and provides depth to the associations of Chapter 4 and the priority values discussed above in Chapter 5. The priority values natural, recreation, beauty, shade, and aesthetics put forth by participants earlier in the research are elaborated when discussing participants’ best-captured photographs. The recurring themes of finding a complete urban forest, or natural space within a city, presented themselves when discussing pictures from Assiniboine Forest and Wildwood Park. Many of the photographs selected to be the best representation of their values were chosen

because participants were able to find an abundance of their urban forest values in one photograph.

Photographs from Assiniboine Forest were chosen as images that best captured individual held values for eight of 23 responses. Best-captured reflections from Assiniboine Forest included ideas such as accessibility to the forest, that it represents a complete natural forest, and that it is a natural place in the city that people can visit.

Ok, because this is looking in to Assiniboine Forest. It is the most complete urban forest because even though we are on a walking trail, like I am standing on the walking trail, I am looking in to what looks like to me as a full forest. Right? It's complete ecologically speaking. My background is in botanical and ecological areas and so to me when I think about urban forest my immediate thing, when we were sitting there in the van, I asked you 'what is in an urban forest?' I hadn't even looked at the first question right. Because to me that is the perfect urban forest (P13).



Plate 27 & 28. Best captures: Assiniboine Forest (a) and (b)

That is a hard question because there is not necessarily one thing that I value. There is a lot of, I value a lot of different things, and I just, I love nature for all kinds of different reasons, and some of them are practical and some are artsy fartsy. And... I don't know I guess it would just be the one again in Assiniboine Forest, if I had to pick because to me that is the most raw nature. And the fact that we can go there and you don't need to leave the city, you don't need to hop in your car. You can be in a forest, it's cool (P7).



Plate 29. Best captures: Assiniboine Forest (c)

Four of 23 respondents chose photographs from Wildwood Park with reasons including the following: spaces comparable to Wildwood send a positive message; it combines nature, trees, and a neighbourhood all in one location; and demonstrates that people can live alongside nature without destroying it.

I choose this photo because it captures everything about the urban forest and everything I value about the urban forest, each individual aspect and all of them together; forest, trees, beauty, and colours. It's everything that I would like to see in a forest (P21).



Plate 30. Best captures: Wildwood Park (a)

Because it does show the it has people living there, areas that are set aside and designed whatever for people, play structure, that struck me the day we were there, there was a lot of kids using the play structure, running around the area, the noise of, the noise, the sound of kids playing, enjoying themselves, to me is quite relaxing and it shows that the forests or the wooded areas can be along with the population as well. To me that best describes the value of an urban forest (P5).



Plate 31. Best captures: Wildwood Park (b)

Five participants also considered their own yards, streets, and neighbourhoods to be what best captures their urban forest values because the images illustrate how they live and demonstrate the values they hold for the urban forest. Photographs of their own urban forests were able to illustrate many of the benefits received such as shade, shelter, greenery, privacy, recreation, spirituality, and beauty (see Figure 4.).

I took them at Kings Park and what I like about this place is that you have a lot of trees but you have a lot of people at the same time going there (P14).

...Yeah, ok. I would probably say, just looking back at the Vimy Ridge picture, I don't know where it is here, the Vimy Ridge picture where, the picture is looking up at the sky...This one. I would choose that one. Just looking at it now, I would choose that one, number 24. Probably because it reminds me of my mom and... and even the picture it just it really captures the sky and what's above (P16).

Because it is where I live and... it really affects my life because I am where I live all the time. And how they have these trees and so much green space, because I live right in front of the field, and they just have a field of grass so that's why it really affect me because it's all surrounding where I live (P10).

... just that to me urban forest like as I said before I like the fact that we have this range of uses, and range of types of forest in the city. But to me like... I think the important thing for urban forest, while its good to have a huge forest like Assiniboine Forest set aside, there needs to also be lots of bits of forest that are on people's way somewhere or close to where they live, that might just be a couple trees wide like this but on the edge of the river, but its there, it's a tiny ecosystem there are geese that nest there, and I have to ride by and scare them away. So that it's accessible, and its included into the city scape and not just sort of forest here instead of here (P9).



Plate 32. Best captures: Range of types and uses

One of the five participants described how she had the ability to tell stories about her family and the trees that surround them, that she had pride in her neighbourhood as she and her neighbours have the power to cut down the trees if they wished but instead they chose to sustain and keep them in good health.

Because it shows trees very close to homes... so it... to me it shows a bit of a story about, it prompts me to maybe tell a story about how they are related...And also, that people, that I want a tree close to me home, because we are all in the power to cut these down...You know, they can't fight back and there is no law against

it...So just to be that close to a house, obviously in this case for my neighbour they want it close to their house, and I've also allowed two trees to grow wild in my backyard because I want them there. For privacy, for shade, hanging clothes off of, you know a laundry line, all sorts of reasons. And yeah, I think it's a really powerful statement because it doesn't have to be there (P17).



Plate 33. Best captures: Own yard

The remaining responses discussed urban forest locations of all sizes in many locations of the city including yards, streets, parks, and other site tour locations. A primary recurring theme was the importance of having humans and nature living together, that in some areas such as Wildwood Park, a balance between urban and nature was established where the urban components are not the primary feature and the forest can thrive along with the urban elements. One participant took a different mindset when reflecting on his urban forest values and explained that what best captured his own values was that no matter where you are in Winnipeg, it is difficult to take a picture with no trees in it.

...But maybe this one captures it even better is 24, is that no matter where you are in Winnipeg if you try to take a picture with no trees its pretty difficult. Even with this thing where there is malls and I think the royal fork? And like, you know there is probably if you counted I bet you there is a dozen trees in this picture... And like I guess if you, if you really tried to do it you could, but it would be a challenge... Yeah like pretty much anywhere you are in Winnipeg you cant look, you cant look, you could not turn 360 degrees and not see trees, so that's what it is (P8).



Plate 34. Best captures: Trees are everywhere

5.1.3 Thinking about how others value the urban forest

After discussing and identifying their own key values, participants were then asked to reflect about how others value the trees in Winnipeg. When asked if they believed their key values and benefits were similar for all residents of Winnipeg, a combination of responses was given. Participants presented an assortment of responses dependent on the scale and location of the urban forest ecosystem visited. In many cases, participants had a positive outlook and were quite sure the benefits would be felt by all residents and reflected these beliefs through responses such as “yes”, “*I would hope so,*”

or “*I’d like to think so*”; these responses occurred when visiting sites such as Assiniboine Forest, Sherbrook Ave., and the private home on Wellington Crescent.

I think everyone enjoys driving or walking by such a green space (P1).

I think everyone would appreciate the beauty which is why Wellington Cres. is a bike route and is closed for walkers and cyclists on Sundays (P9).

When comparing Wildwood Park to other Winnipeg neighbourhoods, participants had a greater diversity of responses. Some believed that a treed playground such as the one in Wildwood Park would provide benefits for any family. Other participants struggled with what they believed to be resident neighbourhood living preferences, and an urban forest neighbourhood comparable to Wildwood would not benefit everyone as “*too many have the Waverley West style development*” preference for living.

Don’t know or yes, if people can have it both ways. Big house, big car and nature!?! (P15).

While some participants believed that residents desire living in urban forest neighbourhoods such as Wildwood, others believed that there are complex socio-economic issues looming and these feelings manifested in responses such as “*sadly no*”. A number of Winnipeg residents are faced with more pressing difficulties such as improper nutrition, housing, and income. These complexities are encountered daily and take first priority, thus driving the urban forest and its management further down the list of priorities.

No, too difficult to value anything beyond the basics if you are worried about where your next meal is coming from and too many Winnipegger’s fit this category (P1).

The level of appreciation varied among residents. The value we receive from anything is dependent on our connections and relationships with it, and a greater appreciation can equal a stronger connection. Throughout the interview, participant P5 continually talked about a personal appreciation of the trees and the forests, and how he believed as you age, you develop a greater respect for nature. The concept of appreciation emerged more in this interview than in any other.

Take areas for granted, most people don't know or appreciate how many trees we have, especially in the older parts of the city (P5).

A few of the participants felt that, unfortunately, not all residents are informed of the values and benefits of trees or rather some are “*ignorant to the values and benefits of trees*”, and certain residents “*do not consider our environment a serious issue or concern*”.

I think values and needs are different for people. But I do believe all of us have an inherent need to connect with nature (regardless or whether or not we are aware of it) (P20).

No participants felt that there were negative values or disbenefits associated with urban trees. Participant P2 did acknowledge that residents may not all have a positive outlook on the tasks to maintain their trees or the potential difficulties associated with trees.

The benefits are similar- shade, reducing cooling costs etc. Although not all residents have the same opinion, as many dislike raking leaves, nuts, fluff, etc. (P2).

One participant raised his concern relating to ownership and the ability for everyone to receive benefits. His concern expressed that while values and benefits are occurring, the public values are limited because the third site (the homeowner's yard) was private property.

I value the nature and the trees. What value it provides to me in this location is limited as its private property (P20).

While thinking about how others value the urban forest, the people who surround us in our daily lives and their beliefs and actions may play a role in shaping our values. During the follow-up interviews, participants were asked if they thought their family, friends, and neighbours valued the urban forest in Winnipeg, and to identify any signs that led them to feel one way or another. More than half of the participants - 14 of 23 - believed their family, friends, and neighbours valued the urban forest in Winnipeg (one participant did not provide a response). Signs, signals, and actions outlined in the responses described the continuous care and maintenance of the trees, and as participants described, "*they are keeping up their trees*" and "*they maintain, plant and covet their trees*". Many of these 14 participants also described how they surround themselves with like-minded people all with a mutual enjoyment of nature and partaking in outdoor activities. Two participants agreed that family, friends, and neighbours all valued the urban forest but could not describe proof or reasoning behind their responses. They felt it was something sensed by the way they live their lives, the choices they make, and through a mutual enjoyment of activities, not necessarily through talking, as this type of conversation does not often come up.

Five of 23 participants did not believe their family, friends, or neighbours valued the urban forest in Winnipeg. The explanations incorporated the impartial impressions received regarding the urban forest. Participants described thoughts that their friends or family did not have any desire to go or to be outside in nature, a local park, or green space. One participant mentioned that her friends and family never spoke about the trees and their importance, while another participant generated his response by the state of his neighbour's lawns, detecting that the trees and their care are low on their priority list, for whatever reason (e.g., ignorance or lack of knowledge).

Four of 23 responses were mixed. These participants were unsure if their family, friends, and neighbours valued the urban forest, or perhaps they believe their family does while their friends do not. One participant expressed concern for our lack of values towards the urban forest, describing the situation through his perspective: *"I think it all comes down to the same point. We all use it but we don't really notice it until we are pointed to it"*. During the interview, participant P5 discovered his response after a reflection of the pictures he took on his own time.

Well this research has kind of answered this for me, my neighbour that I took a picture of his backyard with all the trees and stuff, he is definitely a good one and is compelled, he isn't a fanatic about it but he had brought in the tree service, so he is actually spending some of his own money trying to maintain the forest, on the other hand if you look a couple houses down, people chop down the trees, I don't know why, maybe because they are blocking the view, maybe they don't value the forest or what, I don't know (P5).



Plate 35. My neighbour's trees

Participant P23 struggled and was disappointed with the differences between generations and how age can play a critical role with our lifestyle choices.

I don't know, its very disappointing sometimes I think that people wouldn't have the same values as we would, but I think my parents would, the older generation I think would (P13).

For some residents, nature and the trees are not on their personal radar. This may be because of their socio-economic status or because of a lack of knowledge on the diversity of roles, advantages, and benefits of the urban forest.

5.2 Factors affecting our value associations to trees

Our associations with the urban forest are complex and have the ability to influence our values. For some people, these associations are modified as the situation differs. The main factors affecting resident values that arose from the data included the scale of the urban forest, tree size, seasonal changes, and urban forest ownership. Each of these factors and their impacts will be discussed below.

5.2.1 Urban forest scales

The urban forest in Winnipeg consists of private and public spaces of all sizes. An objective of this research was to understand how citizens' values differ in relation to the various scales of urban forest ecosystems. When examining participant definitions of the urban forest, they did not use small-scale, single trees, or even tree-lined streets, but rather their definitions were kept to larger established treed areas such as parks and forests.

To help understand how values differ in relation to scale, I asked participants, after completing the site tour, to rate this statement for each site: "Site #1 is very important and captured all of my values". Ratings were done using a five-point rating scale, with '1' being strongly disagree and '5' being strong agree. Assiniboine Forest and Wildwood Park had the top number of '5' scores (Table 6). Site four (Sherbrook Ave.), the tree-lined street, and site five (University of Winnipeg) were rated with the most '2' scores, telling us that, in general, participants disagreed with the statement that 'this site is very important and captured all of my values'. Only a small number of participants used 'strongly disagree' when rating the sites, meaning participants believed there was some importance and value to the trees at each site.

After rating the sites, a follow-up question asked participants to explain their choice of most important and least important sites visited. Participants' most important sites were Assiniboine Forest with 14 of 26 most important votes, Wildwood Park with five of 26, and Garbage Hill with four of 26. The least important sites were the private homeowner's yard with six of 21 votes, the University of Winnipeg with six of 21, and Sherbrook Ave. with five of 21 votes. Responses from participants explaining their

thoughts in relation to the level of site importance for the top-rated sites (Assiniboine Forest, Wildwood Park, and Garbage Hill) included the natural elements these locations provide in a city setting, and that Wildwood Park represents an alternative living model that provides a balance or harmony between humans and nature.

My favourite site was the Assiniboine Forest because it is a more natural representation on the landscape. I think it's the most important because we live in such an artificial world it's good and refreshing to see un-adulterated nature (P18).

I think site #2 is the most important because it shows that we don't have to build traditional neighbourhoods as concrete jungles. A beautiful and highly functional neighbourhood can be built and maintained through maintaining the forest landscape (P20).

Gives a good perspective of the amount of trees we have in Winnipeg (P13).

Responses towards the least important sites reflected the feelings that the trees are not the primary focus and that the urban influence takes over the natural space.

All have importance in their own way but site 5's space had too much hard-space/concrete/paving where it could have more plantings/tranquility instead (P22).

Sherbrook (#4) because it was obvious only a small effort was taken to "green" the street. Also, I think any effort was developed for an economical standpoint irrespective of environmental concern or conservation. It shows that attitudes regarding trees, green space, ecology still have a long way to go, I think if the attitudes in the development of site 4 would have been directed at environmental responsibility they would have done a better job (P23).

Certain participants were not able to pick specific sites but did reflect that they found deeper value in the more natural and most hinterland-like setting provided by Assiniboine Forest.

Hard to say. They all have value in their own right but I don't consider them as valuable as site #1 (P7).

Table 6: Urban forest importance

Ranking results	Strongly agree				Strongly disagree	
	'5'	'4'	'3'	'2'	'1'	Total
Site #1	15	6	0	0	2	23
Site #2	10	10	2	0	1	23
Site #3	3	10	8	1	0	22
Site #4	5	4	4	8	1	22
Site #5	6	7	1	7	1	22
Site #6	5	8	6	2	1	22

These results correspond and complement the findings discussed above that participants have strong connections and associations with the urban forest and assign value to all of the trees in Winnipeg. While participants value all urban forest ecosystems, scale does affect those values. The sites with more green space, trees, and less human interference, such as Assiniboine Forest and Wildwood Park, encompassed participants' values more than sites such as the private homeowner's yard or Sherbrook Ave. where participants felt the trees were not the primary focus.

5.2.2 The impacts of season and size of trees on value associations

Participants were asked if their own values change as the seasons change. On the site tour, participants were able to experience the urban forest in the summer season but not during spring, fall or winter. When interviewed, participants were asked if they believed their own values towards the urban forest changed as the seasons changed. Thirteen of 24 participants did believe their values changed. Some believed their values decreased and they valued the trees less in the winter. However, other participants believed they maintained the strength and array of their values throughout all seasons but

acknowledged that shifts did occur in their perspectives and in what they valued.

Participant responses included *“Yes...but I still see value”*, *“I value them less in the winter”*, *“...forget about them in the winter...”*, *“They play a different role in making the world around me look nice”*, *“ I can see value in every season, because I use them for every season”*, *“ ...Not as useful during the winter, I see different things about trees in different seasons”*, *“It’s not that one is better or more valuable but my perspectives change”*.

Ten of 24 participants did not believe their values towards the urban forest changed as the seasons changed. For some, the seasonal changes were not the main factor supporting their values; instead, their values are driven by accessibility to the urban forest site, no matter what the season. Other participants believed they received value from each season: *“I see value with every season...I appreciate it differently at different times”*, *“I don’t think that my values are increased or decreased”*. One participant was unsure if her values changed, but did recognize the personal desire to experience the urban forest ecosystems: *“I am not sure if they change. I think I would say, personally that my need to be outside, probably it feels heightened in the winter time... if I don’t get outside I really feel it where as I am not necessarily as anxious about that in the rest of the seasons”*.

As the seasons change, various participants viewed the urban forest through a different lens and developed different values for the trees. The level of importance of the urban forest remained the same, but what they found important or what they really valued about the trees/forest could change. Participant P24 expressed this modification in her

association with the trees when she is discussing her experience at Sherbrook Ave., the tree-lined street site on the tour.

These are traffic arteries that I frequent on my daily travels. The fact that they are tree-lined is a gift that I tend to appreciate most at the change of season—spring and fall (P24).



Plate 36. Seasonal changes of the urban forest

Participants were also asked if their values differed with tree size. In Winnipeg, the urban forest is composed of tree species of all ages. Some neighbourhoods are home to mature elm trees with far-reaching canopies, while many of the new developments have only immature trees. When asked if their own values changed with tree size, participants seemed to place higher value on older, larger trees but did still hold value with the trees of all sizes.

I enjoy older trees more but size is only one aspect or one characteristic of a tree or forest. It is not the only consideration when I think about my values towards trees (P2).

Participants discussed the impacts that come with the larger trees such as shade, freshness, the bright environment, and ecological and economic benefits for the

surrounding buildings such as not needing to run air conditioning units as much.

McPherson et al. (1997) explains that large healthy trees are able to remove 60 to 70 times more pollutants than small trees. While visiting urban forest sites, participants experienced this and commented on how fresh the air seemed compared to the more urban areas a short distance away.

Personal well-being was linked with tree size as the larger trees provided more shade from the canopies. Families and children are able to take refuge under the canopies from the extreme heat brought on by summer months. The site visit to Wildwood Park was a prime example of the ability the trees have in guarding against the sun and regulating the microclimate to a comfortable temperature. A few participants reflected on their own life choices guided by the trees.

...I picked where I live because of the trees, like I have never lived in an areas where there were not big trees so, I guess, I don't like new areas for that reason...I know they try, and they are trying but it takes 20-30 years to come up with, even longer maybe 100 years come up, some of the elms and stuff, the stand (P4).



Plate 37. Impacts of tree size

And then this is just such a big tree that it needed a picture because big trees are satisfying, and it has nice shade and you don't often, one of the nice things about this sort of tree in the middle of a park is that they have space to spread out and they you know, they grow in different a shape than they do in a forest. And so you can kind of appreciate that in a different way in that setting...because they are always growing up right they are not growing out, so they spread out more when they are in a situation like this. And then you've got that one big tree in the middle of grass, and you're like wow that's awesome! So yeah, so that's I think partly why all of these had to be in the high because they are all good in different ways (P9).



Plate 38. Impacts of large trees

5.2.3 The impacts of tree ownership on value associations

During the follow-up interviews, participants were asked questions directly relating to forest ownership and if differences in ownership affect how they saw and valued the urban forest. In this case, the types of ownerships included public and private. On the site tour, we visited both public and private places. Assiniboine Forest, Wildwood Park, and Sherbrook Ave. are all public spaces, while the homeowner's yard and the University of Winnipeg were private places. The final stop at Garbage Hill itself is a public space,

but the view of the trees included both publicly and privately owned trees. Participants gave mixed responses with nine of 24 believing their values differed with different ownerships, nine of 24 believing they did not differ, leaving six of 24 seeing value and importance in both, or believing no one owns the trees.

Six participants placed the same degree of value and importance on both public and private trees, or they did not believe that someone could actually own the trees. Instead of owning the trees, a particular person or business has the responsibility of maintaining the health of the trees. Responses contained phrasing such as “*I guess I see the trees but I don’t realize who owns them*”, “*both are important*”, “*equally important*” “*no one owns the trees*”. Participant P21, along with other participants, looked beyond urban forest ownership:

I don’t see who owns them when I look at them. I just see the trees and their beauty (P21).

Nine participants did not believe their values towards the urban forest differed according to ownership. It did not matter who owned the trees, and in many cases participants believed it to be difficult to identify who the owners are. Instead, the importance is based on having trees and someone to provide upkeep and attention.

Not really actually I don’t think so. Because I think well when we looked out here and those trees that are behind this building you wouldn’t know from here whether they are boulevard trees or if they are trees in someone’s yard and... I don’t know really... like the nice thing about trees is that you don’t have to do a lot with them, its not like a cat, right? You don’t have to feed the tree and I think people just kind of look at them... the same whether they are...private or public (P8).

There trees. There trees (P9).

Nine participants stated that their values differed with ownership. For some it was because of accessibility concerns, while others felt they had more control over issues if the trees or forests were publicly owned, or the trees had better care and management depending on their owner.

Well yeah, definitely because like if its yours, you will take care of it really well and if its public you will be concerned less so like people who have a backyard and planted trees, the person we went, the professors house, right? ...He had like 7 or 8 kinds of trees in the backyard. Well in public, city public place, you will see only one kind or two kinds of trees. So this is how people are taking care of them, the interest how many they want to plant... you know? (P12).

Participant P24 experienced transformations in her own behaviour and thoughts while partaking in the site tour: *“my awareness is heightened now about appreciating that other people are contributing just simply with their own front yards and backyards”*.

When reflecting on the third site, the private homeowner’s yard, participant P1 did not deem the site to be an urban forest because urban forests are not private. When asked if her values changed in relation to ownership, P1 did believe her values were altered as she valued the public trees more because they are more *“accessible to greater numbers”*.

Because urban forests usually aren’t private in my definition. My backyard is heavily treed but I still don’t consider it an urban forest (P1).

One participant raised the concern of ownership and the ability to receive benefits. Although values and benefits are occurring, the public values are limited because the third site, the homeowner’s yard, was private property.

I value the nature and the trees. What value it provides to me in this location is limited as its private property (P20).

Participants also felt that public or private ownership played a role in the maintenance and management of the urban forest. To begin the discussion, participant P5 reflected upon and articulated what he believed to be the varying level of priority lists connected to private and public entities.

I guess there are a couple of ways to answer that, one answer is, no I don't think it really matters. But deeper than that I guess it does seem to matter in the results. Private ownership may take better care than the city and the public institutions may take care of their trees but its sort of priority wise. Where as a person in there yard has 3 or 4 trees and one is dead or needs pruning or whatever, they do it. City own environment there are certain priorities, you know you go down Sherbrook avenue and you can't say they are not looking after but its just, it doesn't look like its being taken care of that much. Just the impression you get, when you see all the dead trees and empty spots, it doesn't mean they aren't looking after them but it just doesn't look like they are and I can understand the priorities, there are hundreds of thousands of trees versus the 3 or 4 in my yard. I don't think its less valuable I just think it's different... (P5).

After asking participants if the difference in ownership affected how they valued the urban forest, participants were asked to consider management. They were asked whether a difference in ownership affected how the urban forest is or should be managed, and if ownership carried positive or negative management impacts.

Participant responses varied greatly. Four participants were adamant that private ownership had a positive impact on management and four others were strongly behind public ownership for better management, while the remaining 16 participants gave pros and cons for both types of ownership. The 16 undecided believed management to be context-specific and dependent on numerous factors such as choice of property usage, available funding/resources, level of standards, preferences, priorities, visions, and value

sets. One participant made it clear that Winnipeg's elm tree population should be protected and given special attention regardless whether the trees are public or privately owned. Participant P7 acknowledged that while it is difficult to dictate to people what they should do on their own land, the private landowners play an important role in managing the urban forest.

...Without private owners keeping their trees on their lot it would take a lot away from the whole bigger picture. So there is an important partnership there (P7).

Participant issues with private ownership relate mainly to owners having their own prerogative and ability to choose what to do on their respective properties, with little say from other individuals. In some cases, with private ownership there may be many conflicting uses as individuals have different ideas and visions for the property.

If a private owner has a passion for the natural world, perhaps the trees may be in better condition, than when someone takes care of trees because it is in their job description. Public priorities may not reflect the type of management needed for the urban forest. Some participants believed the publicly owned trees to be worse off because of other priorities such as roads and potholes. In certain cities this may be the case, but the public ownership is held to a level of sensibility and ultimately answers to the public.

5.3 Development of values and learning processes

Values and attitudes are important tools within our education and learning processes because when we face decisions, our values are the motives or driving forces behind our choice of behaviours. Education and knowledge can act as important variables providing linkages between a person's values, attitudes, and ultimately

behaviour (Sinclair 2007; Richardson 2008). The transformative learning processes occur when knowledge and education are acquired leading to personal growth and a change in our behaviour toward the environment (Richardson 2008; D'Amato and Krasny 2011).

Participants cited many sources from which they obtained knowledge and information about the urban forest such as municipal and provincial government websites, local 311 help lines, the Manitoba Forestry Association, the Arborist Society, Forte Whyte Centre, friends, family members, and community groups. Participant P13 illustrates the importance of continuous adult learning, which has the ability to address issues such as sustainable resource use.

...I will never pass up an opportunity to learn, and not just learning from other people but learning from the experience itself. I think it was wonderful, I really enjoyed it; I thought it definitely changed my perspective on from a very narrow to a much broader now (P13).

5.3.1 Development of values

To address the final objective of determining how residents have learned about the urban forest, and their held values towards it, participants were asked in the interview to try to explain how they came to hold the values they do about the trees and/or the urban forest. Moyer (2006) discusses how the influences of family and experiencing nature through a wide range of activities at an early age developed people's appreciation for nature and allowed them to make connections with the natural world. Family and contact with nature played a primary role in influencing the early formation of values. The findings of this study follow along with Moyer (2006): 18 of 24 participants mentioned their appreciation and values beginning at an early age, while 19 of 24 discussed how

family members influenced them while young. In many cases, one family member such as a mother, father, aunt, or grandfather played an influential role and was the motivation behind furthering their education in biology, ecology, botany, or general sciences. These interests sparked a passion for nature that some participants held through their adult life. Participants described how their parents had a “*certain reverence for nature*” allowing for the parenting models to generate early appreciations for nature.

I would say through 3 different ways. The first just throughout my life, through my upbringing, I have memories about planting trees and learning about acid rain in school as a young kid, this started the awareness of trees and nature in general. I did have the opportunity to travel growing up, less as I got older but I remember learning about bugs and how to deal with them. And now being a homeowner I have tried to do better, doing things like using reclaimed wood to heat my house, wood that would have been wasted. The second would be my exposure to information, throughout my life in one way or another I have been exposed to information regarding trees and the natural world. The third would be that I have a general interest in biology and ecology, this may be because of my upbringing-why I am interested as an adult (P15).

So I think there is also an individual value base there. Isn't not just borrowed from my parents, but I've continued as an adult to carry those values. And not just because my parents value them, but they seem to be central to who I am (P17).

Five of 24 participants discussed an opposite idea: the lack of trees they experienced while growing up influenced their appreciation and values towards the urban forest. The absence of trees cultivated a great value held towards trees: “*growing up on the prairies you appreciate your trees, maybe more than people who are used to having them everywhere all the time*”. Two participants who were not originally from Winnipeg reflected on how the environment in which they grew up initiated their appreciation for trees. Participant P14 explained how he believed his hometown was ‘diseased’ because of the large amounts of smoke and the little shade, which are two of the reasons he chose to move away and settle in Winnipeg.

5.4 Urban forest learning processes

One of the first steps essential to transformative learning is the process of critical thinking and reflection, which for some participants began and occurred throughout the site tour.

Forest is “encroaching” urban development or development is encroaching the forest? (P15).

...When the first question on the questionnaire was ‘what do you consider as an urban forest’ and I said somewhere with mature trees, and then half way through I was like ‘oh crap’ I changed my mind kind of but... that was my initial...(P22).

While taking part in the study, participants expressed that their own perceptions of an urban forest were altered after coming on the site tour. During the interview process, participants communicated comments reflecting how they became more observant of all trees and they now notice trees along streets or on property that they did not pay attention to before. Participants expressed the idea that they have developed a greater appreciation for single trees, tree-lined streets, or larger urban forest areas.

For other participants, their own idea or definition of the urban forest changed since participating in the research study, specifically in association with the urban forest site tour. These changes can be seen through internal deliberating of P24, P13, and P16 throughout the morning site tour.

Site Three: Do you consider as an urban forest?

Not really, in my “usual” definition although it is a place that values and protects and nurtures trees and contributes similar benefits to the environment on a smaller scale (P24).

Can you describe what you would consider as an urban forest?

I have expanded my concept of an urban forest over the course of this morning. My initial concept would have been most aptly illustrated by a place like Assiniboine Forest, but now includes a wider range of treed areas (P24).

To be honest, my idea of an urban forest, before we even did this type of project was definitely more towards just the absolute natural type of environment. And that you know, a lot of the stuff we looked at, you know around the u of w, on Maryland or...Sherbrook, yeah. Were not my ideas of urban forest, I mean there are trees and things like that but my perception changed a little bit along the course of the trip, and kind of appreciate them in different ways, that this could be considered an urban forest (P13).

I could just sit there, you know, once, every now and then, and go there every now and then, and just take it all in, a way to get higher than everything else and... I didn't consider it to be a general forest, mostly because there weren't that many trees there and I think that's what I've learnt through this project, is that I think their needs to be, for me there needs to be trees, a lot of trees for it to be a forest...(P16).

Many participants were in the same situation as P24, P13, and P16 in that they had to really reflect on their own definition of an urban forest. Participant P23 mentioned how partaking in the research had an immediate impact on her own beliefs, causing her to re-examine her own values “*you almost change your mind as your writing... it got me thinking...*”. Participant P24 experienced changes in her own behaviour and thoughts because of the inquiries regarding the different types of ownership and their impact on management, which was something she had not previously reflected upon: “*my awareness is heightened now about appreciating that other people are contributing just simply with their own front yards and backyards*”.

While partaking on the site tour, knowledge acquisition and learning occurred among participants throughout informal discussions or conversations while traveling between sites in the van, and while having the picnic lunch.

I can identify plants, I was really enjoying the experience, like a guy would ask what kind of tree is the, and I was like this is an elm or a green ash, I would tell genesis and species name, and it was like oh this is amazing, and he was asking me why trees grow a certain way, I was talking about that, I had a chance to teach people during your particular tour, I really enjoy it! (P13).

5.4.1 Instrumental and communicative learning

Instrumental and communicative learning are the two main domains of transformative learning. Instrumental learning requires the learner to develop competence in coping with the external world through a technical understanding and includes task-oriented problem-solving (Mezirow 1995; Diduck 1999). Communicative learning involves social interactions such as interpreting, constructing and negotiating meanings through the communication of intentions, values, opinions and normative concepts (Mezirow 1995; Diduck 1999).

Communicative learning examples put forth by participants incorporate developing an understanding of urban forest management issues. Examples included things like informal observation learning at community events such as Envirothon, folklore and legends passed on about the Wolseley elm in Winnipeg, and critical reflection on matter such as whether neighbourhoods such as Wildwood Park are actually a sustainable choice. Other management issues put forward include fire bans and management, and attempting to understand why we are planting non-native or alien species when they do not thrive as well as native species. Participants also reflected on management difficulties associated with urban deforestation, the loss of trees, and urban development. Reflections referred to whether cities have the ability to achieve a balance between urbanization and the number of trees in a city, whether there is a minimum or maximum number of trees that we can cut down to accommodate development, and

where does the responsibility fall for maintaining an urban forest - is it a community affair or civic responsibility?

I have made an effort to take care of the trees and to learn about them because they don't come with manuals and in some cases tree care can be difficult for someone who doesn't have knowledge about trees (P15).

Examples of instrumental learning put forth by participants include a wide range of urban forest management activities on both individual and community levels, such as learning the different types of trees in the neighbourhood. Other individual examples include planting, gardening, use of pesticides and alternatives, acidification of soil, species identification, invasive species, lifespans, pruning and pruning courses, and firewood care: *“had city inspectors going through my firewood...learned about wood care and Dutch elm disease”*.

Participants put forth what they believed as examples related to proper care and management of tree roots and canopies, because if not maintained they can cause issues to hydro lines, sewer lines, and home foundations. A large focus of instrumental learning yields attention to the concerns of Dutch elm disease, with preventative actions such as tree banding, proper procedure for the removal of diseased trees, and pest management. Participants partaking in instrumental learning at the individual and community levels included activities such as community clean-ups, disease and pest management, and Dutch elm action and awareness campaigns.

The results indicate that participants have engaged in both instrumental and communicative learning. In the majority of circumstances, personal development of values began with the individual at a young age and has been occurring over time, continually reassessed through critical reflection as opportunities for new knowledge

emerge. In many cases, participants' connections with the urban forest were based on instrumental learning outcomes. With the acquisition of knowledge, participants want to act to protect the trees and urban forest with which they have positive associations. An article in the local newspaper demonstrates the positive impacts public participation can have on the management of local urban forest ecosystems. Residents of the Wildwood Park neighbourhood had come together in the past to form the Wildwood Heritage and Conservation Committee, to ensure that the community's trees remain for future generations to enjoy. Now the committee has surveyed the community's residents and identified naturalization priorities (Winnipeg Free Press 2012).

5.5 Summary

Judging by the abundance of values given by participants and their own beliefs that their families, friends, and neighbours also value the urban forest, the participants do indeed hold deep values in relation to the urban forest, particularly for the themes of aesthetics, naturalness and biodiversity, and social values. The two most mentioned value codes of the top 12 codes were 'natural' and 'recreation', with 22 of 24 and 16 of 24 participant references.

Within this research, participants' values linked the urban forest with a natural environment in the city setting. Imperative to this natural environment was the importance of finding a level of balance or harmony between development and nature, which was a priority for many participants who recognized the necessity of having trees in urban centres. Participants also linked the value of the natural environment to many of their other urban forest values. The natural environment provided a place for exercise, recreation, alternative uses, relaxation, escape, a source of spirituality and beauty, among

others, all of which improved their mental, physical, and psychological health contributing to an increase in their overall quality of life. These results of an increased quality of life are consistent with urban forest literature e.g., Dywer (1982), McPherson et al. (1997), Miller (1997), and Ordóñez and Duinker (2010). The study results regarding the desire for a naturalized space are consistent with Peckham (2010) and Konijnendijk (2008) that urban residents seek natural spaces for numerous reasons such as calming, peacefulness, and the possibility of an opportunity to ‘get away’ or ‘escape’.

For many participants, the learning and resulting development and modification of urban forest values has been life-long and continues to be critically reflected upon. Participants were able to describe both instrumental and communicative learning processes or outcomes that occurred as a part of their life-long experience and through their participation in the research itself. This learning relates to urban forest management practices such as pesticide use, tree pruning, type of trees most practical for our climate, and conservation of urban forest ecosystems. Experiential learning occurred for many participants through partaking in this research. As Aristotle described, “for the things we have to learn before we can do them, we learn by doing them” (Hummel 1999). Participants were able to reflect critically on their own ideas and values and learn from experiencing the urban forest ecosystems and from other participants.

Chapter 6 Conclusions and Recommendations

6.0 Overview

Urban trees are subject to limitations and stresses that hinterland trees are not (e.g., lack of growing space, contaminated soils, salt, harsh climates, trenching, lawn mowers, and cars) (Canadian Urban Forest Network 2006). While the difficulties faced and the benefits provided by the urban trees have been fairly well documented, there was opportunity to develop an understanding of residents' connections with and values related to their urban forest.

As such, this research focused on developing an understanding of urban forest values and the relationships between the values residents of Winnipeg hold and the urban forest ecosystem around them. The specific research objectives were: developing an understanding of what Winnipeg residents consider as an urban forest ecosystem; understanding how citizens' values differ in relation to the various scales of urban forest ecosystems; exploring how urban forest values may differ in relation to different types of forest ownership; and determining how Winnipeg residents have learned about the urban forest, thereby informing the values they currently hold.

This chapter provides conclusions in relation to these objectives and recommendations based on the results of the data analysis and establishes opportunities for future research.

6.1 What is an urban forest?

The aim of the first objective was to understand how residents define and what they consider the urban forest to be. The first question asked of participants was to define and give example of what they believed to be an urban forest. As the results sections of the thesis show, Assiniboine Forest was given as an example by 10 of 15

responses. When asked if participants considered Assiniboine Forest to be an urban forest, 23 of 24 short-answer responses were certain it was, and when visiting sites on the tour, 22 of 24 responses considered the site to be an urban forest. Subsequently, when conveying what best represents participants' urban forest values, Assiniboine Forest, and similar sites, were given in eight responses. The combination of these results helps in articulating participants' view of the different types, scales, and definitions of the urban forest. Residents consider places like Assiniboine Forest (as described in Chapter 3) as an urban forest, to which many ascribe high value and importance.

While the results convey the ideal of an urban forest as a landscape that contains an abundance of trees and is at least somewhat natural, they also included many other elements of an urban forest ecosystem in their definitions. Within their urban forest definitions, participants incorporated ecological and social aspects of the forest, including the biodiversity and cultural components. For example, definitions referred to “*an indigenous large group of trees and the associated ecosystem*”, “*an area with biodiversity; trees; different animals, insects and plant species*”, and “*a natural area left undeveloped*”. More broadly, the participants definitions corresponded with the literature that presents the urban forest as the natural and planted trees and all of their associated resources found within urban areas, including street trees, residential trees, park trees, and greenbelt vegetation, including trees on unused public and private land (Miller 1997; Nowak et al. 2001; Ordóñez and Duinker 2010).

Participant definitions and considerations of the urban forest also made note of the need to find an appropriate balance between urbanization and nature. Further, they thought that an urban forest was considered a grouping, bunch, or line of trees and not a

single tree. Participants also deemed some spaces not to be an urban forest, despite the presence of trees, because they felt there was too much human interference. The results indicate that this interference rendered the spaces unnatural due to the presence of elements such as vehicles (traffic), concrete, roads, buildings, and businesses.

6.2 Urban forest values

Through the field techniques used participants were able to reflect on their own held values as they relate to the urban forest. Through participant journals, site tours, photo-elicitation, and interview discussions, hundreds of value statements were generated from participants, the majority falling into the category of use values, which have no market price, and are characterized as non-consumption values (Konijnendijk et al. 2005). This is consistent with the idea that urban forests are primarily providing services rather than goods (Clark et al. 1997). Further, the large number of use values put forth by participants is consistent with hinterland forest and urban forest literature (Natural Resources Canada 2012).

The results indicate that participants have deeply held urban forest values particularly in relation to aesthetics, naturalness and biodiversity, and social dimensions. The top five values elicited from participants were naturalness, recreation, aesthetics, shade, and beauty. On numerous occasions in the research participants reinforced the importance of nature and having a natural space part of their daily lives. Definitions of 'nature' are complex, however, as the concept is a social construct and varies over time and from person to person (Thomashow 1995). The different ideas of nature integrated ideas such as "*untouched natural land*", the mix of natural and recreational land in one place, "*raw nature*", naturally functioning forests, or forests within the city limits that

appear to resemble a natural space outside of the city. Participants indicated that spending time in nature allowed for a connection or personal bond to be formed with their natural surroundings. In many cases, the time spent in nature was attributed to recreational activities, which were linked to positive health impacts and personal well-being.

The results also indicate that participants have strong connections and associations with the urban forest and place value on all of the trees in Winnipeg. While participants recognized value in all the urban forest landscapes, scale did impact their value preferences. The sites with more green space and trees, and less human interference, such as Assiniboine Forest and Wildwood Park, corresponded most closely with participants' values than sites such as a private homeowner's yard or a treed downtown streetscape, where some participants felt the trees were not the primary focus.

Clark et al. (1997) indicate that an important characteristic of the urban forest is that the majority of the trees are growing on private lands (Clark et al. 1997). On the site tour, we tried to consider this by visiting sites that were both public and private spaces. Assiniboine Forest, Wildwood Park, and Sherbrook Ave. were all public spaces, while the homeowner's yard and the University of Winnipeg were private places. The final stop at Garbage Hill itself is a public space, but the view of the trees included both publicly and privately owned trees. The results show that many participants had the ability to look beyond ownership, or saw the importance of both private and public forest to the cities "urban forest", while others believed their values changed based on ownership. Reasons for the value shifts included the successes and failures associated with private and public ownership. A key success was that many private owners have a

passion to keep the trees in the best condition. But private failures included that the owner has their own prerogative, and may choose to cut down all the trees. Private owners may have conflicting visions for the properties, one owner may be looking for sunlight to grow a vegetable garden while another is looking to shade and cool their building from the summer sun. The lack of priorities and monetary resources were the main public failures identified, while public successes reflected that public ownership is held to a certain standard and level of competence, ultimately answering to the public. Participants' reflections on ownership suggest that to be sustainable, the urban forest requires some form of human intervention and cannot be completely separated from human activities.

6.3 Developing urban forest values and understanding

Similar to Moyer's (2006) findings, participants spoke about the two primary influences regarding the development of their urban forest values. Their family, (specifically parents) and having outdoor experiences underpinned an appreciation for nature and the urban forest at a young age. Some indicated that this early appreciation created a passion for nature, allowing for critical reflection and thinking about nature and the forest throughout their adult life. This early learning and thinking helped and challenged participants as they attempted to develop their own urban forest values and understanding.

The learning outcomes reported in chapter 5 suggest that participants have engaged in both instrumental and communicative learning. In many cases, the connections with the urban forest for participants were based on their instrumental learning. For some, once they had acquired some knowledge of local trees and their

benefits they wanted to act to protect the trees and urban forest with which they have positive associations. This desire for action and protection in part underscore the passion with which people fight against the spread of Dutch elm disease in Winnipeg, and why so many individuals, neighbourhoods, and community groups are engaged in prevention activities such as tree banding.

6.4 Recommendations

The findings of this research point to a number of recommendations based on values participants hold in relation to the urban forest in Winnipeg.

1) Increase the dialogue among residents, academics, and professionals to encourage improvements to the quality and sustainable management of the urban forest in Winnipeg.

Participants were asked to rate the condition of the urban forest in Winnipeg, either ‘poor’, ‘o.k.’, ‘good’, or ‘excellent’. Eleven of 24 and 10 of 24 participants scored the urban forest as ‘o.k.’ and as ‘good’, indicating a considerable amount of room for improvement. Clark et al. (1997) maintain that achieving sustainable urban forests does not arise randomly, but is founded on community cooperation, shared visions, quality care, continued funding, and personal involvement. According to Peckham (2010), future sustainable development in Canadian cities depends strongly upon incorporating the values and perceptions citizens hold about urban nature, and indeed nature in general into planning processes. Over the years, environmental conversations regarding issues such as sustainability and climate change have increased within mainstream business practices, politics, and general conversations. The impact of climate change on urban forests needs to be brought to public attention so it becomes a mainstream topic for

discussion. When discussing the values held by family, friends, and neighbours, participants brought to light the fact that urban forest values and management conversations are not regularly occurring. This is something that needs to be addressed, and become a mainstream topic in all households, private businesses, and public institutions.

One method for creating an increase in dialogue can occur through the steps involved with the creation and implementation of an urban forest management plan. The public can be involved in many steps such as establishing the values they attribute to the trees in order to identify key ideas, through the prioritization of the management goals, and to help with the continued monitoring for the successful implementation of the plan.

By increasing dialogue on sustainable management of the urban forest, we can take a deeper look into the condition of the urban forest and what residents believe need to be improved. This dialogue must include all individuals involved as the trees have both public and private owners, who are tasked with maintaining the urban forest ecosystems in Winnipeg. An important partnership must exist between public and private entities to maintain a high quality of urban forest; more emphasis on this partnership has the ability to promote sustainable urban forest management. Along with the partnerships, an increase in education and learning has the ability to facilitate a growth in public involvement in resource management and resource-use decisions.

As the conversations and learning processes occur our thinking can then shift to consider trees as beneficial green infrastructure. To help shift this thinking and to encourage private land owners and homeowners to have trees on their property, tools such as incentive programs or income tax breaks can entice tree planting and tree care,

ultimately encouraging residents to be stewards of the urban forest. Along with the incentives initiatives it is important to make these land owners aware of the intangible and tangible benefits that the trees bring to their property, whether this is the increased property value brought on by the trees, home energy savings (e.g., monetary savings from shade), the attraction of customers who prefer treed business areas, or the overall positive shift in positive well being and preferred natural environment.

2) Provide learning experiences for residents of all ages regarding the roles, values, and benefits of the urban forest.

Mezirow and other transformative learning advocates continue to provide research “confirming the essentiality of critical reflection, a disorienting dilemma as a catalyst for change” (Taylor 2007). Within transformative learning, critical thinking and reflection are not value-neutral. When adults question their own attitudes, reflect on personal values, and learn about the values of others, it can facilitate a shift in behaviour (Richardson 2008).

When thinking about trees, the current focus for many residents in Winnipeg is Dutch elm disease. It is necessary to move thinking and the discussion beyond disease control towards urban forest education to ensure future sustainability. This discussion can move forward if more residents are able to participate in activities such as the urban forest site tour that took place in this project or in activities put on by local organizations such as the Manitoba Forestry Association, Forte Whyte Alive Centre, or the City of Winnipeg foresters.

While all participants felt that providing people the opportunity to make a connection to nature is important, only 16 participants agreed that they feel connected to

nature in their daily life, and three disagreed with the statement. Early-age learning, whether informally through families or formally through the education system teaching children about nature, can impact values, associations, and connections made between residents and the sustainability of the urban forest. Participants reflected on the importance of learning and participating in formal and informal learning activities at an early age in order to gain a good appreciation of the forest, and to recognize how it contributed to their development of a reverence for trees during adulthood. Informal learning activities can occur for residents in their daily lives. When asked, the majority of participants considered a walk in the park to be an educational experience. The challenge is getting more residents out into the naturalized areas in their neighbourhoods to allow them to feel the 'escape' provided by the trees or the 'urban forest experience'. The findings of this research identified that participants were continually faced with learning opportunities throughout their adult life such as this research project. Through these learning opportunities we can begin to address the challenge of getting residents into naturalized areas. Activities put on by local organizations allow residents the feeling of escaping the busy urban life and improving their personal well-being.

3) Incorporate priority values of residents in urban forest management.

Values are a reflection of what really matters to society, while sensitivity to values provides insights for setting goals by identifying areas of priority, gaining stronger public support for policies, and allowing decision-makers to discover opportunities and new ideas (Xu and Bengston 1999). The relationship that residents of Winnipeg have developed with the urban forest is prevalent and visible in the responses generated and the importance of having natural spaces within the city setting was the top value for

participants. Participants described the psychological, aesthetic, and health impacts the natural ecosystems provide: *“a cognitive space here is again a historical, timeless, more mental space to inspire, ignite creativity”*, *“beautiful area that incorporates community living and a natural space”*. The trees provide a sense of nature with the ability to reconnect residents to the natural landscape.

Many participants felt that this co-existence of humans and nature in an acceptable balance has been achieved in neighbourhoods like Wildwood Park. Research has demonstrated that when connections to nature have been developed, individuals want to take action and protect nature (Sterling 2010; D’Amato and Krasny 2011). In Winnipeg, the fight against Dutch elm disease to preserve natural spaces stems from these strong connections and values held by residents. When asked about learning of management issues, Dutch elm disease and tree banding were common responses. This frequent mention of the concern for Dutch elm disease supports citizen involvement in discussion (Tree Help Ltd., 2007), and has been a crucial component of the health, conservation, and preservation of the elm forest in Winnipeg. So, involving people and tapping into the values they hold can be critical to the effective management of the forest.

The research identified residents’ five priority values, which could be integrated into different stages of urban forest. These values include natural, recreation, aesthetics, beauty, and shade and each could be incorporated into city planning strategies for new developments, or for the redevelopment of an area or property. Restrictions or requirements within policies such as low-impact development have the ability to ensure that these key values are recognized and can eventually become a standard practice.

There are numerous ways that the city could begin to incorporate these priority

values. The top value expressed by participants was natural, one way to address this is through the creation of naturalized areas within established parks – allow for undergrowth and natural regeneration with little interference or management, or perhaps plant species native to Winnipeg. As for the recreational value, under many circumstances participants’ linked recreation and nature, to address this we can look to include the types of recreation mentioned in or around these naturalized park spaces. When thinking about a method to approach how to apply sustainable management strategies for the aesthetic and beauty value categories, size and type of tree may provide opportunity for both public and private owners. Many participants discussed the overarching and far-reaching canopies of the elm trees that line the streets of older Winnipeg neighbourhoods. Many of the management strategies will apply solutions that address multiple values, size and type of trees planted can address the value of shade and having shaded areas especially around play structures for children – canopy, spacing, and density of the trees in and around the park.

6.5 Concluding remarks

The tenets and practices of sustainable forest management are as applicable to urban forests as they are to the rural forests of Canada. The urban forest is critical to our personal well-being and provides many ecosystem services. The urban forest is likely to be the most influential forest of the 21st century (Nowak et al. 2001; Dwyer et al. 2003), but it is also being profoundly affected by urban growth and climate change, among other stressors. This research helps to show that the connections residents have with the urban forest ecosystems are profound, in part because residents often experience the urban

forest on a daily basis. The resulting held values can drive campaigns necessary to save the trees, such as the ladies who fought to save the Wolseley elm.

In the end, understanding how much people value the urban forest helped me to realize how important laws and regulations that help to make our actions more sustainable really are. The current weakening of environmental laws and regulations will have profound impacts on the management of both our rural and urban natural resources.

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Appendix A Recruitment poster

Let's Talk About Trees!

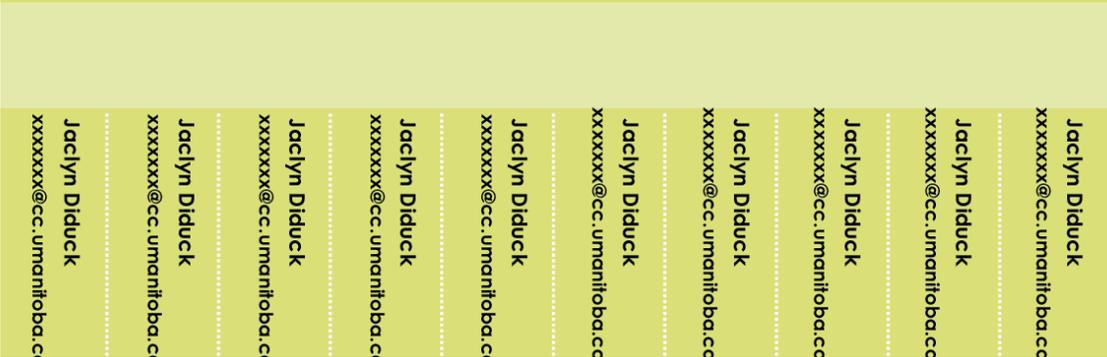
Volunteers Needed for Urban Forest Research Project!



The Faculty of Natural Resource Management at the University of Manitoba is conducting research on public values associated with Canada's urban forests. We are currently seeking individuals to participate in half-day (morning) field trips to various locations in Winnipeg. We are looking for a broad cross section of residents. No knowledge of forestry is necessary.

The study involves a half-day field trip to urban forest sites (transportation and lunch provided), recording thoughts in a participant journal, photography, and scheduled follow-up interviews.

If you are interested in being part of the study, or have any further questions, please contact Jaclyn Diduck at xxxxxxx@cc.umanitoba.ca or (204) xxx-xxxx (daytime phone) or Dr. John Sinclair at xxxxxx@cc.umanitoba.ca or (204)xxx-xxxx (daytime phone).



Appendix B Informed Consent

Natural Resources Institute
Clayton H. Riddell Faculty of
Environment, Earth, and Resources

Research Project: Understanding Local Values Related to the Urban Forest:
Connecting Winnipeg Residents to their Trees

Sponsor: Social Science and Humanities Research Council of Canada

Dear Research Participant:

This consent form, a copy of which will be left with you for your records and reference, is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

The objective of this research is to develop a comprehensive framework for urban forest values in Canada. The local research aims to develop an understanding of the urban forest values held by the residents of the City of Winnipeg. Data generated will be used in the completion of a Master's Student Thesis, and to inform urban forest management as well as creation of reports and journal papers.

We will use an innovative method involving a half-day field tour, participant photography, journal writing, and a follow-up scheduled interview. Members of the research team will take you to five or six sites throughout Winnipeg in a van. You will be given 20-25 minutes to explore each site, take photographs, and then record your impressions of it in a journal that we will provide. We will ask some basic information regarding your gender, education level, occupation and age, but you will not be identified as a participant and all the information that you provide us will be confidential. Only the local research team will know the participants and you will not be identified in any published work. We do plan to compare results across sites with researchers in Halifax, Calgary, and Fredericton however, those researchers will not be privy to your names, only your profile.

Following the site tour, you will be given a chance to complete the participant journals and we will finish up with a lunch. The half-day site tour will be complete by approximately 12:30pm. You will then be asked to take home with you the disposable camera to take photographs in your own neighbourhood or other places to further capture the values held in relation to the urban forest that are not represented in the photos taken

during the field tour. After approximately two weeks you will be contacted for us to pick up the camera, as well as schedule a follow-up interview to discuss the photographs taken on the site tour and on your own time. All of the costs related to photo development will be paid for by the researcher, all photographs will become property of the researcher. We will record the interview and transcribe them so that we can establish exact wording of participants. We will likely publish some of these, but again, without the use of any participant names. The transcripts will use false names or numbers to protect the identity of participants. A file that links participants' names to our codes will be kept in a locked office on a password protected computer and will be destroyed ten years after the termination of the project. This is simply to protect the identity and guarantee that participants will not be identified unless they wish to be.

I do not anticipate that your participation in this research should expose you to any risks beyond those you experience in the course of your work and daily life.

Your signature on this form indicates that you have understood to your satisfaction the information regarding participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time, and /or refrain from answering any questions you prefer to omit, without prejudice or consequence. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.

The University of Manitoba Research Ethics Board(s) and a representative(s) of the University of Manitoba Research Quality Management / Assurance office may also require access to your research records for safety and quality assurance purposes.

This research has been approved by the Joint-Faculty Research Ethics Board. If you have any concerns or complaints about this project you may contact Maggie Bowman, the Human Ethics Coordinator (HEC) at +1-204-474-7122. A copy of this consent form has been given to you to keep for your records and reference.

_____ I agree to participate. I understand that the interview will be recorded and that researchers may quote from my written or oral comments, but that my name will not be associated with any of my remarks.

_____ Signature _____ Date

_____ Name (printed)

If you have any further questions about this study you may call Jaclyn Diduck, the principle investigator at (204) xxx-xxxx. If you have concerns about the study, you may call Dr. Sinclair, the research supervisor at (204) xxx-xxxx.

If you are interested in receiving a summary of the results of this research, check the box below and be sure to add your full name and address in the space provided. When the project is complete, we will provide a summary and make you aware of published material that will result from this study.

Yes, I am interested in receiving a summary of this research (include contact details below).

Name:

Mailing Address:

Town or city:

Province:

Zip or Postal Code:

Country:

Email (optional):

Thank you,

Jaclyn Diduck and John Sinclair

Appendix C Participant Information

Let's Talk about Trees!

Participant Information

Thank you for considering participating in this study. This project falls within a larger research program with a purpose to develop a comprehensive framework for urban forest values in Canada. This local project is designed to develop an understanding of the urban forest values held by the residents of the City of Winnipeg. We will use an innovative method involving a half-day field tour, participant photography, journal writing, and a follow-up scheduled interview. Members of the research team will take you to five or six sites throughout Winnipeg in a van. You will be given 20-25 minutes to explore each site, take photographs, and then record your impressions of it in a journal that we will provide. We will ask some basic information regarding your gender, education level, occupation and age, but you will not be identified as a participant and all the information that you provide us will be confidential.

Following the site tour, you will be given a chance to complete the participant journals and we will finish up with a lunch. The half-day site tour will be complete by approximately 12:30pm. You will then be asked to take home with you the disposable camera to take photographs in your own neighbourhood or other places to further capture the values held in relation to the urban forest that are not represented in the photos taken during the field tour. After approximately two weeks you will be contacted for us to pick up the camera, as well as schedule a follow-up interview to discuss the photographs taken on the site tour and on your own time. We will record the interview and transcribe them so that we can establish exact wording of participants.

Appendix D Participant Journals**Understanding Urban Forest Values
Participant Journal**

Thank you for your time in participating in this study. This project falls within a larger research program with a purpose to develop a comprehensive framework for urban forest values in Canada. This project is designed to develop an understanding of the urban forest values held by the residents of the City of Winnipeg.

The tour today will consist of visits to sites in and around Winnipeg. At each site you will have the opportunity to spend some time to look around, answer questions in your participant journal, and take photographs with your cameras. At site #1 you will be given extra time to complete Part A of the journal as well as Part B. At the final site you will be given time to answer the Part B questions as well as the final thoughts in Part C. We will then have time for lunch and answer any final questions you may have.

Again, thank you for taking time to participate!

There are three parts to the Urban Forest Participant Journal

Part A First impressions

Part B Reflections on each urban forest site visit

Part C Final survey & final thoughts

Urban Forest Site Tour Camera Instructions

URBAN FOREST SITE TOUR:

You will be given time throughout the morning to take pictures of the urban forest. At each urban forest site visited today, please take some photographs of what you value most at each site. The aim is to have photographs that represent your own urban forest values. You are not required to take photographs at each location. If you do not value any part of the site we are visiting you are not required to take photographs. Feel free to be creative as possible when capturing your forest values. Please refrain from taking more than 12-14 photographs throughout the site tour. The remaining 12-14 will be used for the take home component. A follow-up interview will be scheduled at your convenience to discuss these photographs along with any you take after the field tour.

TAKE HOME:

You can take the provided camera home with you, to take pictures of what you value most at urban forest sites not visited today. You may choose to visit any sites throughout the city. You will be given approximately 2 weeks to take the photographs before I collect the cameras to have the film developed so that we can then schedule an interview. Please try to fill the camera with pictures and remember to be as creative pictures as you would like. At the scheduled interview we will discuss the photographs taken on the tour as well as ones taken on your own.

Thank you for participating in this study!

Part A: First Impressions Urban Forest

Answer questions 1-4. Feel free to read through all questions before beginning your responses.

1. To the best of your knowledge can you describe what would you consider as an urban forest? Give example(s) found in Winnipeg?

2. In your opinion, which of these following types of places do you consider to be an urban forest? (Yes or No)

Assiniboine Forest? _____
Kildonan Park? _____
Assiniboine Park? _____
University of Manitoba Campus? _____
The Forks Market? _____

3. If you were looking for information regarding the trees in our city where would you go to find information? (Whom would you ask?) (What would you ask?)

4. Have you had an opportunity to learn about the urban forest and/or trees? If so, give details of the opportunity, along with what you have learned?

Part A: First Impressions Tree Management

Answer questions 1-3. Feel free to read through all questions before beginning your responses.

1) Have you thought about who owns the trees?

Boulevard trees? _____

Parks? _____

Backyards? _____

Treed property? _____

2) Who do you think is responsible for the health of the urban forest in Winnipeg?
(List all applicable)

b) Who should be responsible?

2) c) What do you feel is the quality of the urban forest in Winnipeg? (Check)

Poor (needs major improvement)

O.K. (needs some improvement)

Good (needs minor improvement)

Excellent (no improvement necessary)

3) If you have an inquiry about the management of the urban forest in Winnipeg where might you turn for help? (Check as many as needed)

Media – newspapers, television, radio

Friends and relatives

Forest industry

Local government

Non-government organizations (e.g. ENGO)

First-hand visits to urban forests

Research scientists

3) b) Are any of these your primary source? Y or N

If yes, which one?

If no, please specify your primary source.

Part A: First Impressions

Urban Forest Values

Answer questions 1-4. Feel free to read through all questions before beginning your responses.

1. Do the **trees** in Winnipeg provide you and the city with any benefits? **Y** or **N**
If no, why not?
If yes, what benefits?

2. Do you think there are enough, too few or too many **trees** in this city?
Please explain.

<p style="text-align: center;">Part A: First Impressions Urban Forest Values</p>
--

3) Do the **forests** in Winnipeg provide you and the city with any benefits? **Y** or **N**

If no, why not?

If yes, what benefits?

4) Do you think there are enough, too few or too many **forests** in this city?

Please explain.

Part B: Winnipeg Urban Forest Tour

Site #1

1) Before today, approximately how often do you visit a place like this? (Check one)

- 7 days a week
- 4-6 days a week
- 2-3 days a week
- 1-2 days a week
- Never
- Other: Please specify:

2) Would you consider this location as an urban forest?

If yes, explain why?

If no, explain why not?

3) Please explain why you visit this place, or ones similar to it? Do places like this hold importance to you and the city?

b) What specific values are reflected for you at this site or what benefits does it provide to you?

c) Do you think that these values and benefits are similar for all residents of Winnipeg?

Part B: Winnipeg Urban Forest Tour

Site #1

Take a moment to observe your surroundings. Consider what captures your attention in this place.

You can now use your camera to take photographs of what captures your attention and what you value or hold as important.

After taking your photographs you can reflect and answer questions 1 & 2

1) What reflections, observations, and feelings do you have about this place?

2) How does this sort of treed space/forest contribute to the quality of life in Winnipeg?

Part B: Winnipeg Urban Forest Tour

Site #2

1) Before today, approximately how often do you visit a place like this? (Check one

)

- 7 days a week
- 4-6 days a week
- 2-3 days a week
- 1-2 days a week
- Never
- Other: Please specify:

2) Would you consider this location as an urban forest?

If yes, explain why?

If no, explain why not?

3) Please explain why you visit this place, or ones similar to it? Do places like this hold importance to you and the city?

b) What specific values are reflected for you at this site or what benefits does it provide to you?

c) Do you think that these values and benefits are similar for all residents of Winnipeg?

Part B: Winnipeg Urban Forest Tour

Site #2

Take a moment to observe your surroundings. Consider what captures your attention in this place.

You can now use your camera to take photographs of what captures your attention and what you value or hold as important.

After taking your photographs you can reflect and answer questions 1 & 2

1) What reflections, observations, and feelings do you have about this place?

2) How does this sort of treed space/forest contribute to the quality of life in Winnipeg?

Part B: Winnipeg Urban Forest Tour

Site #3

1) Before today, approximately how often do you visit a place like this? (Check one

)

- 7 days a week
- 4-6 days a week
- 2-3 days a week
- 1-2 days a week
- Never
- Other: Please specify:

2) Would you consider this location as an urban forest?

If yes, explain why?

If no, explain why not?

3) Please explain why you visit this place, or ones similar to it? Do places like this hold importance to you and the city?

b) What specific values are reflected for you at this site or what benefits does it provide to you?

c) Do you think that these values and benefits are similar for all residents of Winnipeg?

Part B: Winnipeg Urban Forest Tour

Site #3

Take a moment to observe your surroundings. Consider what captures your attention in this place.

You can now use your camera to take photographs of what captures your attention and what you value or hold as important.

After taking your photographs you can reflect and answer questions 1 & 2

1) What reflections, observations, and feelings do you have about this place?

2) How does this sort of treed space/forest contribute to the quality of life in Winnipeg?

Part B: Winnipeg Urban Forest Tour

Site #4

1) Before today, approximately how often do you visit a place like this? (Check one)

- 7 days a week
- 4-6 days a week
- 2-3 days a week
- 1-2 days a week
- Never
- Other: Please specify:

2) Would you consider this location as an urban forest?

If yes, explain why?

If no, explain why not?

3) Please explain why you visit this place, or ones similar to it? Do places like this hold importance to you and the city?

b) What specific values are reflected for you at this site or what benefits does it provide to you?

c) Do you think that these values and benefits are similar for all residents of Winnipeg?

Part B: Winnipeg Urban Forest Tour

Site #4

Take a moment to observe your surroundings. Consider what captures your attention in this place.

You can now use your camera to take photographs of what captures your attention and what you value or hold as important.

After taking your photographs you can reflect and answer questions 1 & 2

1) What reflections, observations, and feelings do you have about this place?

2) How does this sort of treed space/forest contribute to the quality of life in Winnipeg?

Part B: Winnipeg Urban Forest Tour

Site #5

1) Before today, approximately how often do you visit a place like this? (Check one

)

- 7 days a week
- 4-6 days a week
- 2-3 days a week
- 1-2 days a week
- Never
- Other: Please specify:

2) Would you consider this location as an urban forest?

If yes, explain why?

If no, explain why not?

3) Please explain why you visit this place, or ones similar to it? Do places like this hold importance to you and the city?

b) What specific values are reflected for you at this site or what benefits does it provide to you?

c) Do you think that these values and benefits are similar for all residents of Winnipeg?

Part B: Winnipeg Urban Forest Tour

Site #5

Take a moment to observe your surroundings. Consider what captures your attention in this place.

You can now use your camera to take photographs of what captures your attention and what you value or hold as important.

After taking your photographs you can reflect and answer questions 1 & 2

1) What reflections, observations, and feelings do you have about this place?

2) How does this sort of treed space/forest contribute to the quality of life in Winnipeg?

Part B: Winnipeg Urban Forest Tour

Site #6

1) Before today, approximately how often do you visit a place like this? (Check one

)

- 7 days a week
- 4-6 days a week
- 2-3 days a week
- 1-2 days a week
- Never
- Other: Please specify:

2) Would you consider this location as an urban forest?

If yes, explain why?

If no, explain why not?

3) Please explain why you visit this place, or ones similar to it? Do places like this hold importance to you and the city?

b) What specific values are reflected for you at this site or what benefits does it provide to you?

c) Do you think that these values and benefits are similar for all residents of Winnipeg?

Part B: Winnipeg Urban Forest Tour

Site #6

Take a moment to observe your surroundings. Consider what captures your attention in this place.

You can now use your camera to take photographs of what captures your attention and what you value or hold as important.

After taking your photographs you can reflect and answer questions 1 & 2

1) What reflections, observations, and feelings do you have about this place?

2) How does this sort of treed space/forest contribute to the quality of life in Winnipeg?

Part C: Final Thoughts

Take a moment to reflect on all of the sites visited this today. Feel free to read through all of the questions before answering.

Rate each of these statement based on the sites visited today.

1-Strongly Disagree, 2-Disagree, 3-Undecided, 4-Agree, 5-Strongly Agree

Site #1 is very important and captured all of my values. ____

Site #2 is very important and captured all of my values. ____

Site #3 is very important and captured all of my values. ____

Site #4 is very important and captured all of my values. ____

Site #5 is very important and captured all of my values. ____

Site #6 is very important and captured all of my values. ____

a) In your opinion, which was the most important site visited today? (Please explain)

b) And which was the least important site visited today? (Please explain)

Part C: Final Survey

Questions 1-15 Check all that apply

1. Where did you hear about this research project?

- From a friend
 Through work
 Email
 Facebook
 Flyer or poster, where? _____

2. How long have you lived in a city environment?

- Less than 1 year
 1-5 years
 5-10 years
 10-20 years
 20+ years
 All my life

3. How long have you lived in Winnipeg?

- Less than 1 year
 1-5 years
 5-10 years
 10-20 years
 20+ years
 All my life

4. How would you rate your knowledge level of environmental issues?

1 No knowledge	2	3	4	5 High
-------------------	---	---	---	--------

5. How would you rate your knowledge level of ecology?

1 No knowledge	2	3	4	5 High
-------------------	---	---	---	--------

6. Indicate to what degree you studied environmental issues in school.

	Not at all 1	2	3	4	Extensive 5
Primary					
Secondary					
College					
University					

7. Environmental issues are more important than economic issues.

- Strongly Agree
 Agree
 Undecided
 Disagree
 Strongly Disagree

8. Nature is resilient. We can manipulate it for our purposes and it will always bounce back.

- Strongly Agree
 Agree
 Undecided
 Disagree
 Strongly Disagree

9. Nature is fragile. If we are not careful in how we use land, we can upset the delicate balance.

- Strongly Agree
 Agree
 Undecided
 Disagree
 Strongly Disagree

10. Spending time in nature is important to me.

- Strongly Agree
 Agree
 Undecided
 Disagree
 Strongly Disagree

11. I consider a walk in the park to be an educational experience.

- Strongly Agree
 Agree
 Undecided
 Disagree
 Strongly Disagree

12. People are a part of nature.

- Strongly Agree
- Agree
- Undecided
- Disagree
- Strongly Disagree

13. A connection to nature is important to me.

- Strongly Agree
- Agree
- Undecided
- Disagree
- Strongly Disagree

14. I feel connected to nature in my daily life.

- Strongly Agree
- Agree
- Undecided
- Disagree
- Strongly Disagree

15. I never feel a personal bond with things in my natural surroundings, like trees, a stream, wildlife, or a view on the horizon.

- Strongly Agree
- Agree
- Undecided
- Disagree
- Strongly Disagree

Part C: Final Thoughts

Thank you for taking the time to participate in this study.

Please fill out contact information and availability in order to schedule a time for a follow-up interview and discussion of the site tour today, and the photographs taken.

Contact Information:

Name: _____

Phone: _____

Email: _____

Interview Availability:

(Circle days and indicate time)

Daytime hours: Mon, Tues, Wed, Thurs, Fri. _____

Evening hours: Mon, Tues, Wed, Thurs, Fri. _____

Weekend hours: Sat, Sun. _____

Appendix E

Understanding Urban Forest Values Interview Schedule

Part One – Urban Forest Photographs

Rating Pictures

- 1) Rate the pictures taken on the urban forest site tour into three groups: High, medium and low, from the pictures that best captures the most important values of the urban forest for you to the least important.
- 2) Rate the additional pictures taken on your time, into three groups: High, medium and low, from the pictures that best capture the most importance to the least importance.
- 3) Explain your reasoning of ranking selection. What did you have in mind when grouping the photos?

Discussion of specific pictures

(Set of questions for urban forest site tour – While we will look at all the pictures they have taken I hope to be able to discuss in detail the top 3 or 4 depending on time)

- 5) Where is this picture? (Confirm site location)
- 6) What is the focus of the picture?
- 7) What do you value most about the (urban forest) site in this picture? Why?

(Set of questions for own pictures)

- 8) Where is this picture? (Confirm site location)
- 9) Why did you choose to go to this site?
- 10) What is the focus of the picture?
- 11) What do you value most about the (urban forest) site in this picture? Why?
- 12) From all the pictures taken, during the site tour and on your own time, which picture best captures or is a reflection of what you value about the urban forest?
Or what you hold most valuable about the urban forest

General Value Question:

13) Can you try to explain why you think the values you have identified are so important to you? How did you think you developed such values?

14) Were they learnt? (How, where, why (choice or by requirement?))

15) Do you think your values change as the seasons change?

16) Do you think your own urban forest values change with tree size.

Part Two – Urban Forest Management

1) Was this study your first opportunity to reflect and think about the urban forest?

2) Did you learn about the urban forest during the field tour?

3) a) Have you ever learnt about urban forest management issues, like the need to prune trees, remove diseased trees, tree banding, tree care?

Yes/No

b) If yes, how did you learn these things?

(Workshop, job, experiences, neighbours, family, friends, other?)

4) a) As we visited different sites during the field tour the urban forest sites had several different owners. Did the change in ownership affect how you see and value the urban forest?

b) In your opinion does ownership impact how the urban forest is/or should be managed?

c) Is this positive or negative?

5) a) Do you think your friends and neighbours value the urban forest in Winnipeg? Please identify for me the signs and signals that lead you to feel one way or the other.

Yes/No

6) Do you have any other comments about urban forests in Winnipeg and/or the field tour and interview today?

Appendix F**University of Manitoba Pedestrian Survey on the Trees in Winnipeg**

Interviewer: _____ Date: _____ Time: _____ Location:
 _____ Sex: M or F

ABOUT TREES IN THE CITY

1. On a scale of 0 to 5, how important are trees in the city to you (with 0 being not important at all and 5 being very important)?

0 or 1 Do you think that trees in the city provide any benefits to residents?
 Y or N What would these be?

2 or 3 What benefits do city trees provide to people that gives them some importance?

4 or 5 What about the trees makes them that important to you and the city?

2. Which neighbourhood do you currently reside in?

Do you think there are enough trees in the neighbourhood?
 Y or N If not, where should more be planted?

Do you have any concerns about the trees in your neighbourhood?

3. Do you think there are enough trees in this city?

Y or N If not, where should more be planted?

4. What improvements would you like to see to trees in the city?

5. Where would you look for information on trees and their management in our city?
(Check all that apply)

- Media-newspapers, television, radio
- Friends, relatives
- Forest industry
- Local government
- NGO's/ENGO's
- First hand visits
- Research scientists
- Other

Have you ever used that/those resources?

Y or N

ABOUT YOU

6. In which decade were you born? 20s 30s 40s 50s 60s 70s 80s 90s

7. Are you Canadian?

Y -What is your home prov/terr? BC AB SK MB ON QC NB NS PE NL YT
NT NU

N - What is your home country?

8. What do you do for a living?

9. Are you a member of any environmental groups? N or Y - which ones?

FAREWELL QUESTION

10. Do you have any further comments about trees in the city?

Weather: _____

Notes: _____

Appendix G
Urban Forest Value Themes

(1) Aesthetics	(2) Naturalness and biodiversity	(3) Environmental quality and concerns	(4) Miscellaneous	(5) Personal Well-being	(6) Social Values
Aesthetics	Habitat	Air	Food/fruit	Shade	Sense of place
Beauty	Biodiversity	Air quality	Medicine	Health	Recreation (play, sit, have lunch, meeting place, walkways, play structure)
View	Green space	Cleans air	Property Value (\$)	Relaxation	Adds Character
Pretty	Greenery/green	Oxygen	Resources	Calm	Social Benefits
UF Colours (trees, leaves, sky, etc.)	Nature	Environmental benefits	Economic benefits (cooling costs, energy reduction)	Happy (happiness, etc.)	General overall benefits (felt by everyone)
<i>Tree size*</i>	Natural	Ecological Benefits	Privacy (privacy fence)	Peace (peaceful, peacefulness, etc.)	Urban forest 'experience'
Streetscape	Wildlife	Dutch elm Disease		Quality of life	Enjoyment (felt by residents)
	Native species	Buffer (or fence from elements)		Exercise (walking and jogging and leisurely)	Welcoming
	Non-native species	Carbon Storage		Emotions	Alternative uses (Art in the park)
	Elm Trees	<i>Tree size*</i>		Serenity	Safety
	Diversity (of tree species)	Shelter (from elements)		Spiritual	Socialize
	Sounds of nature	Water filtration		Family ties	Escape (to nature)
	<i>Tree size*</i>	Erosion control		Personal enjoyment	"Canadian" (identity)
	Urban Forest Atmosphere	Moderates temperature		Urban Forest connection	Community space

	Harmony (balance between nature and humans)	Pollution Control		<i>Tree size*</i>	Intrinsic Value
	Planting (tree planting)	Overall health (of urban forest)		Stress release (less stress)	Appreciation (for the trees and what they do)
	Canopy	Renewal (of the forest, naturally and human induced)		In close proximity to daily life and activities	Buffer from noise
				Quiet	

*- *Can be found in more than one category*