

'Go softly through nature please':
Assessing four paradigms of naturalized park design.

by

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Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners. I understand that my thesis may be made electronically available to the public.

Abstract

This study compared four prominent landscape design paradigms in a naturalized park landscape setting. The landscape designs included, natural state, visible stewardship, people places and physical accessibility. The selected landscape variables included preference, naturalness, accessibility and use. Three distinct participant groups were selected and can be categorized as, 'environmental or ecology', 'civically engaged around parks' and 'accessibility concerns in the public landscape'. The objective was to identify best practices in naturalized park design and to further existing academic research in the areas of landscape perception and preference. Three landscape types including open, riparian, and enclosed path were selected. The principles of the four design paradigms were applied. The methodology included the use of computer visualizations to provide for a common backdrop for the design implementations. Rating exercises as well as in-depth semi-structured interviews were completed. This research not only sought to determine what was preferred, but why it was preferred. The findings indicate that landscapes that are perceived as natural and designed to limit human influence and respect contextual 'fit' were most preferred. The research also uncovered a potential cognitive aspect of perceived accessibility in the landscape. The research findings highlight the depth of connection to naturalized park landscapes among all participants and a higher degree of similarity than expected in terms of expectations and wants among the participant groups.

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...we hypothesise that for any landscape, or major portion of the landscape, there exists an optimal spatial arrangement of ecosystems and land uses to maximize ecological integrity. The same is true for achieving basic human needs and for creating a sustainable environment. If so, the major but tractable challenge is to discover the arrangement. (Richard Forman as cited in Thwaites et al., 2005, p.525)

Introduction

1.1 Overview

This research is specifically focused on how to optimally design naturalized parks. As parks are important public spaces, they need to be planned, designed and managed in a manner as to best support their continued use and enjoyment. Non-use of parks is a significant barrier to public and political support. Accordingly, the planning, design and management of parks need align with public expectations and wants. However, for every park user there may be a different definition of what the purpose of a park is and accordingly how it should be developed and managed. This research directly addresses the need to develop an understanding of the best planning, design and management practices specific to naturalized parks to ensure their continued support and use.

Based on an extensive overview of the fields of planning, urban design, landscape architecture, leisure and recreation studies, aesthetics and environmental

psychology, a number of park design paradigms that transfer well to a naturalized landscape were identified. These paradigms are termed natural state, visible stewardship, and people places. They have been defined as paradigms because they are tied to theory, and accordingly hold grounded assumptions as to human relationships with environment, place and nature. Therefore, they are robust notions of how to best design.

This research also seeks to explore accessible design in naturalized parks. Although the accessible design paradigm, as implemented in naturalized parks, has yet to be studied in great depth it is considered to be an important social imperative. Generating accessibility in naturalized park landscapes can be theoretically tied to the importance of such places as landscapes for restoration and wellbeing. Furthermore, the generation of accessible landscapes has become a policy priority of the Government of Ontario. The Ontarians with Disabilities Act 2001, requires Municipalities to develop accessibility plans, set strategic goals to reduce barriers to accessibility. While a reading of the Act indicates that the primary focus is the built environment and structures, parks, as municipally owned public spaces will most likely be held to similar standards.

This study seeks to explore design in naturalized parks through a grounded comparative exercise. It will focus on four variables, referred to as landscape values: preference, naturalness, accessibility and use. Preference is how much a landscape is 'liked', naturalness, the extent to which the landscape is in a natural state, accessibility, is the degree of physical access the landscape provides, and use is the likelihood of use. While preference has been broadly studied, limited research is available which

independently operationalizes naturalness, accessibility or use. Generally, the variables are implemented and tested *in relation* to preference. Therefore there is limited information available as to what shapes perceived naturalness, accessibility and use in the naturalized park visual landscape. The inclusion of accessible design as a paradigm within this study of naturalized park design is important, as it has not yet been the focus of a primary research project. Accordingly this research has identified a number of research gaps. The primary research gaps that this research seeks to address include:

- 1) How are preference, naturalness, accessibility and use conceptualized in the visual landscape of naturalized parks?
- 2) Is there an 'optimal' way to manage and design naturalized parks to gain broad preference, use and support across different users?
- 3) What are the impacts of incorporating standard physical accessibility design practices in naturalized park landscapes?

1.2 Context

Parks are important places. They may represent the only open space an individual has immediate access to in a built up urban area, or for others an important place to 'get away' or even a place of civic pride. Parks provide locations for numerous activities, allow for passive and active recreation, and provide an open public location for events and gatherings. They can also be informal places for chance interaction and socialization. They are landscapes of discovery, learning, and play.

There are a wide variety of parks. From large central or city parks, to small pocket parks, from small community parks, to provincial or national parks and reserves.

Parks are not easily limited through their definition. At the core, a park is a public place, open to everyone and represents a place differentiated from the surrounding built urban form or rural environment through form, function or social recognition and importance.

Naturalized parks are a certain kind of park. They are predominantly defined by the presence of natural elements and often are limited in the visibility of human intention or purposeful design. That is not to say the design of naturalized parks is unimportant or nonexistent. In a similar fashion to all other parks, design and layout play a critical role in defining the place and establishing a sense of place. To say that naturalized parks are without design and intention is incorrect. All parks, including naturalized parks, are subject to some form of purposeful design.

A study by Ozguner and Kendle (2006) indicated that the public is able to differentiate between naturalized and more obviously designed or formal park landscapes. Their study found that both types of parks were viewed as being natural and both were seen as important, as different benefits and some similar benefits could be derived from both types. However, the more naturalized park was more strongly associated with the values of 'sense of naturalness', 'freedom', 'socialize' and 'beneficial to wildlife'. This would tend to support the idea that naturalized parks better provide specific and important social values over more formal parks, even though formal parks are still associated with being natural.

Naturalized parks are further assumed to be important public spaces as they are dominated by natural elements. Previous research in the fields of environmental

perception and environmental psychology has indicated that landscapes that are predominantly comprised of natural elements are consistently highly preferred, or 'liked' (Ulrich, 1986; Kaplan & Kaplan, 1989; de Groot & van den Born, 2003). Furthermore, recent research has shown that exposure to nature and natural landscapes are critical components of human health and wellbeing (Chang et al., 2008; Kaplan, 2001; Grahn & Stigsdotter, 2010; Hartig et al., 2003). For example, a review by Pretty (2004) concluded that detached (i.e. through a window or books), passive and active exposure to nature all contributed to mental and physical health. This work is further supported by Kaplan (1995; 2001), and a review of sixteen years of research presented in *Landscape and Urban Planning* (Matsuoka & Kaplan, 2008). These findings and others (for example, in a rural context, Wells & Evans, 2003) suggest such a strong relationship between nature, wellbeing and health that contact with nature is being promoted as an important public health intervention (Maller et al., 2005).

Additionally, more natural parks have been shown to have social value as places for gathering, learning, and exploring (Shin et al., 2005) – tangible and intangible human needs, often cited as requirements for the development of sustainable cities (Chiesura, 2003) and vital neighbourhood spaces (Sullivan et al., 2004). Some have even extended these important social values to 'wasteland' landscapes, such as abandoned industrial or brownfield sites which host spontaneous wilderness regeneration, theorizing a new form of post-modern wilderness (Jorgensen & Tylecote, 2007). The need for contact with nature is not a 'rural romanticism', rather it is a critical aspect of sustainability in our increasingly urban societies (van den Berg et al., 2007).

Naturalized parks are also a primary example of the interface between ecological landscapes and environmental aesthetics, or more simply put, the wild and the tame, the non-human and the human. Despite the importance of this intersection, there are yet unanswered questions as to how best bridge the gap between these two aspects of naturalized parks. It is clear that given the social, ecological and socio-environmental values of naturalized parks, research that explores this interface is of critical importance (Parsons, 1995). Accordingly, this research focuses on the design of naturalized parks to determine the most suitable means of balancing and bridging ecology and visual environmental aesthetics with the functionality required in public parks. Ecology, environmental aesthetics and functionality, in reference to naturalized parks, do not exist in a vacuum. This intersection needs to be evaluated in light of park users and their perception and assessment of the resultant visual landscape.

1.3 Research Questions and Hypotheses

Based on a review of primary research, four landscape variables were selected for this research as they are critical components of naturalized park visual landscapes. These variables were preference, naturalness, accessibility and use. To some extent there are linkages between the four design paradigms and these variables, however they were selected independently as a means to assess the design paradigm implementation.

Given an objective of this research is to determine how to best design naturalized parks, it is hypothesized that these variables will coexist in a complex interface. For example, intuitively the best design should generate highly preferred

landscapes. It is assumed high preference will increase the likelihood of use. Furthermore, previous research has shown that increased naturalness has been consistently linked to higher preference. Exposure to nature, as typified by a landscape with high perceived naturalness, is an important element in human health and wellbeing; a topic that parallels physical impairments and accessibility. Increased accessibility may also increase use, however it could reduce perceived naturalness and therefore preference and possibly use.

As the brief discussion above highlights, design in naturalized parks is a complex interface of visual landscape values. It is not clear as to how these values interact, detract or support each other. There is a need to understand not only how to create highly preferred landscapes, but also how to create landscapes that have an appropriate level of perceived naturalness, a high level of use and a high level of accessibility to all users. This research holds that the best design practices for naturalized parks will balance these variables.

To further complicate the matter, it is expected that each individual park user will be motivated in their landscape choice and use through their individual landscape needs and wants. Accordingly, it is not only important to understand the impact of each design paradigm on the landscape, but also how it impacts user assessments of how 'fitting' it is. Three main subject groups have been selected as a part of this research. These groups can be broadly defined as naturalists or environmentalists, those engaged in civic discussions around parks, and those who self-identify as having accessibility concerns in public places. These three subject groups were purposefully selected, as

they were expected to have the strongest responses to landscapes that are reflective of the four design paradigms. Therefore, their responses can be used to provide an indication of how these landscapes compare to each other, and if the design paradigms will generate significantly different responses and assessments. This may also provide an indication of areas where there is agreement or consensus thus indicating areas of cross-paradigm best practices. These areas of congruence will be important for planning professionals and future research.

Again, this research seeks to evaluate the selected design paradigms, being natural state, visible stewardship, people places and physical accessibility, in relation to each other and specifically for the naturalized park landscape. Studies have been completed in the past to test the preference for and appropriateness of the four paradigms. However, based on an extensive literature review, no study has been completed to date that through participant rating and qualitative landscape exploration tests these design paradigms in relation to each other. This may primarily be due to the difficulty in objectively evaluating each design paradigm on a consistent basis or 'backdrop'. This research utilizes the process and method of landscape visualization to provide this foundation for comparison. Furthermore, the landscape values of preference, naturalness, accessibility and use will be assessed for each design paradigm as they are thought to be important components of subject evaluations. Furthermore, three specific subject groups will be used as they are expected to have the strongest response to the selected design paradigms, and will accordingly provide insight into the relationship between park user, visual landscape values and naturalized park design.

This research will seek to explore the above noted topics through the following four research questions:

- 1) What are the relationships between the four design paradigms a) natural state, b) people places, c) visible stewardship, and d) physical accessibility and the four landscape values a) preference; b) naturalness; c) accessibility; and d) use?**
- 2) What are the similarities and differences in landscape value judgments for different groups for naturalized park landscape designs?**
- 3) Of the four identified design paradigms does a particular design paradigm best suit naturalized park landscapes?**
- 4) How does accessible design relate to the naturalized park landscape?**

Based on the existing research on human preference for nature, it is expected that all landscapes will be generally preferred. The landscapes that incorporate a higher degree of visible human intention or human made elements, such as the accessible landscape, may have a lower overall preference rating and will be perceived as having a lower level of naturalness. The assessment of use of the landscape will primarily be a function of the landscape fitting with the individual's use and value orientation. Essentially, individuals will be more likely to use those landscape that provide the affordances they seek. It is unknown as how accessibility will be assessed by participants. From a functional standpoint, those landscapes that provide for increased ease of movement should be viewed as more accessible.

Based on the literature it is expected that the more natural the landscape, the more it will be preferred by those with naturalist values. It is also hypothesized that

natural landscapes will be generally preferred amongst those involved in civic discussions around parks, as natural landscapes have continually been shown to be highly preferred by a wide range of the general population. However, given this group's support of parks as places for people, there may be a greater acceptance of purposeful design in natural landscapes. Generally there is very limited research completed to date that would allow for the drawing of a hypothesis as to how those who require accessible landscapes will respond to the design paradigms. From a practical standpoint, it is assumed that this group will prefer the more accessible landscapes, as it would facilitate their use of the landscape. However, they may also be drawn to the landscapes that show less human intention as these landscapes have been shown to better support health and well-being.

As each design paradigm is backed by its own set of theory, assumptions and primary research, it is difficult to provide a clear indication as to which design paradigm, if any, will be highly preferred amongst all user groups. Rather, it is expected that each design may find support amongst each type of user based on their use and value orientation. However, it is important to note that there may be areas of consensus or opportunities for cross-boundary design and such findings would be useful in informing current and future practice and research.

Accessible design in natural landscapes may not fit with traditional or modern aesthetic foundations to generate high levels of preference. However, there is the possibility that those groups which do not require accessible elements in the landscape may see the accessible design elements as fitting an important social imperative and

therefore are acceptable in the landscape. However, it is not clear if this cognitive assessment of accessibility in natural landscapes will still fully support higher preference ratings. Landscape preference research has indicated that the inclusion of human-made elements and purposeful design in natural landscapes tends to decrease preference. On the other hand, accessible landscapes may indicate a higher degree of maintenance and landscape care, and therefore increase preference.

1.4 Thesis organization

This thesis is divided into five chapters. The current chapter is meant to provide a general overview of this research project and the primary questions and research gaps it seeks to address. The second chapter will provide an extensive literature review. A number of key topics are discussed, which inform the four design paradigms, selected landscape values, the selected methodology and the results of this research. The third chapter provides an overview of the theoretical foundations of the selected research methodology, outlines the visualization development process, and the participant testing and analysis methods. The fourth chapter provides an overview of the results of the research. The fifth chapter is an exploration of the research questions and further discusses the results in light of the professional practice of planning. It additionally provides a discussion of the limitations of this research and future research directions. There are a number of appendices attached to the back of this thesis containing the park landscape colour map created for visualization development, the stimulus set (visualizations) used, and the survey instrument.

Literature Review

2.1 Introduction

This research is informed by a number of bodies of research including aesthetics, urban planning and design, landscape assessment and environmental psychology. The theoretical foundations of this research extend predominantly from aesthetics and environmental psychology. These interesting and multidisciplinary fields focus on the relationship between people and place and how they shape and inform each other. A wide reading of the literature from the aforementioned fields was undertaken as well as the fields of landscape architecture and leisure and recreation studies. From this reading the most pertinent information has been gathered and synthesized into the following literature review, which provides the foundation for this research. This literature review draws together a number of areas of interest, each with their own theoretical foundations, methodological practices, terminology and lexicon. Accordingly, this literature review focuses on providing a synthesis structured around a common thread of people and places. The review is structured in a funnel-like fashion with the broader concepts and ideas presented first and then narrows into greater depth of detail and specific relevance to the research undertaken.

The literature review begins with an exploration of the theoretical foundations drawn from the field of aesthetics. The discussion begins with two competing aesthetic paradigms, one traditional, the scenic aesthetic, and one more contemporary, the ecological aesthetic. The section is completed with a synopsis of a contemporary interpretation of the role of landscape aesthetics in modern society. The next section

moves to the concept of aesthetic judgments of landscapes. This area of study, termed landscape assessment, is explored in the context of two competing paradigms, the objective and the subjective approach. The next section is a further exploration of an aspect of the subjective approach, namely landscape preference research. A brief overview of the competing paradigms related to the mechanisms of preference judgments is provided. The sections following that provide a concise review of the body of primary research findings and themes related to the four landscape variables, preference, naturalness, use and accessibility. The final section outlines the four design paradigms that are the focus of this research and succinctly places each in the broader context of the material outlined above.

2.2 Aesthetics

This research is fundamentally about aesthetics, the ‘what’ and ‘why’ of the naturalized park visual landscape. An understanding of aesthetics is critical to both the development of the research focus and methods and the analysis and discussion of the research results.

Aesthetics, sometimes referred to as esthetics, is the philosophical foundation behind assessments of the visual world. The philosophy of aesthetics seeks to determine why and how people view, judge and describe the world around them. A common question asked is ‘what is beautiful and why?’ While the ‘what’ may not be hard for an individual to answer – the ‘why’ generally is.

Landscape aesthetics, more specifically, the aesthetics of nature has been a contested philosophical field for centuries. From Kant to modern interpretations and

assertions, academics, philosophers, poets, artists and laypersons have attempted to understand and describe human attachment to the natural world and the origins and basis for this attachment.

Two theories of aesthetic appreciation that inform this research theoretically and procedurally are outlined below. The first is the scenic aesthetic. A brief overview of this notion of aesthetic experience is provided as it informs a latter discussion on landscape assessment methodologies. A more in-depth discussion is undertaken of a newer theory of aesthetic experience termed the ecological aesthetic. This theory is particularly important in that it: 1) informs the landscape assessment methodology; 2) is a foundation for two of the design paradigms; and 3) it deals directly with the aesthetics of predominantly natural landscapes in the context of a modern society. As such, the concept of the ecological aesthetic can be viewed as one interpretation of Nohl's (2001) 'future' or post-modern landscape aesthetic.

2.2.1 Scenic Aesthetic

The historic roots of the aesthetics of nature lie in 18th Century philosophy concerning aesthetic appreciation of nature, notably the works of Kant (Budd, 1998a, 1998b, 1998c). Kant's notion of the sublime is based in a pure aesthetic judgment. The aesthetic appreciation of sublime nature is founded in concepts such as boundlessness, immensity, matter, extent and power (Budd, 1998c). In Kant's theory of nature as sublime aesthetic experience lies outside of interpretation, knowledge and conceptualization. Instead, the scenic aesthetic, based in Kant's notion of the sublime,

is predicated on awe and wonder. As such, the scenic aesthetic has often been associated with the romantic or the naïve.

However, modern interpretation of the scenic aesthetic such as that of Parsons and Daniel (2002), hold that the scenic aesthetic is important in that it allows for a viewer to generate an emotional connection to visual landscapes, thus deepening their appreciation of that landscape and therefore supporting conservation and sustainability goals. Brady (1998) supported this argument as she saw imagination, in the forms of exploratory, projective and ampliative, together with perception, playing a critical role in aesthetic experience with nature.

2.2.2 Ecological Aesthetic

During the second half of the 20th century there was a strong renewal in philosophic discussion concerning the aesthetics of nature. Carlson and Berleant (2004, p. 14) attributed this renewed interest to a growing public awareness of “aesthetic quality and value of the natural environment.” Carlson and Berleant also noted (p. 14) the importance of Ronald Hepburn’s 1966 article “Contemporary Aesthetics and the Neglect of Natural Beauty”, in which he suggested that features of the natural world that “other philosophers have seen as aesthetic deficiencies ... and thus as reasons for deeming its appreciation subjective, superficial, and even non-aesthetic, are actually sources for a different kind of, and potentially very rich, aesthetic experience.”

Since the publication of Hepburn’s seminal article, the theory of environmental aesthetics has expanded greatly. A number of important ideas from the field inform the development of an ecological aesthetic. Most notable is the debate on the root of

aesthetic appreciation of the natural world. Carlson (1979) proposed that the aesthetic appreciation of nature is derived from knowledge, specifically knowledge of science and the natural world. This theory has been termed 'scientific cognitivism' (Parsons, 2002) and has been supported and furthered by others (Matthews, 2002). The concept of scientific cognitivism provides the foundation for the ecological aesthetic and the associated appreciation of nature. An ecological aesthetic predicated on scientific cognitivism can be viewed as being directly opposite the scenic aesthetic.

The popular notion of an ecological aesthetic is generally imparted to the work of Aldo Leopold and his development of the philosophy of the 'land ethic' (Gobster, 1995, 1999, 2001; Sheppard, 2001). Gobster et al. defined the ecological aesthetic as "expanding the scope of landscape aesthetics to explicitly incorporate ideas about ecological processes" (2007, p.962). At its core it holds that the aesthetic appreciation of a landscape should be informed by ecological knowledge (Sheppard, 2001).

Ecological aesthetic theory holds knowledge of the ecological systems as the mechanism to generate 'deep' understanding of landscapes and provides a mechanism to change and subsequently enhance aesthetic appreciation of a landscape. In this manner the theory advocates for appreciation of nature for what it is - a complex system existing at many scales, which is subject to change and flux. This notion has been further supported by Saito (1998). Saito (2002, p. 259), citing the works of "aestheticians, practitioners, and activists" such as Aldo Leopold, Holmes Rolston III, and Allen Carlson, clearly articulated the need for, and concept of an ecological aesthetic.

I believe that we need to cultivate an ecologically informed nature aesthetics that aligns the positive aesthetic value with what we decide to maintain as ecological health and well-being. The ideal towards which the design profession and aesthetic education should guide us is the merging of the positivist aesthetic value and what is determined ecological value; there is no logical reason that they have to be separate.

He further noted that there is a need to develop an:

...aesthetic appreciation of what may appear on the surface to be aesthetically negative, which are nonetheless ecologically valuable. These include 'desiccation, death, and decay that are part of a natural cycle,' 'distinctly weedy or dormant phases and multi-seasonal change' as integral parts of ecologically sensitive gardens, forest burnt by wildfire, maggot-infested animal carcass devoured by a predator, mangrove swamp which is 'dark, mosquito infested, almost impenetrable with knee-deep muck and tangles of roots,' and the like.

Importantly he followed this with, "I believe that developing such aesthetic sensibilities is possible with appropriate education" (p.259). Notwithstanding the examples cited by Saito, he clearly exemplifies the central concept of an ecological aesthetic - the aesthetic appreciation of nature as nature.

It is important to also note theories of the aesthetic appreciation of nature that incorporate human elements such as emotion (Carroll, 1993; Foster, 1998), mystery and incomprehension (Godlovitch, 1994), and imagination (Brady, 1998). These theories may highlight other manners in which types of non-scientific knowledge could be constructed or used in an aesthetic appreciation of a natural environment.

A number of concerns have been raised concerning the development of an ecological aesthetic. Works have questioned whether it is premature or necessary (Parsons & Daniel, 2002), and the normative assumptions inherent in the theory (Parsons & Daniel 2002; Daniel 2001). Daniel (2001) and Sheppard (2001) noted the problem of determining what is a good ecological system. Still others have asked how

to contend with notions of inherent biologically driven preferences (Parsons & Daniel 2002; Sheppard, 2001), or with emotional attachment of a person to a landscape, or a person's 'selfish' motives (Sheppard, 2001), or competing value systems (Gobster, 2001). Others have held that it is inappropriate that everything in nature can and should be aesthetically appreciated (Saito, 1998).

Still others have held, that despite the shortcomings noted above, a complex ecological aesthetic has significant "potential to promote environmental health, while being regionally grounded, and can help face the challenges that globalization poses to the landscape" (Egoz & Bowring, 2004, p.57). The significance of scientific cognitivism and the ecological aesthetic is that it asserts that natural systems and landscapes which do not 'fit' the traditional notion of natural beauty or the sublime, can generate a positive aesthetic experience and can be beautiful even though they may be 'messy'.

2.2.3 Aesthetics in an 'An-Aesthetic' World

One important contemporary article related the subject of landscape aesthetics is that of Nohl (2001). In this seminal work, Nohl postulated that the traditional landscape aesthetic based on the philosophy of Kant and others has become outdated due to the landscape changes inherent in the cumulative impact of modern humans on the landscape. Nohl held that just as landscapes evolve and change, so too do the foundations for and leaning behind aesthetic appreciation. He noted that today there simply are not the same landscapes upon which Kant's notions or aesthetic appreciation were developed and applied – that we have entered into an 'an-aesthetic' state of landscapes. Rather, he postulated a modern landscape aesthetic, and a new paradigm

for sustainable landscape aesthetics. He held that this aesthetic is a cognitive process, and is explored at four levels – the perceptual, the expressive, the symptomatic and the symbolic. Through this assessment, Nohl developed four new categories for landscape perception that are the foundation of a new aesthetic appreciation. The categories were the beautiful, the (new) sublime, the interesting and the plain. While some are similar in name to traditional notions of aesthetic appreciation, these categories are underlain by a cognitive process and are reflective of a modern landscape patchwork and a modern society where sustainability has become a core principle. Nohl's concepts are apparent in other works including Jorgensen and Tylecote's (2007) 'ambivalent landscapes.' These works relate to this research in that they indicate a shift in contemporary notions of aesthetics and a modern aesthetic based on emotion and knowledge, the viewer and the landscape. These works indicate the possibility of there being a complex aesthetic in naturalized park landscapes.

2.3 Visual Landscape Assessment

This research is fundamentally about judgments of the visual landscape. The practice of making or soliciting judgments of the visual landscape for the purpose of public policy development or furthering academic understanding is also known as landscape assessment. Visual landscape assessment originated as a technocratic or expert driven exercise. At its core, evaluative models were developed and applied by experts to assess the scenic beauty of a landscape. To an extent this objective assessment of the landscape corresponds to the scenic aesthetic. However, visual landscape assessment also gave birth to landscape preference research. Preference

research was a method used to incorporate the public in understanding landscapes and assessing their visual value (Zube et al. 1975). Landscape preference research can be seen as a response to the expert paradigm.

2.3.1 Visual Landscape Assessment – Objective Approach

The field of visual landscape assessment grew out of the 1960s and 1970s when advancements in social and economic systems started to place significant pressure on natural resources and landscapes. This was coupled with an increasingly mobile society with greater time to experience wilderness and natural landscapes. Both social and political calls were made to protect visual landscapes from degradation. Predominantly, visual landscape assessment sought to develop a method to determine the scenic beauty of landscape in an attempt to determine which landscapes were vulnerable or needed to be protected from development such as logging or mining.

A great amount of work was completed which sought to develop a method to predict scenic beauty. Examples include the development of descriptive techniques to determine the scenic beauty of forest environments (Arthur, 1977), the statistical technique of Dearden (1980), the points and ratings classification system of Sargent (1966), the Scenic Beauty Estimation (SBE) method (Daniel & Boster, 1976) or the predictive modeling of Brown & Daniel (1986). Others have attempted to develop a framework of landscape indicators (Ode et al., 2008) that was linked to aesthetic theory. While to some extent the concept of scenic beauty has fallen out of style, for others it remains a core aspect of exploring the visual landscape (Daniel, 2001; Parsons & Daniel, 2002).

2.3.2 Visual Landscape Assessment -Subjective Approach

A key component of objective visual landscape assessment is the involvement of the expert and the objective or positivist nature of the assessment. There grew a subsequent call to provide for public involvement in landscape assessment and to explore subjective elements of landscape quality (Jacques, 1980; Penning-Rowell, 1981). Even though from early on public participation in landscape assessment was viewed as important and necessary, there were questions as to how it could be best accomplished (Dearden, 1981). One method developed to achieve this was the use of preference testing, which sought to elicit public assessments of landscapes based on how much they 'liked' or 'disliked' a particular landscape. Landscape preference research has further expanded to not only focus on what is preferred, but why. This has allowed for great insight to be gained into the role of landscape elements, and their relationship to each other and the viewer.

The opening of landscape assessment to a subjective approach has in effect created many more questions than it has answered. Through an exploration of the subjective elements of landscape assessment and appreciation it became difficult to form generalizations about the value of visual landscapes. Despite this, the deepening insight that has been gained through the preference assessment model, has allowed for its use in a broad array of academic research. For example, research such as that of Kaplan (1987), which has attempted to explain human perception of landscape through preference analysis, has provided great insight within the field of environmental psychology.

2.4 Preference in the Visual Landscape

The opening of landscape assessment to the subjective approach was predominantly achieved through the adoption of preference testing. While originally a means to provide for public participation in planning decision making, preference testing opened the door to a much deeper body of academic scholarship and knowledge about the human-landscape relationship. The following is a discussion of primary research findings related to landscape preference theory, preference for nature, preference for landscape elements and subject variables that influence preference. These findings directly inform the research hypotheses and results.

2.4.1 Landscape Preference Theory

In terms of a theory of visual landscape preference, two competing paradigms have developed, one, a biologically driven model of preference, and the other, a culturally driven model of preference. The next section provides a brief overview of these contesting theories as to the origin of why we 'like' what we like.

2.4.1.1 Biological Theory

During the mid to late twentieth century a variety of concepts of the human-landscape preference formation process were theorized. This followed in the wake of Appleton's (1975a) assertion that landscape assessment and design was operating within a "theoretical vacuum." Biological theories were primarily founded in the premise that environmental stimuli, which are intrinsic to the landscape, are the fundamental factor in human judgments of landscape preference (Orians & Heerwagen, 1992). One such example is that of Appleton's (1975b) prospect and refuge theory,

which held that the landscapes predominantly preferred by humans are those that allow for the biological requirement of being able to see without being seen. This allowed for landscape visibility, or prospect, and security, or refuge. This would be considered an expert driven approach to landscape assessment. Balling and Falk (1982) through a preference study approach found some limited support for this theory in that participants were predisposed to landscapes that fit the typical savanna type. This gave credence to Appleton's theory as savanna type landscapes often combine a mix of open areas, 'prospect' and edges, 'refuge'. Appleton's theory has been further supported by tree shape preference research by Summit and Sommer (1999). Other theories such as the information processing theory (Kaplan, 1987; Kaplan, 1992) note the role of human cognition in the process of landscape perception. This model was again developed through the subjective landscape assessment methodology of preference testing. From the preference results of participants the authors theorized that, "preference came to look like an expression of an intuitive guide to behavior, an inclination to make choices that would lead the individual away from inappropriate environments and towards desirable ones" (Kaplan, 1987, p. 15). Another significant work in the field that has been cited as foundational in exploring human landscape preference was that of Edward O. Wilson's biophilia hypothesis (Kellert & Wilson, 1993) which attests to a intrinsic link between humans and living systems.

Generally, biological theories of landscape preference can be viewed as being tied to an objective and positivist theory of aesthetic appreciation, and as such the scenic aesthetic. In other words, the visual landscape lies outside of the viewer and

triggers innate emotional responses that are biologically pre-ordained as a consequence of millennia of evolutionary development.

2.4.1.2 Social Constructivist Theory

The social constructivist theory of landscape preference counters the notion that landscape preference is an inherently biological predisposition of humans. Under the social constructivist theory the cognitive realm incorporates the experience of the landscape, and preference is generated through the interaction of observer with landscape, which creates meaning and association. As Meinig (1976, p. 47) contested, “any landscape is composed not only of what lies before our eyes but what lies within our heads.”

The physical environment and landscape is transformed symbolically through the cognitive process. As Greider and Garkovich (1994, p. 1) noted “Landscapes are the symbolic environments created by human acts of conferring meaning to nature and the environment, of giving the environment definition and form from a particular angle of vision and through a special filter of values and beliefs.” Lowenthal (1978), in a discussion of highly valued landscapes, noted the importance of participation and experience in the generation of preference. He argued, “The admiration of landscapes depend so much on our physical interaction with them that no aesthetic consensus based purely on scenic criteria could adequately reflect our appreciation” (p. 375).

One holistic account of the social constructivist experience of landscape is found in the work of Yi-Fu Tuan and his groundbreaking theory of topophilia. As Tuan describes it (1974, p.4), “topophilia is the affective bond between people and place or

setting.” In so describing topophilia, Tuan supported the notion that landscape appreciation laid in the cognitive and affective response between the viewer and the landscape.

Social constructivist theories of landscape preference can be generally tied to a more subjective theory of aesthetic appreciation, such as the ecological aesthetic outlined above. In this case, knowledge of the natural world is the filter that provides landscape meaning and subsequently supports landscape preference. It is through social constructions, such as scientific knowledge or an environmental or land ethic that landscapes are given meaning and value.

2.4.2 Preference and Nature

The general preference for natural landscapes has been well established within the literature. Numerous studies have found that natural landscapes, as opposed to human dominated landscape, such as urban landscapes, are highly preferred (see for example Ulrich, 1986; Kaplan & Kaplan, 1989; de Groot & van den Born, 2003). It has been found that the incorporation of vegetation or the ‘greening’ of urban sites both increases subject preference for those sites (Ulrich, 1986) and the use of those sites (Sullivan, Kuo & DePooter, 2004).

This bodes well for naturalized parks, which are typified by highly natural environments with limited human influence and purposeful design. The majority of existing research seems to indicate that a wide spectrum of users will prefer more natural landscapes, like those found in naturalized parks.

However, a growing body of research has come to refine the consensus theory of natural landscape preference, highlighting the differences that do exist in relation to landscape design elements and subject variables. These studies, as outlined below, have begun to analyze the influence of local scale landscape design elements and subject factors in determining preference for specific landscapes.

2.4.3 Landscape Elements

In discussing specific landscape element preferences, it is important to note that each study used different subject pools, and some were not explicit as to the subject factors. As such, the discussion below is not qualified by subject variables. Instead the results are presented in an unqualified manner as a means of exploring trends and themes. This is considered appropriate because studies have shown (Ode et al. 2007) that landscape elements were a much stronger factor in preference than demographic subject factors.

The inclusion of water has been found to increase landscape preference (Zube, 1973; Yang & Brown, 1992). Yang & Brown (1992) found that this increased preference was especially true for water in a more natural setting, such as water surrounded by dense vegetation, or water that reflected trees and vegetation. Their study also found that the use of rock generated a lower preference in contrast to 'softer' landscape elements. However, if rock was used in relationship with soft elements, preference was increased.

Vegetation has been found to be highly preferred (Yang & Brown, 1992; Purcell & Lamb, 1998; Schroeder, 1982). This is consistent with the overall preference for

nature, as vegetation is a dominant natural feature. Furthermore the form of vegetation (Summit and Sommer, 1999), type and relationship to other elements (Akbar et al., 2003), and density (Bjerke et al., 2006) have been found to impact preference.

Other landscape elements or typologies which have been explored include wetness, roughness and level of cultivation (van den Berg, et al., 1998), level of perceived management (van den Berg & Koole, 2006), and type of management practice (Tahvanainen et al., 2001). A lack of maintenance or unmaintained landscape elements has been shown to decrease preference (Schroeder, 1982; Ward Thompson et al., 2005).

2.4.4 Subject Variability

Previous empirical research on natural environments and specific aspects of natural environments has shown that despite general consensus in the preference for natural landscapes among the public, individual subject factors can influence preference. Some of these factors include levels of familiarity and contact (Dearden, 1984), 'environmental background' (Taps & Savassdisara, 1986), ethnicity (Kaplan & Talbot, 1988), and personal interest in, and interaction with, a landscape (Natori & Chenoweth, 2008). Preference ratings have also been found to vary in relation to ethnic or cultural factors (Lewis, 2006, Kaplan & Herbert, 1987; Kaplan & Talbot, 1988; Eleftheriadis, Tsalikidis & Manos, 1990; Yang & Brown, 1992, Fraser & Kenny, 2000,). Personality, usually defined through psychological testing, has also been shown to influence preference (Abello & Bernaldez, 1986).

Variability has also been found within demographic variables such as age (Lyons, 1983, Balling & Falk, 1982; Bjerke et al., 2006, Tempesta, 2010), and sex (Yabiku, Casagrande & Farley-Metzger, 2008). Van den Berg and Koole (2006) found that age, socio-economic status, farming background and environmentalism were related to individual differences in preference for wilderness developments. However, Dearden (1984) and Surova & Pinto-Correia (2008) found no significant influence of demographic factors, including age, sex, income, education and occupation on subject preference ratings. Age, gender, childhood experience and occupation were also not found to be significant by Brush et al. (2000).

Subject location, most often studied along an urban – rural gradient has also been shown to influence preference (Lyons, 1983; Tips & Savasdisara, 1986; Zheng et al., 2011). Location, in terms of distance, has been shown to influence a subject's perception and knowledge of a landscape (Brody, Highfield & Alston, 2004). Familiarity has also been associated with higher preference ratings (Lyons, 1983; Balling & Falk, 1982; Mugica & De Lucio, 1996, Dearden, 1984), as has place attachment (Kaltenborn & Bjerke, 2002a). Additionally, Ryan (2005) found differences in preference for natural area management practices between those who have place-specific attachment (neighbours and recreational users) and those who have conceptual attachment (volunteers, staff, and those with expert knowledge).

These findings would suggest that a multitude of subject variables may play a role in shaping preference judgments. However, one major review study of environmental aesthetics that included 107 studies, covering 19,000 subjects and 3281

environmental scenes found an overall correlation of preference ($r = .82$) between varying subject types (Stamps III, 1999). The author noted that this was very high and found that exceptions existed only for children, designers, and special interest groups. This research similarly holds that simple demographic factors do not have a strong influence on subject preference ratings, rather preference is influenced to a greater extent by use and value orientations, as is supported by the literature (Surova & Pinto-Correia, 2008; Van den Berg and Koole, 2006; Kaltenborn & Bjerke, 2002b; Bjerke et al., 2006).

2.5 Naturalness in the Visual Landscape

Ode et al. (2007) studied the concept of naturalness in reference to level of succession, number of woodland patches and the shape index of edges. This study found that higher levels of succession and less fragmentation of woodland patches increased preference. Shape index of edges was less conclusive, but generally a low-medium level of complexity had the highest preference score. Through combining the results it was determined that high preference was related to high naturalness and coherence and low preference was related to high stewardship and disturbance. Junker and Buchecker (2008) who, in a study of river restoration schemes, found increased preference for restoration schemes with higher levels of eco-morphology, or morphological form indicating higher ecological integrity. Furthermore, they concluded that there may not be a dichotomy between restoration, public preference and visual assessment of river landscapes. These findings were echoed by Kenwick et al. (2009) in a study of public and professional perceptions of riparian buffers and riparian form.

Purcell and Lamb (1998) found that forested landscapes were seen as more natural than scrub or regenerating landscapes. However, they also found that there is not a clear relationship between perceived naturalness and overt human influence or any particular form of vegetation. The authors concluded that there was the possibility that landscape viewers were able to differentiate between structurally intact and altered forms. As such, this indicated that naturalness might be closely tied to the concept of an ecological aesthetic. Purcell and Lamb held that their results might be a function of tacit knowledge as there was no difference between the assessment of those with specific knowledge and those without.

In terms of this research, previous research on the concept of naturalness as it related to preference seems to indicate some important things. One may be that naturalized parks will be highly preferred because their ecological value is visually exemplified through a lack of disturbance and stewardship. While more formal parks are viewed as also being natural in an urban context naturalized parks were preferred in different and important ways such as holding values related to contact and interaction with nature and benefits such as places of excitement and freedom. (Ozguner and Kendle, 2006). A second important finding is that at the core of this preference may be an ecological aesthetic, wherein explicit and tacit knowledge may inform subject preference. The research on naturalness also indicates that maintained or disturbed landscapes within naturalized parks may have a low preference, as they will be viewed as not fitting with a naturalized park. This is despite the fact that even though they are

maintained or disturbed, they are most likely more ecologically functional than more formal parks.

If Nohl (1999) is right about a shift in the foundation of our modern landscape aesthetic, the concept of naturalness may be one of the ripest areas for future research as its use as an exploratory concept in research will most likely generate strong affective responses from views. Fry et al. (2009) called for a linking of the findings from decades of humanities-based visual landscape research with science-based ecological landscape research. They saw this as the most salient and meaningful way to move forward with visually preferred and ecologically sound landscapes. Through the concept of naturalness the whole may reveal itself as being much greater than the sum of the parts.

2.6 Accessibility in the Visual Landscape

Little work has been completed to date on the visual and affective impacts of incorporating accessible design into predominantly natural landscapes. There is a lack of understanding as to the impacts of accessible design on the visual landscape and the associated level of preference. However, given the review of the social values of naturalized parks outlined in the introduction, providing accessible natural landscapes may be a significant benefit for the physical and emotional health and wellbeing of those with impairments.

Despite limited research on accessible design in natural landscapes, some implications can be inferred from the existing literature reviewed above. One such finding would be that the use of hard surfaces and structures such as benches in

naturalized park will generate lower perceptions of naturalness. The literature indicates that these features would be associated with being man-made and less natural. If preference for natural elements and naturalness is generally consistent, the inclusion of these elements should serve to reduce perceived naturalness and therefore preference.

A previous study of path-trail preferences among those with and those without disabilities found a higher degree of convergence than divergence (Moore, Dattilo & Devine, 1996). It can be extrapolated that in natural landscapes with paths, if both subject groups have similar preferences for path elements, then they may have similar preferences for the visual landscape created as a combination of those elements. It may be that the sum of the parts is not equal to the whole, and the complex visual landscape created through accessible elements in natural landscapes, may generate diverging preference ratings across groups. This may be especially true for the naturalist group of this study, as their natural landscape expectations may be the most incompatible with hard, or man-made accessibility elements. What can be said is that little is known about the visual impact of accessible elements in natural landscapes, especially across different user groups.

One important, but scantily cited, article that explored these implications was the work of Mullick (1993). Mullick outlined the future need, demand, and social necessity of accessible landscapes in American National Parks, and he also asked some important preliminary questions as to the possible ecological and aesthetic impacts. In summarizing his overview, he asked five important questions (1993, p.32):

- 1) Should there be definable limit on human intervention that will maintain the aesthetic integrity of the natural environment?
- 2) Can man-made objects in the natural environment be designed to complement the aesthetics of nature?
- 3) Is there a tolerable limit of human intervention in the natural environment?
- 4) Can the natural environment be made fully accessible, without damaging it permanently?
- 5) What is the minimum level of human intervention that can empower people with disabilities to make independent use of the natural environment?

Mullick's observations and postulations are five succinct and critical questions, which in the intervening decades have been given little attention. This research will explore these questions.

2.7 Use in the Visual Landscape

While a significant body of research has been completed on the assessment of preferred landscapes, and there has been recent interest in the assessment of naturalness, given its linkage to preference, there is far less available in terms of assessments of landscape use. As this research focuses on public parks, assessments of landscape use are considered critically important.

This study assesses subject variables and landscape design variables in determination of preference of predominantly natural landscapes. Accordingly, this research seeks to present a 'refined' exploration of natural landscape preference through focusing on different subject groups and their reaction to different landscape design elements. Additionally, parks, as public places, need to be designed in a way to speak to multiple users who may have very different use and value orientations. Accordingly, there is a need to determine if there are aspects of naturalized park design where there may be greater consensus among a wide spectrum of use and value oriented users.

van den Berg, Vlek and Coeterier (1998) found differences in preference for natural landscape plans between farmers, residents and visitors (cyclists). A similar finding was found by Ryan (1998) between farmers, new residents and long-term residents in terms of preference for riparian landscapes. Rogge et al. (2007) found significant differences in judgments of rural landscapes between farmers, landscape experts and country-dwellers. Similar trends highlighting differences in group evaluations, preferences and appreciations for different landscapes have also been discussed by Surova and Pinto-Correia (2008), Brush et al. (2000), and Egoz et al. (2001)

These differences in landscape preference between groups have been suggested as resulting from differences in landscape motivations and use. van den Berg and Koole (2006) found that recreational motives influenced the type of wilderness development individuals preferred. Additionally, Surova and Pinto-Correia (2008) found differences in the group preferences for landscape types related to patterns of subject-landscape use

and motivations. These findings highlight the important role that subject-landscape interactions, framed within the context of use, value and background, may play in shaping landscape preference. Landscape attributes have also been found to impact use. Bjerke et al. (2006) found that vegetation density influenced perceived appropriateness for recreation, with a moderate density being viewed as most appropriate.

This work takes the approach that difference in landscape use is predominantly due to different subject use or value orientations as outlined above. Use and value orientations generate different perceptions of landscape affordances, or what the landscape offers to the individual based on their needs or motivations. This is somewhat reflective of Gibson's theory of affordances (Gibson, 1979). However, this theory has been interpreted as being objective, or a direct theory of perception, in which meaning is held in the environment and is therefore outside of the interpretive aspect of the perceiver. While some have explored how Gibson's own writings on his theory evolved over time (Jones, 2003), his theory is still generally held to be a direct theory of perception. Others have postulated that affordances in the environment are not exclusively within the environment or within the mind of the perceiver. Chemero (2003) held that affordances are best defined as relations between the environment and the perceiver, and is neither solely direct nor indirect. Therefore, the preference of individuals may vary based on whether or not the person perceives the landscape as offering what they need and this in turn is based on what they want. While the influence of landscape affordances on landscape preference has not been widely

studied, in one primary research project completed by Rourke (2006), perceived affordances did influence subject's rating of landscape preference.

2.8 Design Paradigms

Based on an extensive review of aesthetics, landscape assessment, environmental psychology and landscape preference research outlined above three design paradigms, natural state, visible stewardship and people places have been identified as being possible best practices in naturalized park design. Furthermore, a fourth design paradigm, accessible design, has been included due to its social importance and the relationship between naturalized parks and health and human well-being.

2.8.1 Natural State

The natural state design paradigm is founded in both the scenic and ecological aesthetic. It tends to hold that the appreciation of natural landscapes can be found in the scenic elements of natural systems, and also in tacit and explicit knowledge of those same natural systems. Therefore it would follow that a landscape designed in this manner would be preferred because it taps into both foundations of aesthetic appreciation.

A number of studies have advocated leaving landscapes to take their course with very limited human influence (for example see Gobster, 1994). It is suggested that these landscapes serve the best ecological function as well as creating landscapes that resonate strongly with people.

This design paradigm is implemented through limited landscape disruption. Varying degrees of maintenance can be proposed, such as no touch, or limited maintenance (i.e. only removing invasive species).

2.8.2 Visible Stewardship

This design paradigm is founded in the notion that ‘messy’ ecosystems should be placed in culturally familiar or acceptable frames, and also contain an element of human intention. This idea stems from the work of Nassauer and her theory of ‘cues to care’ (1992; 1995a; 1995b; 2001; 2004). Nassauer’s theory has been interpreted as building upon the ecological aesthetic (Gobster, 1999). The general theory of cues to care is that messy ecosystems require culturally familiar frames and that landscapes which show some element of maintenance and care are more likely to be preferred. This theory is supported by the work of Schroeder (1982) and Ward Thompson et al. (2005) who found that community woodland use was positively related to freedom of rubbish, good information boards and tidiness of appearance. Ozguner & Kendle (2006) also found that while park users wanted parks to be more ‘natural’ they also wanted them to be well looked after – as in ‘neat’ ‘organized’ or ‘managed’.

Furthering Nassauer’s work, Sheppard (2001) developed the theory of visible stewardship. He postulated that “...we find aesthetic those things that clearly show people’s care for and attachment to a particular landscape...we like man-modified landscape that clearly demonstrate respect for nature in a certain place and context” (2001, p. 159). Sheppard noted that this theory departed from that of Nassauer in that it “emphasizes not whether the landscape looks natural, or orderly, or culturally

appropriate, or controlled, so much as whether it looks as though real individuals care for the land or place” (p.159). Specific design elements include the use of fences, interpretive signage, and purposeful maintenance in strategic locations.

2.8.3 People Places

The people places design paradigm is based in evolutionary perspective on the origins of human landscape preference. The design paradigm is primarily based on the Kaplan’s information processing model (1987). Under this model natural landscapes can be designed in a manner to reflect the most salient evolutionary responses to landscapes through combining landscape elements that generate coherence, complexity, legibility and mystery. It would be expected that people would respond favorably to a landscape designed in this manner due to it being a direct response to inherent needs and wants of people in a landscape based on the Kaplan’s research.

The people places design paradigm focuses on designing parks in a purposeful manner to generate people friendly landscapes. Key design elements are used to specifically speak to human cognition. Much of the design elements are outlined in a practice-friendly book, *With People in Mind* (Kaplan, Kaplan and Ryan, 1998). Some of the specific design elements used within the paradigm include: diverging paths, paths that bend around corners, and the use of focal points.

2.8.4 Accessible Landscapes

The accessible design paradigm is not tied to a theory of landscape aesthetics, nor previous preference research. Rather, accessible design is based in a notion of

social equity and is supported by research on restorative environments and human health and wellbeing.

This design paradigm focuses on generating landscapes which can be used by a wide range of users, with an eye to facilitate use by those who may experience accessibility concerns. Two main documents were referenced in the development of the accessible paradigm typology. A primary source was the *Time-Saver Standards for Landscape Architecture* (Harris & Dines, 1998). This reference provided a comprehensive overview of universal design standards for trail networks. A second guide developed in 1994 by Parks Canada entitled *Design Guidelines for Accessible Outdoor Recreation Facilities* also provided standards that are specific to the Canadian context and focuses on parks. Some of the specific design elements used within the paradigm include: wide paths, hard surface paths, and availability of rest stops such as seating and benches and lighting.

2.9 Summary

This chapter opened with a brief discussion of aesthetics. While this research does not seek to further the debate on the foundations of aesthetic experience, an understanding of the different manners in which others have conceived the mechanisms of aesthetic appreciation is important. It is also important to note the fundamental differences in the distinctive conceptions of aesthetics of nature. One, the scenic esthetic, lies outside of the viewer and seeks the archetype or 'perfect' nature. The other, the ecological aesthetic, relies on the viewer as an active participant in relating to the landscape through knowledge or experience. In line with Nohl's (2001) work, there

is no doubt that aesthetics are shifting. On one hand the naivety of the scenic aesthetic resonates with a need for a connection to a simpler time and does support emotional attachment through 'man and nature'. On the other, the wealth of knowledge creation, access to information and the omnipresent human hand mean that deep cognitive connections and an understanding of place can be formed through 'man in nature'. Aesthetics will play an important and underlying roll throughout this research. The way in which aesthetic appreciation is 'created' significantly impacts the manner in which design paradigms are developed and implemented. And as Ozguner et al. (2007) noted much of the 'support for, and revolt against' naturalized landscapes is primarily a matter of aesthetics.

Landscape assessment is a means to assess aesthetics. The objective and subjective approaches to landscape assessment can be considered two distinct paradigms, both with underlying assumptions as to the nature of aesthetic experience. As outlined in Lothian's work (1999), landscape quality assessment can either be objective, based on inherent landscape elements, or subjective, based on human interpretations and meanings. Traditional, expert driven landscape assessments can be generally classified as being objective, whereas preference testing is a subjective exercise. It is important to note that after a full analysis, Lothian (1999, p. 177) assertively held that "only the subjectivist model should be used in research of landscape quality." This argument is supported by existing primary research, such as that of Beza (2010) in a study of the Mt. Everest Trek, wherein both local resident and tourist assessments of landscape were not limited to bio-physical features, but also

included concepts such as wilderness, and emotions such as excitement. Objective approaches can therefore severely limit the value and depth of landscape assessment by excluding the cognitive and affective aspects of human-landscape relationships. In this research the subjective participant driven approach to landscape assessment was selected.

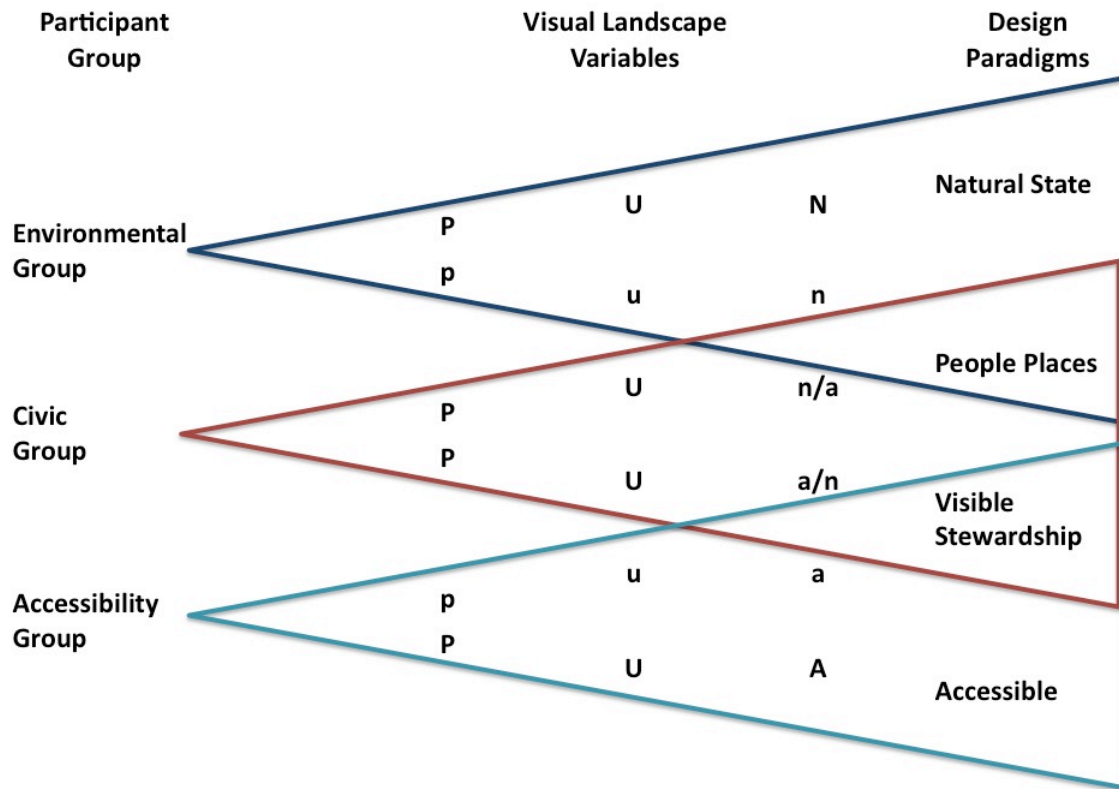
Preference is one of the four selected landscape values that are tested in this research. There is the greatest amount of existing literature on preference. From theory to landscape elements, to subject variables, to values and affordances it becomes clear that while nature is preferred in general, there is a high degree of subject variability for particular forms of nature, landscape types or landscape elements. The literature seems to indicate that there is a strong relationship between the degree of management or human influence in natural landscapes and preference. Landscape elements play a strong role in determinations of preference. The four design paradigms identified and implemented through this study use elements in the landscape as indicators. It is the function of these elements along with the assumed meanings they generate that shapes the landscape experience. Accordingly strong and significantly diverse reactions to the implementation of the design paradigms in the landscape can be expected. Also, key subject variables such as use-orientation and value-orientation may play a significant role in shaping landscape preference. These findings are critically important in the field of naturalized park design as the identified design paradigms used in this research are functionally differentiated in the degree of maintenance and stewardship.

There is far less primary research available on the other three landscape values. Naturalness has been linked to preference in previous studies, but rarely as an independent variable. While increased naturalness may generate increased preference, how is naturalness viewed and assessed in the visual landscape? In the same vein, how is the likelihood to use and physical accessibility determined in the naturalized park visual landscape? While preference is critically important, it is not the only landscape value that is salient to understanding the human-landscape relationship. Additionally, there is no research to date that explores the interface of these landscape values despite their importance and probable overlap.

The overlap of landscape values is explored through the design paradigms. The selected design paradigms are differentiated in their underlying assumptions, but are each held as a possible best practice in the design of naturalized landscapes. This work seeks to determine if one of these design paradigms is truly best given the multiple landscape values under assessment and the use and value orientations of different park users. It may be that across multiple landscape values and users a hybrid design paradigm which takes elements from some or all may be best. The literature would indicate that this is a distinct possibility.

In a final summary, the potential relationships between subject groups, visual landscape variables and design paradigms have been illustrated below in Figure 2.1.

Figure 2.1 – Potential Subject, Visual Landscape Variable and Design Paradigm Relationships



P=strong preference; p=lesser preference, U=strong likelihood to use; u=lesser likelihood to use, A=high accessibility; a=lesser accessibility, N=high naturalness; n=lesser naturalness

Methods

3.1 Theoretical Foundations

Zube, Sell and Taylor (1982; Sell, Taylor & Zube, 1984) undertook a review of landscape perception research with the goal of “identifying the conceptual or theoretical bases” that underlay research focused on determining perceived landscape value. The review drew from multidisciplinary work in the fields of landscape research, geography, forestry, outdoor recreation, environmental studies and behavioral psychology. From this review they developed a model of landscape perception, which conceptualized the process of landscape perception as a function of human-landscape interaction. Zube et al. noted, “the human component encompasses past experience, knowledge, expectations and the socio-cultural context of individuals and groups. The landscape component includes both individual elements and landscapes as entities. The interaction results in outcomes which in turn affect both the human and landscape components.” (1982, p. 3)

Theoretical development followed from reviewing the implicit and explicit theory involved in different landscape perception research directions. The authors noted two major directions in landscape perception research, landscape assessment and landscape meaning, which each contained two theoretical and methodological discourses.

Landscape assessment developed within the fields of environmental management, planning and design and was focused on determining aesthetic quality of a landscape. They identified two major approaches, that of the expert based and the

non-expert-based. The expert based approach utilized fine art theory to determine landscape quality, and the non-expert approach, stimulus-response theory from environmental psychology in conjunction with preference experiments.

Landscape meaning research was primarily concerned with understanding human relationships to landscapes. The first discourse focused on the objective qualities of landscapes or the subjective meaning of landscapes to individuals. This work predominantly was concerned with developing theories of landscape preference and included psychobiological and evolutionary explanations. The second discourse focused on the experience of human-landscape interactions, developing a holistic theory of landscape preference, and utilized phenomenological methodology. Based on the review of the two major directions and each direction's associated discourses in theory and methodology, the authors determined four distinct paradigms, which they termed the *expert*, the *psychophysical*, the *cognitive*, and the *experiential*.

This research will be based in the cognitive paradigm (Zube et al., 1982) of landscape perception research. Taylor et al. (1987, p. 375) outlined the central concept of the cognitive paradigm as, "humans are thinking creatures who do not merely respond to environmental stimuli, but select aspects of the landscape that have value to them." This paradigm stresses the importance of the role of the individual and the cognitive process. As Kroh & Gimblett (1992, p.59) explained, "cognitive research considers the landscape observer as an information processor and landscapes as constructs built up in the mind through visual modes of information gathering." Accordingly, the cognitive approach acknowledges the manner in which human-

landscape interactions are shaped by past experience, knowledge, values, culture, individual meaning and collective social norms. As such, the conceptualization of landscape aesthetics and subsequent preference formation within the cognitive paradigm is a top down, or subject driven approach. The cognitive paradigm will inform the research in its exploration of the relationship between design and management options and aesthetic experience.

The primary methodological approach selected to implement the cognitive paradigm was preference testing. The use of preference testing has been supported as a means to explore the perceptual realm, especially by the general public (Kaplan, 1985). It is a key tool in exploring subtle differentiations that inform preference via perception. Additionally, three other concepts beyond preference were selected and tested in a similar fashion. These included naturalness, accessibility and use. These four concepts were selected as they related specifically to the research at hand given it was a study of best design practices (preference), including accessible design (accessibility), in a naturalized (naturalness) public park (use) setting. It was felt that these concepts would allow for the exploration of the interrelated components of a cognitive assessment of the research landscapes in a manner that was grounded enough to inform planning decisions.

3.2 Overview and Mixed Methods Approach

This research was based in environmental psychology and combined a background questionnaire to gather subject demographic information, a rating exercise, and a pile sorting exercise in conjunction with a semi-structured interview. The initial

stage involved the development of computer-generated visualizations. These visualizations were used in the rating, pile sorting and interview stages of the research to test participant assessments of preference, naturalness, accessibility and likelihood of use (or 'use') for each design paradigm. Secondly, the visualizations were pile sorted by the subjects and used as stimuli for a semi structured interview. Again the interviews explored the concepts of preference, naturalness, use and accessibility. Accordingly, this research utilized a mixed method approach, where quantitative data were generated from subject ratings and qualitative data were generated from pile sorts and subject interviews.

The mixed methods approach was specifically selected to support robust research findings. Schroeder (1991) in a study of arboretum landscapes, found that quantitative data from a rating exercise in combination with qualitative data from open-ended responses yielded a more complete set of results. The use of quantitative methods aided in assessing the preference aspects of the research, while qualitative methods aided in understanding an individual's preference for the design treatments, and how an individual's use and value orientations influenced preference. The interviews shed light on the cognitive process and affective responses to the landscapes presented and Kroh & Gimblett (1992, p.68) found that beyond significance at a theoretical level, verbal responses "contribute dynamic contextual information which may be used to define important elements of preference."

The rationale for selecting a mixed method approach was that the information generated through qualitative methods would support and expand analysis of the

quantitative data. Furthermore, the qualitative data would assist in theoretical exploration which providing context and insight to judgments of preference, naturalness, accessibility and use. Essentially the mixed method approach allowed for an understanding of both what is preferred and why it was preferred. These data would assist in furthering the existing body of literature. Additionally, the qualitative data were useful in the exploration of specific design elements outside of the broader paradigm that could indicate areas of consensus and therefore cross paradigm best practices. This information was useful in providing insight to the professional aspects of planning and design.

3.3 The Use of Visualizations in Landscape Assessment

The use of visualization technology has grown significantly over the past three decades with advancements in computer and software technology. Visualizations are predominantly used in exploratory exercises. The use of visualizations allows for the exploration of the impacts of proposed development and design prior to landscape change taking place. As demonstrated in this work, visualizations also allow for multiple development and design possibilities to be compared side by side. This method allows for greater understanding of both what people prefer and why. As Tahvanainen et al. (2001) found, the use of visual presentations in landscape preference research is a much more robust method than relating landscape preference judgments to verbal descriptions of landscape alterations. Their study indicated that providing subjects with a depiction of the landscape treatment allowed them to more appropriately judge their preference for landscape alternation practices such as clearing and thinning.

One important methodological aspect of the use of visualizations is realism and response equivalence to the real world landscape. Photographs have been shown to be good representations of the actual visual environment for exploring judgments of that visual environment (Stewart et al., 1984). This study used photorealistic visualizations. Based on the work of Daniel and Meitner (2001), high-resolution, full colour non-abstracted (high realism) visualizations have been shown to have the highest validity as stimuli for exploring scenic beauty ratings. While the use of highly realistic photographic visual stimulus has been found to generate better response equivalence with the actual landscapes they seek to depict, Wergles and Muhar (2009) found that visualizations are limited in their ability to communicate aspects such as texture, interaction, sensory qualities and movement. However the level of realism and representativeness of the visualizations used in that study could be called into question and is acknowledged by the authors. Kroh and Gimblett (1992) found that multi-sensory variables found in real world landscapes impact preference. Benfield et al. (2010) noted that preference research that only uses in-laboratory testing must acknowledge the impact this may have on the results. Accordingly, this research does not seek to provide definitive answers as to the best design paradigm that should be adopted. Rather it seeks to inform the current research and provide an indication of future directions as well as open the door to the currently unstudied concept of accessible design in naturalized parks. This is why only physical accessibility was reviewed under this scenario. This research recognizes that other, more cognitive based accessibility concerns, such as

designing for those with dementia, should include auditory cues as well as others to provide a holistic landscape assessment.

An additional concern raised with the use of visualizations is that it is difficult to assess ecological processes in a static format. From a research standpoint, the validity of methods to simulate ecological processes in a landscape that are not static and may occur over timeframes that well exceed those of a human lifetime has been questioned (Sheppard, 2001; Daniel, 2001). The question has also been asked as to how best to represent a dynamic ecosystem in research (Daniel, 2001), especially when portions of the system may not be perceptible (Nassauer, 1992). Again, these limitations of visualizations must be acknowledged.

One important supporting aspect of the use of visualizations is that it allows the research participant to specifically rate the landscape in terms of the design treatment. The use of visualizations in this study allowed for a consistent basis on which to compare the design paradigms. Through the use of visualizations a representative world was created in which the only factors changed were those directly related to the design treatments. Accordingly, the responses of the research participants will be only impacted by the design paradigms. This provides more robust results than could be achieved through a photo questionnaire of real world sites that typified the different design paradigms. While static images removed from the actual landscape do have their limitations, their use is an effective manner in which to compare specific design treatments using a common landscape. Static images and in-laboratory testing allow for control of the landscape variables. This control is expected to produce a much clearer

and comprehensible set of results. Accordingly, the results will generate a more robust foundation for conclusions.

The use of computer-generated visualizations in preference testing has been used in other studies including Ode et al. (2007). This research adopted a somewhat similar methodology to that used by Ode et al. in a study of naturalness. This research sought a balance between the data-driven visualization directives (Bergen, McGaughey & Fridley, 1998) and the more interpretive or artistic techniques. To further support accuracy and realism in the visualizations and to support replicable results, the best practices as laid out in Sheppard's (2001) seminal work on visualization preparation were used. Additionally, the core simulation principles of representative, accurate, credible, comprehensible and bias-free (Sheppard, 1986) were adhered to. The 'Practical Guidelines' for the development, preparation and use simulations by Sheppard (1989) were a constant reference tool.

The use of visualizations in research requires both a consistent approach and a creative hand. It is important that the person charged with the preparation of the visualizations generate fair representations of the actual development and design outcomes. Accordingly, a number of site inspections were made to the actual park landscape. During the site visits reference photographs were taken, the vegetation was inventoried and mapped, and time was spent to develop a consistent 'sense of place'. All of these elements were used by the researcher to support a consistent approach to the creative process of visualization development.

While studies have shown that static visualizations may be lacking in providing robust surrogates to real world experience and ecological process they do allow for the testing of multiple design scenarios on a constant backdrop. This positive feature far outweighs the identified shortfalls. Acknowledging the limits of visualizations is important, but they provide for significant benefits to this type of research by allowing for alteration of the landscape in a very controlled and precise manner. That is why the use of visualizations was specifically selected for this research.

3.4 Research setting and site selection

The visualizations were based on a real world site. Hillside Park in Waterloo Ontario was selected as it 1) was conveniently located; 2) typified the fundamental aspects of naturalized parks; and 3) contained the necessary variety of sub-landscape types within a single park area. Three preliminary site inspections were made to the park. Based on the park visits, three distinct naturalized park sub-landscapes were selected. These landscapes can be defined as 'open', 'enclosed path' and 'riparian'. Particular viewsheds were also selected as representative of important views within the park (Sheppard, 1989). During site visits numerous photographs of the park were taken. These photographs were to be later used as guides for visualization development. Additionally the vegetation communities were inventoried and mapped. The site inventory and assessment of vegetation communities would be used later during the development of colour maps. This allowed for a representative landscape to be generated that reflected the real world vegetation communities, vegetation densities and vegetation structures.

3.5 Implementing the Design Paradigms

As noted in the introduction, a comprehensive overview of the fields of landscape research, environmental psychology, landscape architecture, environmental aesthetics and urban planning and design was undertaken. A number of design paradigms for natural state landscapes and parks were discerned. One of the greatest difficulties in implementing the identified design paradigms was that generally no specific guides to implementation have been written. However, each paradigm generally had an individual or group of individuals as champions and the related research revealed sufficient examples of their theory in practice to provide some guidance on implementing the design paradigm. Accordingly, before the visualizations were prepared, a table was developed of the theory, practice (design elements), and sources for each design paradigm. The table was circulated to a professor and Master's candidate within the School of Planning at the University of Waterloo who are familiar with this research area and body of literature. Their comments assisted in selecting the specific combination of design elements that were used to typify the naturalized landscape design paradigm when theory was put into practice through the visualization generation. The final table has been recreated below (see Table 3.1).

Table 3.1 Design Paradigms in Practice

Paradigm	Selected Design Elements	Sources
Natural State Ecological aesthetic; minimal disruption; limited indication of human intent; ecological integrity	<ul style="list-style-type: none"> • Limited indication of use • Basic foot paths • Similar conditions to Hill Side Park 	Hill Side Park Gobster (1995) Gobster (1999)
Visible Stewardship Visible care and stewardship; messy ecosystems in orderly frames; culturally accepted frames	<ul style="list-style-type: none"> • Mown path edges • Fences 	Gobster (1994) Hands & Brown (2002) Mozingo (1997) Nassauer (1992) Nassauer (1995a) Nassauer (1995b) Nassauer (2004)
People Places Coherence, complexity, mystery, legibility; design based on preferred landscape elements	<ul style="list-style-type: none"> • Diverging/wandering paths • Focal/reference points or features 	Kaplan, Kaplan & Ryan (1998)
Accessible Landscape Universal design; social justice; social imperative	<ul style="list-style-type: none"> • Wide paths • Hardened path surfaces • Benches (rest stops) and Lighting 	Harris & Dines (1998) Parks Canada Services & Canadian Paraplegic Association (1994)

3.6 Visualization Development

The preliminary step in the visualization development was accessing the geo-spatial information. This information was gathered from the Regional Municipality of Waterloo database available through the University of Waterloo. The information was then imported into ArcGIS and trimmed and exported as a digital elevation model (DEM). The DEM file was then imported into Visual Nature Studio (VNS) and constituted

the foundation of the park landscape. Atmospheric conditions were established, such as sun intensity and haze.

Next, VNS cameras were placed in the location of the viewer for each sub-landscape. Each camera was calibrated to be 5'8" off the ground and have a 50-degree field of view (Sheppard, 1989). Accordingly, the camera placement and resulting outputs were consistent with what would be viewable by a person of average height. This supports realism by providing for a viewshed that is achievable in the real world.

A colour map was generated in Adobe Photoshop 7. A colour map is a two dimensional representation of the vegetation communities as represented by distinct colours with a specific RGB value. Each vegetation community found in the real-world park landscape was represented on the colour map. In total 18 vegetation communities were identified and therefore 18 distinct colours were used and mapped. Again, the location and boundary of each vegetation community was determined through on site inventories of Hillside Park and through the use of aerial photography. On site inventories were also used to determine vegetation community compositions and densities. The completed colour map was subsequently imported to VNS and draped over the DEM, thus creating a three dimensional spatially accurate representation of Hillside Park. The final colour map can be found in Appendix A.

Paths and watercourses were then added using the vector tool in VNS. They were plotted in the virtual environment based on aerial photography, and knowledge gained from the site inspections where vegetation obscured the path location in the available aerial photography. The path and watercourse widths were set, and the

watercourse was given a concave contour and a water texture. The parameters of the water texture were altered through a trial and error process until a high level of realism was achieved which was also reflective of the real world condition. The path vectors were given a generic texture that was to be modified at a later point through editing in Adobe Photoshop 7. This method was used, as the built-in VNS texturing process did not satisfy the required elements of path texture diversity and realism.

The next step was the population of the park landscape vegetation. To achieve this, billboards were used. Billboards are two-dimensional photographs of individual plant or trees species. The majority of the billboards used were available in the VNS library. Some of the VNS billboards were exported and modified in Adobe Photoshop and then re-imported to the VNS library to provide for an increased element of billboard diversity and therefore final visual landscape diversity. Elements such a trunk length and bark texture were modified. This was especially important for the 'path' sub-landscape where mature vegetation was in close proximity to the viewer. Throughout the landscape population process, the cameras that were placed on the landscape were used to preview the resulting visual landscapes. Using the site photographs as a reference, aspects of the visual landscape were adjusted using the 'rules' of VNS (such as vegetation density in relation to slope) and by altering the type, density and form of both the understory and overstory of each vegetation community. Based on these established rules and settings VNS randomly populated the landscape using the supplied parameters.

Once the base, or natural state sub-landscapes were complete, the next step in the process was that each sub-landscape was modified to represent each of the design paradigms. To do this a copy of the natural state VNS file was made and then the copied file was modified to represent the design paradigm. This was repeated three times for each of the additional design paradigms. This ensured a consistent base upon which the design paradigm was developed.

This design paradigm development involved the placement of features, the narrowing, widening and/or altering of paths, the altering of vegetation communities, and the altering of ground textures. For example, to achieve the accessible landscape, the path vectors were widened and three dimensional objects from the Google 3D Warehouse were sourced, altered in Google SketchUp and then imported into VNS and placed using point location data. These objects included the benches and the light standards. The objects, once imported and placed needed to be correctly oriented in relation to the newly widened paths. A hardened asphalt path surface was later added during the photo editing process using Adobe Photoshop 7. Once each design treatment had been completed for each sub-landscape, final elements such as shadowing, atmosphere and sky conditions were added.

Landscape renderings, or photographs, for each sub-landscape type and each design treatment were taken in VNS. Three sequential renderings were taken at 50 degree intervals, the first head-on and two additional shots, one to the left and one to the right. The resulting rendering sets were stitched together in Adobe Photoshop 7 using the auto-stitch function. This generated panoramic composite visualizations for

each landscape and for each design treatment. The 12 final photographs can be viewed in a reduced form in Appendix B.

These composite outputs were then imported into Adobe Photoshop 7 and modified further. Path textures were added, and minor details were modified to increase the realism of the renderings. This included increasing the layering of background vegetation and blending any visible seams left over from the stitching exercise. Shadowing within the images was also touched-up.

The resulting set of visualizations were printed as 38cm by 12.5 cm photographs on FUJIFILM Fujicolor Crystal Archive Paper. The printing of the photographs was completed at a commercial photo finishing centre. Two identical sets of the images were produced. As the images were to be handled by many subjects they were laminated to provide an element of durability that did not diminish the photographic quality of the visualizations.

3.7 Questionnaire Development

Part 1 of the questionnaire was developed to provide some basic demographic information. The primary information included was the key subject variables that were salient to this study. This information included age range, gender, frequency of park use, urban or rural residency, and people-nature values in relation to parks. Additionally, the participants were asked to self-identify according to specific characteristics which were used to categorize the participants into the three primary subject groups; those who face accessibility concerns in public places, those who are civically engaged around park issues, and those who belong to nature, ecology or environmental organizations. In two instances a participant self identified with more than one group. It was made clear to the participant that they were to be interviewed as a member of one group or the other. Generally, it was found that their responses did correspond primarily to one group, and they were accordingly classified with that group. A similar approach was used by Surova & Pinto-Correia (2008). Particular attention was paid during coding to ensure interview statements used were reflective of a single disposition.

Part two of the questionnaire was used in conjunction with the set of 12 landscape visualizations. The participants were asked to rate each landscape image based on their judgments of preference, naturalness, use, and movement. The participants recorded their responses on a 5 point Likert scale, which is a standard practice in preference testing studies. For clarity and simplicity of use, each set of rating scales was given on its own page for each image numbered 1-12. An example of

the wording used is provided below. Simple semantic differentials were used to facilitate participant response.

Preference: How much you like the landscape?

1 = Do not like at all

5 = Like very much

Naturalness: How natural you think the landscape is?

1= Not natural

5= Completely natural

Use: How likely you would be to use the landscape?

1= Would not use

5= Would use often

Movement: How well could you move through the landscape?

1= Could not move through the landscape at all

5= Could easily move through the landscape

3.8 Sampling

This research utilizes a nonprobabilistic sample, selected through a mixed purposive/snowball sampling method. This sampling method was selected based on the resources available to complete the research. Additionally, referrals through the snowballing sampling method provided participants who were keen to share their thoughts and insight. The research sought key subjects who broadly self-identified as naturalist, those civically engaged in parks and those who face accessibility concerns. A similar purposeful sampling approach was used in a study by Rogge et al. (2007).

As noted in the literature review, it is important to control for subject variables that have been shown to influence preference. Based on this significant review of the existing research on landscape preference, this study holds that use and value based variables may strongly impact preference. However, this research, rather than avoid

these variables, specifically sought out subjects who were assumed to hold different use and value orientations. In so doing it was assumed that it would provide for the most robust exploration of the design paradigms. Given the limited sample size of the research project this purposive sampling method would elicit participants that would have the strongest affective responses to the different design paradigms. Accordingly the results are not representative of a wider population. However they do strongly indicate the degree and mechanisms behind use and value orientation and how this shapes landscape assessment.

Members of civic organizations were sourced through listings of members of park committees or local beautification committees. These listings were openly available to the public on the local municipal website. Naturalists were contacted through local environmental organizations. These organizations were contacted, and given an overview of the research. If the heads of the organizations agreed, they were asked to circulate a request for participation amongst their membership. Most accessible participants were found through referrals and snowball sampling. One primary contact was the Manager of the local Parks and Recreation Department. There was a limited opportunity to contact organizations, as there were no independent living type organizations in the region used for the study.

Cultural differences are considered to be a significant factor in differing landscape assessments. Cultural differences are not a key aspect of this research. It is assumed that for the most part subjects who participated identified with a generally similar cultural background, however given the public nature of parks the minor

influence of different cultural elements was considered to be reflective of real world users, and assistive in furthering the generalizability of the results. As an indication of the scope of two cultural differences collected through the questionnaire, see the tables below related to frequency of park use and urban or rural residency. There was a balance in terms of both park use frequency and urban/rural residency.

Table 3.2 Park use Frequency (May-October)

Multiple times each day	1
Daily	0
2-4 times per week	3
Once a week	5
Once every few weeks	4
Once a month	1
Once every few months	0
Never	1

Table 3.3 Park Use Frequency (November-April)

Multiple times each day	1
Daily	0
2-4 times per week	3
Once a week	1
Once every few weeks	3
Once a month	2
Once every few months	3
Never	2

Table 3.4 Residency

Residency	Urban	Rural
0%	3	3
25%	5	4
50%	0	0
75%	4	5
100%	3	3

While there is debate as to the significance of simple demographic factors, this research holds that they are secondary to subject use and values orientations. To some extent age has been eliminated as a factor as no subjects are included who are under eighteen years of age. Previous studies have shown that within age determinants the young/old dichotomy most strongly influences preference judgments (Balling & Falk, 1982). The age structure of participants (see Table 3.5) was generally balanced with a slight over-reporting by those aged 18-28 and 29-30, given the population structure of Canada. The gender of participants was heavily skewed towards female respondents (see Table 3.6).

Table 3.5 Age Structure of Participants

18-28	3
29-38	2
39-48	1
49-58	5
59-68	2
69-78	1
79-88	1
89+	0

Table 3.6 Gender Structure of Participants

Male	3
Female	12

3.9 Data Collection Procedures

The process of stimulus delivery was standardized across all research participants. The photographic stimuli were randomly ordered based on an on-line randomizer. One set of images was numbered on the back to allow for consistency in their presentation to participants by the researcher. The other set was given the same numbers, however they were innocuously numbered on a front corner of the image. These numbers were then used during the pile sort exercise and interviewing for ease of referencing by both the participant and the researcher.

The images were presented to the participants at a comfortable distance and at a 45 degree viewing angle (Sheppard, 1989). Some participants wished to view the images at a closer range than others. It was left to the participant to find a comfortable viewing range instead of requiring a single and specified viewing distance. This was done to avoid subject fatigue and discomfort. The distance between viewer and the images was generally 0.5m, which is consistent with the standard outlined by Sheppard (1989) for images of the size used. This allowed for the landscape to be viewed as a complete image and provide some element of emersion in the depicted landscape.

The participants were given specific instructions about the period of time in which to review the visualizations and to move through the rating exercise. Given that the rating was to be based on a visceral affective response to the depicted landscape, the review period was limited to 8 seconds. After the initial review period, the participants were allowed to visually reference the images while completing the rating exercise. This was generally limited to a glance for a period of less than 2 seconds. The

researcher handled the photographs during this exercise and rotated through the ordered set while holding the images in front of the participant.

3.10 Pre-testing

The questionnaire, rating exercise, stimulus delivery methodology, and semi-structured interview were pretested with three individuals who were considered to be representative of the anticipated respondents. The feedback that was received from the pre-testers was used to slightly modify the research methodology. No changes occurred to the questionnaire, rating exercise, stimulus delivery or interview process. Rather the pre-testing indicated that the instructions given by the interviewer were generally good, however a number of statements of clarification were required. Accordingly the preambles were slightly lengthened and the instructions were simplified. This caused for a reduction in the overall number of statements of clarification required. The development of the 'interviewer script' continued through the pre-testing and was considered fully formed by the end of the third pre-test subject.

3.11 Data Collection

Each rating exercise, pile sort and semi structured interview was performed in person by the researcher. Completion of the research by one individual allowed for consistency in delivery and interview probing. An overview of the project was given and the outline of the rating, sorting and interview process was provided. Instruction was provided throughout the process as each stage commenced. The participants completed questionnaires and recorded ratings on a pre-developed survey and rating scale. The results of the sorting exercise were recorded by the researcher. An active

role, using a similar approach, was taken in the interviews. The interviews were recorded with participant permission and transcribed verbatim at a later date. This allowed for the researcher's active attention in the discussion and the interview process to proceed in an expedient manner.

3.11.1 Rating Exercise

The rating exercise began with an explanation of the variables being rated. Following this the participants were briefed on how to complete the ratings on paper, and the manner in which the images were going to be presented. Instructions were also given as to the timeframe for review and rating of the images. Any outstanding questions or points of clarification were answered, generally using the same information that had just been provided, but with a greater degree of detail or rephrased in a different manner. The first step was a preview of the photographs. The entire set of 12 photographs was scrolled through by the researcher while the participant observed. The participant viewed each photograph for approximately 1 second. This preview was used to ensure that the participant had an understanding of the full range of images that would be presented to them. A similar methodology was used effectively by Gregory and Davis (1993) in a study of woodland riverscapes. This tactic ensured that the ratings would be consistent across the entire range of landscape types and design paradigms.

The second stage involved the rating of each image using the supplied questionnaire with a Likert scale for each variable. As noted above the participants were instructed to review each image for a maximum of 8 seconds and then proceed

with the rating exercise. Each image took approximately 20 to 30 seconds to rate for all five variables. Therefore, the rating exercise with preamble and instructions took approximately 8-10 minutes to complete.

This exercise resulted in a numeric value for each design paradigm as expressed in each sub-landscape for each participant. Therefore, given five variables and 12 photographs, each participant provided 60 individual ratings.

3.11.2 Semi-Structured Interviews

The semi-structured interviews used a constrained pile sort (Q-sort) exercise as a launching point. Pile sorting exercises are used to provide insight into participant's judgments of similarities (Boster, 1994) and it was felt this was a good manner in which to break the ice and provide a basis for discussion. The sorting exercise took the form of a non-forced distribution; wherein participants were limited to sorting into three piles, however, no specific number of photographs was dictated to be placed in any of the three piles. The pile sorting exercise was completed four times by each participant, with each individual exercise being based on one of the four core variables: preference, naturalness, use and accessibility. The three piles represented a high, neutral and low rating. Constrained pile sorts were used as they are held to provide a manageable set of results. Additionally, as the parameters for sorting were given and based on the core concepts being explored, a constrained sorting exercise was considered more appropriate. This exercise was used as the foundation for the primary research stage, the semi-structured interviews.

After each pile sorting exercise, semi structured interviews were used to gain better insight into the reasoning behind participant's determination of preference, naturalness, their likelihood of use, and their ability to move through the landscape. These were considered to be the core aspects of the research as these variables specifically address the identified design paradigms and overall landscape preference. The participants were asked to explain their sorting decisions and were asked follow-up questions that explored the responses given.

A total of 15 interviews were completed. This number reflects five participants from each identified subject group. While there is limited research on the concept of data saturation in nonprobabilistic purposive samples, it has been found that saturation occurs within the first 12 interviews and foundational elements of meta-themes are apparent within the first 6 interviews (Guest, Bunce & Johnson, 2006). The researcher found these findings to be consistent with the results of this study's interview process. Elements of meta-themes were apparent after a very small number of interviews and theoretical saturation was reached by interview number 10 (i.e. the same themes were being consistently cited by the participants).

3.12 Data Analysis

Given the limited sample size, the data generated from the rating exercise and were presented as descriptive statistics. The interviews were transcribed and coded and themed using a directed content analysis approach.

3.12.1 Rating Analysis

Each participant generated a set of 60 rating responses. These ratings were tabled and analyzed across the visual landscape variables. The results were presented as mean ratings and were tied to the visualizations and qualitative data to explore themes and trends. The results were broken down to show the mean ratings of each of the 12 images by group type and for all participants. The rankings were used to assess trends. Non-parametric statistical analysis, specifically Spearman's rank correlation coefficient, was used to further explore similarities and differences across groups. The commercial statistical package SPSS was used and Field (2005) was used as a guide.

3.12.2 Interview Analysis

The data were derived from in-depth interviews using semi-structured questionnaire. A directed approach to content analysis (Hsieh & Shannon, 2005) was used. Unlike conventional content analysis where coding categories are derived directly from the text data, the directed approach uses a theory or relevant research findings as guidance for initial codes.

This research used the research of Tveit et al. (2006) as the starting point (see Table 3.8) for the directed content analysis approach. Tveit et al.'s research represents a robust summary of the complex field of visual landscape character assessment with over 150 references to primary research to support the concept and framework development. A table of the concept, adapted from the original paper, is provided below. The core concepts and frames are outlined in conjunction with definitions of the concept and examples of landscape elements that typify the concept. The nine concepts

which Tveit et al. identified provide a thorough synthesis of the frames used in visual landscape assessment. The concepts include: stewardship, coherence, disturbance, historicity, visual scale, imageability, complexity, naturalness and ephemera. It is expected that these concepts will be themes that run through the participants' exploration and responses to the landscapes presented in this research. The concepts therefore provide a means to ground the exploration of the particular landscape assessments made by the research participants.

It was felt that consistency in the linguistics and frames used to analyze the results of this research would allow for its ease in integration into the current body of research and future studies. As such, directed content analysis allowed for this research to inform the existing body and assisted in clarifying existing findings and setting out new research questions for future studies. As Hsieh & Shannon (2005, p.1281) suggest, "The goal of a directed approach to content analysis is to validate or extend conceptually a theoretical framework or theory." Any data that did not fit or could not be coded using the selected theory was noted for later discussion, as this data could represent a new concept of the visual landscape not discussed by Tveit et al. (2006).

The interviews were transcribed verbatim from audio recordings that were taken at the time of the interview. The transcripts were completed in a manner consistent with the guidelines offered by McLellan, MacQueen and Neidig (2003). All transcripts were read from start to finish. The transcripts were then re-read and comments were highlighted which fit with the concepts of Tveit et al., with each concept having its own colour code. It was found that all comments related to the visual landscape fit within

Tveit et al.'s concept framework. All colour-coded statements were re-written as a group, with each statement being given a number to indicate its origin (group/participant). These statements were further analyzed to determine themes. Coding was used to achieve this. Triangulation of identified themes was utilized to ensure the findings generated were robust and representative of multiple landscape interpretations. Other comments that were not triangulated were also recoded as they were thought to still indicate future directions for research. The themes were used to draw linkages between the groups and the design paradigms. Design elements that participants identified in their statements were also recorded in relation to the themes, and provided with a positive or negative attribute. These results were graphically charted and particular attention was paid to concept overlap and according areas of consensus across groups. An example of the concept, code, theme, element analysis is provided below in Table 3.7.

One limitation of directed approach which must be made clear is that it contains a bias given it is using existing research and concepts as a tool for analysis. However, given the extensive literature review by Tveit et al. (2006), the associated concepts and framework are considered to be well founded and representative of the field to date. Furthermore, the concepts explored by Tveit et al. (2006) do not suggest a positive or negative connotation; rather they act as a cognitive framework for the perceptual process of landscape assessment. Accordingly, these concepts and the associated framework are considered to be a robust tool that can be used to explore an individual's experience of the environment.

Table 3.7 Selective Schema of Content Analysis

Concept	Codes	Theme	Element
Naturalness	Man-made Placed Out of place City Park	Presence	Gazebo (-) Path (-) Lights (-)
Coherence/Disturbance	Contrived More Natural Material Intentional	Fit	Fences (+/-, neutral) Benches (-) Light (-)
Naturalness	Untouched Wild Ecology	Presence	Water (+) Mature Trees (+) Scrub Trees (-)
Naturalness	Intention Natural Low impact	Form	Winding Path (+) Straight Path (-)
Imageability	Exciting Interesting Neat	Excitement/Interest	Rock Feature (+) Water (+) Diverging Path (+) Open area (-) Straight Paths (-)
Stewardship	Supposed to be there Maintained Kept	Comfort/Safety	Fence (+) Built Path (+) Narrow/ Winding Path (-)

3.13 Reliability and Validity

Internal reliability was supported in this research through a number of mechanisms. The use of directed content analysis using the clearly defined concepts of Tveit et al. (2006) provided for an element of coding reliability. Secondly, the research design that used both quantitative rating exercises and qualitative interviews allowed for the comparison of results. A five point scale (response category) was selected as it has been shown to balance reliability and subject ease of use (Preston & Colman, 2000). The results indicate a strong consensus between the rating results and the verbal landscape assessments provided by the participants. The qualitative results are also considered reliable in that they in that they are considered to be applicable and transferable (Golafshani, 2003)

To support external reliability, the process of visualization development, from site selection to participant engagement was completed using the principles and guidance provided by Sheppard (1989). The visualizations were developed in a manner as to exclude specific geographical features that might have biased subject responses. Furthermore, during testing, the landscapes were introduced as a hypothetical naturalized park landscape, and not limited in reference to their location or size. As such, each subject was allowed to form their own mental image of the naturalized park as a whole beyond the segmented parts represented in the visualization. This method was similarly used by Ode et al. (2007). The ground truthing, documentation and process used in development through testing of the visualizations assists in furthering a replicable set of results.

Validity is understood as the degree to which the methods and measures used relate to the concept or questions under study. Rating exercises using a Likert scale are a standard practice in landscape assessment and other psychological studies. Furthermore, pretesting was used to ensure that the research questions had been operationalized in a clear and understandable manner and the data sets generated were reflective of the questions and concepts being probed. Furthermore, in a similar fashion to reliability, the congruence of what was rated and what was verbalized is an indication of quality and trustworthiness of the research (Golafshani, 2003). The process of triangulation was also used to support the validity of the research findings. Additionally, the results of the study correspond to previous empirical research in the field.

Table 3.8 Concepts and Framework (from Tveit et al. 2006)

Concept	Dimension	Landscape Attributes	Potential Indicators
Stewardship presence of a sense of order and care, contributing to a perceived accordance to an 'ideal' situation. Stewardship reflects human care for the landscape through active and careful management.	sense of order; sense of care; upkeep.	signs of use/non-use; vegetation succession; buildings, linear features (fences, paths etc.) management detail; drainage; waste.	percentage of abandoned land and stage of succession; status of maintenance of buildings; management type and frequency; length and condition of linear features (for example fences and walls); presence of waste; wet areas in crop fields; presence of weed.
Coherence a reflection of the unity of a scene, where coherence may be enhanced through repeating patterns of colour and texture. Coherence is also a reflection of the correspondence between land use and natural conditions in an area.	harmony; unity/holistic ; land-use suitability.	land use; water; pattern.	percentage land use in correspondence with natural conditions; water presence and its spatial location; repeating colours and patterns.
Disturbance lack of contextual fit and coherence, where elements deviate from the context. Disturbance is related to constructions and interventions occurring in the landscape, of both temporary and permanent character.	lack of contextual fit; lack of coherence.	extraction; natural disturbance (for example: fire and windfall); constructions (for example: motorway; infrastructure; urban elements; temporary constructions).	number of disturbing elements; percentage area impacted by disturbance, visibility of disturbing elements.
Historicity as determined by two dimensions, historical continuity and historical	historical continuity; historical	visible time layers; cultural elements (for example, historical	presence of cultural elements; shape and type of linear historical elements; age of historical elements; number of time layers;

richness. Historical continuity reflects the visual presence of different time layers, also influenced by the age of the layers, while historical richness relates to the amount, condition and diversity of cultural elements.	richness.	agricultural buildings, grave mounds, ruins, cairns, signs of earlier cultivation, fences, stone walls, historical roads and paths); traditional agricultural structures.	percentage area of historic continuity; presence of traditional land use and pattern.
Visual Scale the perceptual units that reflect the experience of landscape rooms, visibility and openness.	visibility; openness; grain size.	topography; vegetation; man made obstacle.	viewshed size; viewshed form; depth of view; degree of openness; grain size; number of obstructing objects.
Imageability as qualities of a landscape present in totality or through elements; landmarks and special features, both natural and cultural, making the landscape create a strong visual image in the observer, and making landscapes distinguishable and memorable.	spirit of place; genius loci; uniqueness/d distinctiveness ; vividness.	spectacular elements; panorama; landmarks; water; iconic elements.	viewpoints; presence of spectacular, unique or iconic elements and landmarks; presence of historic elements and patterns, presence of water bodies, percentage area of moving water.
Complexity as the diversity and richness of landscape elements and features, their interspersion as well as the grain size of the landscape.	diversity; variation; complexity of patterns and shapes.	linear features; point features; land cover; land form.	number of objects and types; evenness index; dominance index; diversity indices; shape diversity; size variation indices; heterogeneity indices; edge density; aggregation indices.
Naturalness as closeness to a preconceived natural state.	intactness; wilderness; natural; ecologically	natural feature; structural integrity of vegetation; vegetation/land-cover type; water; management; patch	fractal dimension; vegetation intactness; percentage area with permanent vegetation cover; presence of water; percentage area water; presence of natural feature; lack of

	robust.	shape; edge shape.	management; management intensity (type and frequency), naturalism index, degree of wilderness.
Ephemera as elements and land-cover types changing with season and weather.	seasonal change (human imposed and natural); weather related changes.	land cover/vegetation; animals; land use (ploughing, etc.); water (colour reflections and waves); weather.	percentage of land cover with seasonal change; presence of animals; presence of cyclical farming activities; percentage area water; projected and reflected images; presence of weather characteristics.

Results

4.1 Introduction

At the outset of this paper, four research questions were stated. The results provide direct insight into the first two of these questions. The results have been structured so to address each question as ordered. The research questions included:

- 1) What are the relationships between the four design paradigms a) natural state, b) people places, c) visible stewardship, and d) physical accessibility and the four landscape values a) preference; b) naturalness; c) accessibility; and d) use?**

- 2) What are the similarities and differences in landscape value judgments for different groups for naturalized park landscape designs?**

The results are divided into six sections. The first four sections outline the ratings and interview results related to the four design paradigms and the four landscape variables, or landscape values, under consideration: preference, naturalness, accessibility and use. Each section provides a graphical overview of the design paradigm rankings for each landscape value based on the mean ratings of all research participants. The results were presented in this fashion to allow the landscapes to speak for themselves and to provide an illustrated overview of the major trends identified for each landscape value. Subsequently, these trends are identified and discussed in light of the participant interviews. It is key to note that the ratings have generated very clear trends which are supported by the data generated from the interviews. Furthermore, the content analysis method also allowed for the identification of sub-themes and

enabled a finer-grain analysis of the identified trends. For example, under the concept of naturalness, five distinct themes which influences ratings of naturalness have been identified.

The fifth section provides an overview of the landscapes which were selected by the participants as being their favourite and an accompanying explanation. This was completed as a wrap-up exercise at the end of the interviews. The results indicate a strong consensus among the participants. Selections from the responses given by the participants provide for a great summary and outline the holistic approach participants took in assessing the landscape. Many of the themes and sub-themes identified in Sections 1 through 4 reappear and are reiterated. Additionally, the results provide a graphical view of how landscapes typify particular themes and relationships between sub-themes.

The sixth section discusses the differences and similarities among the three user groups selected for this research. The ratings for each of the four landscape values are provided as a mean rating for all participants and then as a mean rating for each group. The interview data, in conjunction with the themes identified in Sections 1 through 4 are used to explore how use and value assessments by each group lead to similarities and differences.

4.2 Preference

Figure 4.1 provides an illustrated overview of the mean landscape preference ratings in descending order beginning with the most highly preferred image. The specific mean ratings have been included in Table 4.1. The qualitative data presented after Figure 4.1 are structured in a manner which outlines the aspects that are felt to influence the research participant's preference ratings the most to the least. This is based on the number of instances in which they were cited and the trends which developed from the rankings.

Table 4.1 – Mean Preference Ratings

Image 1	3.33
Image 2	3.27
Image 3	3.73
Image 4	3.27
Image 5	4.20
Image 6	3.80
Image 7	4.53
Image 8	4.27
Image 9	3.73
Image 10	3.27
Image 11	4.33
Image 12	4.60

Figure 4.1 – Ranked Preference Ratings (High to Low)

Image 12



Image 7



Image 11



Image 8



Image 5



Image 6



Image 3



Image 9



Image 1



Image 2



Image 4



Image 10



A review of the illustrated rankings indicated that the most highly preferred landscapes were those with the least amount of human influence. Landscapes that included fences, lights and benches, and paved surfaces tended to be less preferred. Many participants related these landscapes to 'city parks' or 'urban parks' indicating that these landscapes did not fit with the 'naturalized park' expectations of the participants (expressed by 5 participants). The participant interviews also revealed that the most preferred landscapes were those that were the most natural (expressed by 9 participants). In discussing participants' preferences, this became very clear. As one participant succinctly noted,

My like pile consists of images that are mostly natural.

For many it was the landscapes that showed the least amount of human intrusion. (expressed by 6 participants).

The least footprint there is of mankind, the better I like it.

And another,

It is easier to explain why I didn't like them...they were the least natural.

And another participant in discussing the landscape which she preferred the most cited that she liked the ones that

...showed the least amount of human intrusion

One participant clearly expressed what the lack of human influence meant to her in a naturalized park landscape. In discussing her most preferred landscape, image 11, she noted:

It doesn't look as if that anything has been done to it on a large scale. There are no fences. There are no structures. Basically you are walking through a forest that looks like it has been untouched. Whereas some of the forest with the fences in it, you just (pause)

when I go for a walk and look at nature I want to go to some place that I think nobody else has ever been before. I mean you know someone has, obviously, but it is that sense of belonging and owning that space while you are in it. When you see fences and benches, it just doesn't seem to be as personal as something like this (11) would be.

Also landscapes that participants felt were interesting or exciting were also highly preferred (expressed by 8 participants). The use of focal points (large boulders), diverging paths, and winding (vanishing) paths were cited as generating this feeling of interest or excitement. A participant clearly outlined this when she said,

This one (12) was interesting because it had a divided path, which would give you more options for walking or seeing things. I like all the trees. I like the vegetation. That would be interesting to me. 8 was interesting also. It has a bit of a path, which I think would be nice for mobility, but the rocks are interesting, as well as the trees and the vegetation.

And,

Ya I like that one (12) because you can make a choice, which is always exciting. Ya know, that's awesome.

In discussing image 10, another participant noted that straight paths had the opposite effect,

Well it's not interesting ... usually with parks you are wondering. You are not going from A to B. It's the journey, not the destination when you are in a park.

For many participants it was difficult to explain why or how a landscape element generated interest, however it was plainly apparent to them that they did. As one participant in discussing image 8 noted:

I like the little rock feature, because whatever, I mean it is planted there, but it still kind of adds a little something something.

Another participant was better able to put it in words what the rock focal points meant to her,

They are natural. They are interesting. Children like to climb on them. People my age rest on them. They are fun to look at. You sometimes find little bits of quartz and what-have-you in them. It just adds natural interest to the landscape.

This comment also highlights how the type of focal point used is important. The participant used the term natural twice to describe the rock focal points. The other focal point used in this research, the gazebo, was viewed as ‘man-made’ and ‘out of place’ in the landscape (expressed by 8 participants). Accordingly, image 4, wherein the same design paradigm was at work as in image 12 and 8, was ranked second last in the mean rating while image 12 ranked first and image 8 ranked fifth. As one participant noted,

Yes yes, and the use of natural things such as rocks as features instead of a man made structure. It is about making good use of the natural environment. You could go to the mall and sit on bench like that.

It was this ‘something-something’ that may have lead image 12 to be the most preferred. The diverging paths and focal points created an interesting landscape. This is why image 12 ranked higher than image 11. Open landscape images like image 3, which while predominantly natural were cited by a number of participants as being ‘boring’ (expressed by 5 participants). This is also likely why image 3 ranked lower than image 5 and image 6. which contained features that may be regarded as making the landscape seem less natural.

The landscapes in images 5 and 6 were also more highly preferred as they subtly balanced nature and people. They generally ranked lower than the more natural landscapes, but higher than those in which this perceived balance was not achieved. As a participant noted,

I like the ones that show a partnership, and foster an appreciation for nature...or the partnership between man and nature.

Or as another described it,

So it's just a balance that I really like. A balance of 'go softly through nature please'. (similar comments expressed by 5 participants).

The form and look of design elements also influenced preference judgments. The gazebo was generally disliked by participants (expressed by 8 participants); it was often cited as not fitting with the landscape or it was not clear what purpose or function it served. The fences also generally received a strong negative reaction (expressed by 6 participants). Many participants were unable to clearly explain why, but they generally noted that the fences seemed out of place. Alternatively, if it was interpreted as denoting a boundary with private property abutting the park landscape it also was perceived negatively. Participants accordingly saw the fences as barriers (comments expressed by 4 participants). As one participant noted, to them the fence said

'keep out!', 'don't go on the other side of the fence.' So, and I don't know what's over there, but it is a barrier.

A similar feeling was discussed by another,

The fence tells me that I am not free to go anywhere I want to. Although you wouldn't be marching around in it because it is all treed and high grass, the fence makes me hesitate, stop. It is a bit of a loss of freedom

In discussing image 5 a different participant noted,

...it is a beautiful and natural setting, but all the sudden now this fence is in there and it just takes your eyes. There's a barrier, or there's a reason, or there is something that affects you to think that maybe this is somehow divided, maybe that's private property, maybe this is public property. It just gives it a separation issue of some sort and I didn't like that.

For them, the 'fence as a barrier' limited their ability to explore and enjoy the landscape. To one participant this was the opposite of what naturalized parks should encourage,

But again, to me I think (in naturalized parks) you are trying to encourage people to go into a natural space. And I see that (the fence) as being a barrier for having them go into the space...

Another participant agreed. In discussing the water in image 8 a participant noted,

...and there is no fence to keep you away from it, if you wanted to look for tadpoles or frogs or something.

Participants also felt that the form of the path, as a landscape element, needed to fit with the landscape (expressed by 7 participants). In a discussion of paths a participant noted,

I mean the trees are not lined up in straight lines. ... I think when the trees are randomly placed the path should be as well.

This further indicates that the fit of the landscape elements with the participant's expectations related to naturalized parks also played a role. There seemed to be a clear determination that benches, lights and hardened paths were more consistent with what participants called 'city' or 'urban' parks. Primarily this was a function of these elements not fitting with the landscape. Secondly, these elements also led participants to believe that there would be a greater likelihood of meeting others in the park landscape. A sentiment developed among participants that landscapes that seemed as though they would offer a limited chance of meeting others

were more highly preferred (expressed by 6 participants). In a discussion of her favourite landscape, image 12, a participant noted,

I feel like I could walk through there by myself and not walk into many people.

In reference to why she liked landscape image 7 over image 3, a participant noted,

I see this (3) as being more accessible and maybe that's the thing. This is more accessible, so it is going to have more people. If you are looking for quiet time, which is why quite often you would go to a smaller park, I would get that here, in number 7, not in number 3.

Another participant, in discussing her favourite landscape, image 12, noted,

It feels like those paths were created just by people who have repeatedly experienced the space. But it does not look like there would be enough people walking through that space that I would be running into them when I was using the space.

Participants also noted that path form could indicate that they may encounter uses which they felt were incompatible or they disliked (expressed by 3 participants),

This one (10) looks like it is paved, a hard top, where you could have someone coming by on a bike or a motorized vehicle. I would think those vehicles might be on this path. Whereas this one (12) I would think only people walking would be on number 12.

Another participant also shared a similar concern in comparing image 11 and 12. She felt that on the straight path in image 11 she may encounter a snowmobiler while cross-country skiing. Whereas in image 12 she thought there would be a lesser chance because it was 'curvy'.

The open landscape generally did not rate highly among participants, even those that were devoid of human influence or human-made elements and those that were designed with focal points or winding paths. Participants noted a number of reasons for this. Microclimate was identified as an issue. The open landscape was identified as

being 'hot' and 'sunny' and not a place where participants would like to sit and walk (expressed by 4 participants). Even if the landscape contained elements that they liked, it still generally received a low preference, as it was not a landscape they would commonly use. As a participant noted,

...but 2, 1, 3, 4 all look like open field and it looks hot to me. There is a nice curved path there. There are trees. But I just like walking with more shade.

Alternatively the riparian and the path landscapes were considered to be 'cool' and 'shaded' and more enjoyable places to be (expressed by 6 participants).

The presence of water was also cited as being something participants liked (expressed by 8 participants). Primarily, the water served as something interesting to look at and enjoy, but some participants noted the effect water would have on the microclimate (expressed by 4 participants). For example,

...the stream and water...it is cool and it is refreshing and I am thinking there is probably going to be some water action and something nice to look out on. ...there is just something about the water flow that I just really really like.

Another participant noted,

I like the looks of that (8) because the water coming through stuff always makes it seem more calming.

Visual scale within the landscape was also a component of participant preference (expressed by 6 participants). The visual scale of the large open landscape was not preferred. The openness did not generate interest or excitement. As one participant noted,

Again, it's how inviting visually is it? Not knowing (pause). There is just nothing that I am thinking that I can see that when I get down there I know will be nice. And in 4 ...it looks hot there. It does not look inviting and cool. There is nothing else that I think I am going to see in that walk.

The enclosed landscape of the wooded path increased preference. However, the width of this path within this landscape was important. As one participant noted,

I like that the pathways are wider and they are inviting in that you can see quite a ways down the path, which for me is sort of like a safety issue. Like you want to be able to see further down the path so that you can have an action plan if you see something you don't like you can always turn around. You know I want to be able to see down where I am going.

She later continued,

I don't like to have surprises even though I am in a setting like that. You know you are supposed to be relaxed and enjoying it. And that allows me to enjoy it more because I can see ahead of me.

4.3 Naturalness

Figure 4.2 provides an illustrated overview of the mean landscape naturalness ratings in decending order beginning with the the image with the highest percieved naturalness. The specific naturalness ratings have been included in Table 4.2. The qualitative data presented after Figure 4.2 are structured in a manner which outlines the aspects that are felt to influence the research participants' ratings of naturalness from the most to the least based on the number of instances in which they were cited and the trends which developed from the rankings.

Table 4.2 Mean Naturalness Ratings

Image 1	3.13
Image 2	2.67
Image 3	3.67
Image 4	3.00
Image 5	3.87
Image 6	3.13
Image 7	5.00
Image 8	4.53
Image 9	3.40
Image 10	2.87
Image 11	4.33
Image 12	4.27

Figure 4.2 Ranked Naturalness Ratings (High to Low)

Image 7



Image 8



Image 11



Image 12



Image 5



Image 3



Image 9



Image 1



Image 6



Image 4



Image 10



Image 2



Perceived landscape naturalness was a function of a number of things. Primary among these were the presence, scale and form of human intervention. These concepts were found to play a primary role in participant determinations of naturalness. Additionally, ecology, specifically indications of ecological integrity, and to a lesser extent human process or human agency, were found to influence naturalness ratings.

Presence was often related to terms such as 'man made', 'altered by man' or 'built' (expressed by 8 participants). Almost all participants noted that images that contained these elements were considered to be less natural or not natural at all (expressed by 13 participants). The primary examples that were cited were the gazebo, benches and lights.

Related to presence, the scale of human intervention was also cited as being important in determinations of naturalness. For example the size and extent of the paths in the landscapes often impacted the participant's judgments. The wide and hard paths in images 2 and 10 were considered to be very unnatural (expressed by 6 participants).

Additionally form of elements, or the type, shape, colour, and material was also a consideration (expressed by 7 participants). Generally, these assessments were linked to the concepts of coherence and disturbance, or rather a perceived lack of 'fit' in terms of form. For example, the landscapes with fences were viewed as being of a moderate level of naturalness. Images 5, 9 and 1 ranked in the middle of the group higher than those images that included benches or lights. One participant explained,

These with the fences, 1 and 9, are more natural because you could imagine a farmer's fence going through the meadow or through the forest or whatever. These look very very contrived with the lighting and benches. It's almost like a paved path in 10, as in 2. So a bit more planned.

Another remarked,

And in these (5 and 9)..., the fence there looks natural, kind of, you know. You see fencing in the fields there all the time. Fence lines and things like that.

However, in explaining a low sorting for image 1, she highlighted a key point.

The fence here (1) looks like it is not natural, because it is kind of following you know the (pause) it does not really look to be (pause) it is not a property line. It does not really look even tall enough to stop anything from jumping over it. It seems rather intentional.

Additionally, another participant in discussing the fence noted,

Once again, fences are necessary, but this could be a cedar rail fence, which would fit in a little more with the naturalness of the landscape.

This indicates that analysis when it comes to fit is very subtle. In this case it was the perceived intentionality and the fence material used that generated a low assessment of fit.

Still, to many other participants, the fence was viewed as decreasing perceived naturalness (expressed by 8 participants). As one participant noted in a discussion of images 5 and 8,

Like I mean with the rock (8), you could let yourself believe that it fell from the sky, but not so with the fence.

Form of the path was also identified by the participants (expressed by 5 participants). For example, in discussing image 11, a participant noted,

This one here is most definitely man made. It could even be an old abandoned railway tack. (11). ...very rarely are you going to find any natural path which goes perfectly straight.

Another noted,

...this one (path in 12) is a bit more jagged and a little bit more meandering. It's a little bit more natural. It's how you might walk through nature anyways.

The importance of form as it related to naturalness was summarized by one participant when she stated,

You want to see something that meanders a little bit, mimics what you might find naturally, but that compliments the landscape, versus gives the impression of cutting through it. And maybe that is where some of these hardened structures seem to do that. In number 10 it seems to do that. It is like, 'oh here is a great setting' and 'SLAM!' this just goes down there, and it is imposed just on top of the landscape, instead of trying to work with it. ...Which is why these ones (12 and 11) really speak to me a lot more. Assuming this was a big tree here or stump (12) ...it is like you are trying to work with what was there and work around it, versus, you know 'we will pick this up and bulldoze it down, and we are going to slam this surface down over top.' And I guess that's the natural perspective, right. It is working with what's there instead of trying to change what's there. And it is a subtle difference, but there is a difference nonetheless.

This sentiment was echoed by another participant who noted,

...the whole gazebo things just looks too planned for me. And maybe that's what bothers me here (6) too, you know, it looks like they just planned this place to sit down instead of making it more random.

Naturalness also was also function of ecological process for some of the participants (expressed by 4 participants). As one participant noted:

I chose them (images 1, 2, 3 and 4) to be the least natural just because I can tell it has been deforested.I mean it really opens it up, which is fine, but it just kind of stood out to me as being not natural.

She continued:

...and so even though the path varies, like I would say 3 is probably the least and 2 is the most developed, it is probably small in comparison to the fact that there has been a lot of trees harvested for a number of reasons.

She also noted:

And then 6 and 10 both have pretty distinct paths and there is a lamp in 6 and benches and it is in a forested area, and so it is natural, but it has just been augmented a bit.

This demonstrates that to her, the presence, scale and form of human intrusion on the landscape as depicted by the paths and design elements were secondary to perceived evidence of significant ecological disruption, or lack thereof, in her determination of naturalness.

In reference to image 4, another participant noted,

I think it is not very natural. There's a very sharp line between the forested area and the field area. I would expect to see some successional growth of trees and what not.

The same participant also noted that the meandering form of the stream increased her perceived naturalness of the riparian landscape depicted in image 8. She explained it was a combination of these factors that caused her to provide image 7 with a high rating for naturalness,

Number 7 looks incredible natural. Again, because of the meandering water. ...you can see smaller trees and larger trees (successional growth).

In a similar vein to ecology, naturalness was also assessed in terms of human process in light of history and agency (expressed by 6 participants). Those landscapes that showed the presence of human intention, but looked like they evolved over time were still considered natural. In discussing a high rating of naturalness for image 12 a participant noted,

...and from what I can see, whatever it is, it has been worn down into a path over the years (12).

In reference to image 12 another participant noted,

...this one is a bit more jagged and a little bit more meandering. It's a little bit more natural. Its how you might walk through nature

In discussing the same image a different participant noted,

I like the fact that it feels really natural. It feels like those paths were created just by people who have repeatedly experienced the space.

Human agency, or the scale of landscape impact that was within the means of a single individual was also considered to be more natural. As a participant noted,

...look at number 9 for example, if I walked up and down that path a gazillion times, I might leave that same footprint, whereas I would never leave the footprint I see in 10 or any of the other unnatural ones.

4.4 Accessibility

Figure 4.3 provides an illustrated overview of the mean landscape accessibility ratings in decending order beginning with the the image with the highest percieved accessibility. The specific accessibility ratings have been included in Table 4.3. The qualitative data presented after Figure 4.3 are structured in a manner which outlines the aspects that are felt to influence the research participants' ratings of accessibility from the most to the least based on the number of instances in which they were cited and the trends which developed from the rankings.

Table 4.3 Mean Accessibility Ratings

Image 1	4.13
Image 2	4.67
Image 3	4.47
Image 4	4.40
Image 5	3.27
Image 6	4.20
Image 7	2.80
Image 8	3.87
Image 9	4.20
Image 10	4.67
Image 11	4.07
Image 12	4.20

Figure 4.3 Ranked Accessibility (High to Low)

Image 2

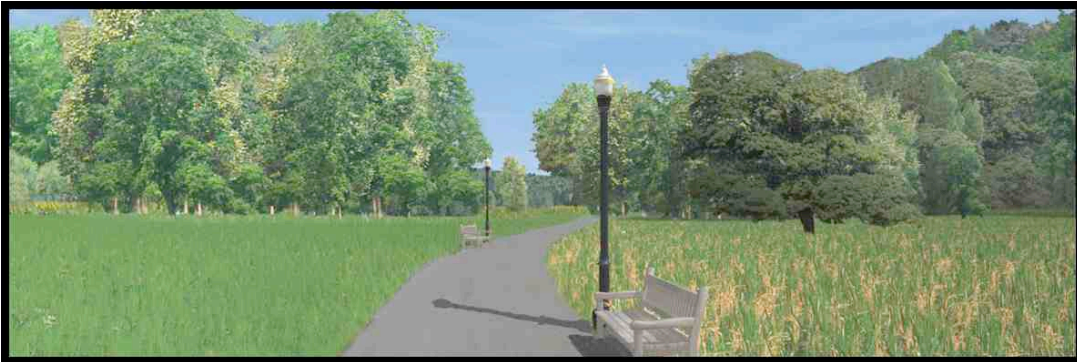


Image 10



Image 3



Image 4



Image 6



Image 9



Image 12



Image 1



Image 11



Image 8



Image 5



Image 7



Accessibility was primarily considered a function of path availability and path type and form (expressed by 15 participants). As one participant noted:

And for 7, there is no path and it looks like a pretty wet area so you would probably need hip waders or something. And so not too many people can access that. ...and the same for 5, there does not seem to be much of a path to the wetland. I mean it would be nice for wildlife, but maybe not for human access. And 8, even though it looks like there is a path, it does not look to be friendly for a bike or if you have improper footwear or something.

In discussing landscapes of low accessibility another noted,

5 and 7 because they show no path. You would have to make your own way. So in terms of mobility it would be difficult.

A similar sentiment is found in discussions of moderate accessibility,

So most of these are in my middle range for accessibility (1, 3, 4, 9, 8, 11 and 12). That's because they have trail. These look more like gravel, so it's not as easy as the asphalt if you have a walker or a wheel chair or a cane or something.

The above statements were reflective of many of the participant's views.

Accessibility was primarily considered a function of path availability, type and form.

The availability of places to rest was also cited as being important (expressed by 7 participants). In discussing the benches one participant noted,

So it lets me...if I can sit, I can get up and go further throughout the day.

For him, the opportunity to rest meant that he could spend a longer period of time in the park and therefore enjoying nature. The ability to be in nature was important for him. He specifically liked image 6 because

It has got a path that lets me get to it. It has got benches that I can sit and watch nature in it.

Landscape elements such as paths and fences also played a role in a more cognitive aspect of accessibility (expressed by 6 participants). In a discussion of the landscape that they would use often, one participant noted

...1 and 9 joined my pile only because of the addition of the fence. And only because it would lend more to a controlled environment. It would show that it is maintained. That perhaps I was actually supposed to be walking down this path. Versus, if it was just in an open field, I would be...I don't know, am I supposed to be there?

Another participant noted,

It (1) has got the fence, which provides something to follow as a landmark. The grass seems manicured by the path as well.

In discussing image 9 another noted,

And I kind of like the idea of the fence line in there because it gives you the idea that this is the trail that you should be following.

These comments indicate that it was important for these participants to know that this was somewhere that they should be. Generally this related to these participants wanting to know that the path they were on, or the direction in which they were headed was leading to 'somewhere'. Essentially they wanted to know that when they came around the next corner the landscape would still be accessible and fitting with that which came before it. As one participant described it,

And number 5. I just wouldn't go there. This looks like the landscape would get rough, you know, beyond what I can see.

And another,

A path gives you confidence in an unknown territory and that's a good thing.

This was shared by another,

...(in 10) the pathway is nice and wide. So like I know this is a pathway I can be on. Like this one (8) is sort of like 'are you meant to walk down here or not' – like it is there but is

it meant for public. Like am I going to go down there and it is going to get, you know, all swampy. These two look as if they are maintained for someone to walk on.

Additionally, the presence of a path or other element such as a fence generated a feeling of comfort or safety, which increased feelings of accessibility (expressed by 7 participants). As one participant noted,

I think there is a comfort in seeing something familiar like that in what may be perceived as an unfamiliar setting.

And another, in discussing a well-defined path noted,
Somehow I feel like I am in the wilderness in a place I can be in the wilderness.

Other landscape elements that were not specifically part of the accessible paradigm were viewed however as supporting physical accessibility. This included the fences as one participant noted you could grab a hold of it to steady yourself, or the large rocks with another participant noted were good for leaning on as a means of resting (expressed by 4 participants).

4.5 Use

Figure 4.4 provides an illustrated overview of the mean likelihood of use ratings in descending order beginning with the the image with the highest likelihood of use. The specific use ratings have been included in Table 4.4. The qualitative data presented after Figure 4.4 are structured in a manner which outlines the aspects which are felt to influence the research participant's ratings of likelihood to use from the most to the least based on the number of instances in which they were cited and the trends which developed from the rankings.

Table 4.4 Mean Likelihood to Use Ratings

Image 1	3.40
Image 2	3.47
Image 3	3.67
Image 4	3.40
Image 5	3.27
Image 6	3.87
Image 7	3.33
Image 8	3.87
Image 9	3.73
Image 10	3.53
Image 11	4.13
Image 12	4.13

Figure 4.4 Ranked Use Ratings (High to Low)

Image 11



Image 12



Image 6



Image 8



Image 9



Image 3



Image 10



Image 2

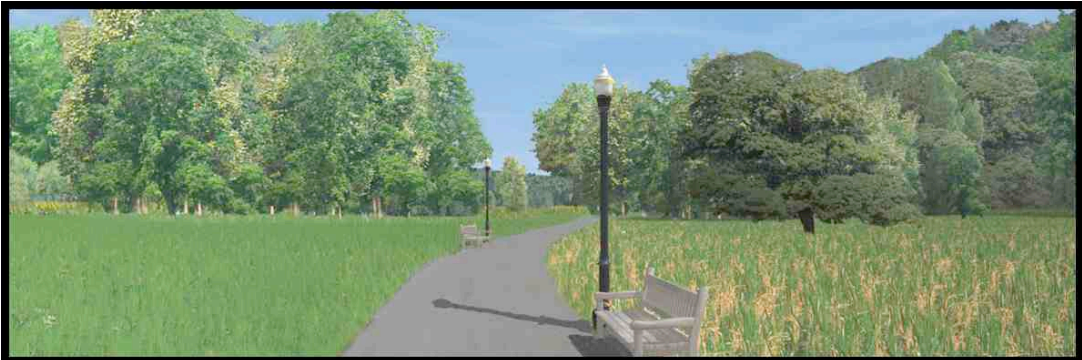


Image 1



Image 4



Image 7



Image 5



The ranked ordering above indicates that participants sought a balance between wanting a natural landscape and accessibility. The top ranked images are those which combine a natural landscape, with points of interest and a moderate level of accessibility. The images in the middle either lacked points of interest or had a high degree of accessibility, which reduced the overall perceived naturalness. The two lowest ranked images were also those that were found to have the lowest accessibility.

Participant ratings and judgments of the landscapes that would be the most used versus the least used tended to balance preference and practicality (expressed by 7 participants). For example, one participant who generally had a high preference for only the most natural landscapes provided a clear explanation as to why she would use many of those that had a lower degree of preference. She said,

Well like again, you know, I have a young family right now. And speaking from that perspective, these places 3,5,1,2,9 they are a nice balance between being accessible and providing opportunities to me to bring my family out. ... but they are still natural.

She further explained,

...there's the practicality of it certainly. You know if I need to be in the park for two hours to walk to get to my preferred places, I am prepared to do that on a Saturday in the summer for example. But I also know sometimes I just want to get my kids out just to go, you know? So I would be prepared to bring my kids to experience someplace like (11)... ...there is a hardened enough path he could his bicycle down there.my one year old, he could kind of get down and toddle along there as well, but were still in, when you look off the path, there is still the kind of environment that I like.

In another way, this was expressed by another who stated that she would likely use them all,

Ya. I wouldn't not go to a park because it has got a gazebo, ya know, or anything like that. I pretty much go to any park that is available to me. So if it has to do with what I would dream up ideally, then I can be more picky. But if there is a park and it has a gazebo, then I am not going to say, well I am not going to go there.

For some participants, meeting their accessibility requirements was a primary objective (expressed by 7 participants). As one participant noted

The benches give me a longer time to be in the environment. The pathway leads me into the environment.

For others the availability of features in the landscape which could satisfy their interests was paramount (expressed by 5 participants). As one participant noted,

Ya ya, it's more than just walking. It's discovery too. And you have to leave them natural or there is nothing left to discover. Like wild flowers. If you are lucky you find little wild strawberries. And rabbits and little animals like frogs and snakes. You know, when you start paving too much you lose that, but there is place for that.

Generally the landscapes that were cited as the most likely to be used by the participants struck a balance between naturalness, accessibility and interest.

4.6 Participant's Favourite Landscapes

As a round-up exercise to the sorting exercise and interviews, the participants were asked to select their favourite landscape and explain why they selected that particular landscape. Those landscapes and a selection from those comments have been included below as they provide a good summary of the concepts taken as a complete evaluation through the eyes of the participants.

Table 4.5 Participant Selected Favourite Landscapes

Image Number	Number of Times Selected
Image 12	6
Image 8	4
Image 6	3
Image 11	1
Image 9	1

Figure 4.5 - Image 12



I like the fact that it feels really natural. It feels like those paths were created just by people who have repeatedly experienced the space. But it does not look like there would be enough people walking through that space that I would be running into them when I was using the space. Umm...it's not kept to the same degree that the other ones are. It gives me options. I can either go right or left and I don't necessarily know where one is going to take me. And it reminds me of that park that I like at home.

Again, I just really like dense forests. And I like that the path is gravel and it kind of chooses a natural way and it looks like it might have just developed slowly over time by people walking through it. Probably minimal maintenance. It just looks really natural and inviting, and you could still easily walk through it. And I don't know, I feel like I could walk through there by myself and not walk into many people. I don't know...I just like it!

Um it looks natural. There is a lot of vegetation and greenery. There is a divided path, so you could just go in and wonder. So it gives you options. The rock is interesting.

Figure 4.6 - Image 8



...because it has a water feature. It has a rock feature. It looks cool. The path is not straight. It's gravel, it's uneven. It's natural looking.

... because it has got a path. It has a little bit of the water. It's definitely open. There is no other man made look to it, even though that might be a placed rock. It just has a very calming, solitary, secluded, Mother Nature look to it.

I am going to say 8 because it is the balance because it is very natural. The path getting there is very natural. It seems kind of remote, but the path makes it accessible to me as a family person. So I can bring my whole family out there to appreciate it. So that's why that one is my favourite. It provides accessibility my family, because it is not just about me getting out there, it is about bringing other people o those things that I enjoy and I want to be able to share them, especially with small kids. I think it is important they grow up with that.

8 is my absolute favourite. Absolutely. Because it has wetlands. Because it looks like there is pasture (indicated right hand corner), because it has been made accessible, but it has not been groomed.

Figure 4.7 - Image 6



Well I prefer everything to be a natural environment, nothing where the trees are taken down. I like it that it has got water in it. Natural water. It has got a path that lets me get to it. It has got benches that I can sit and watch nature in it. And it is lit for night time.

It is on a nice groomed path, and there is the light. I think this one would allow (pause) it seems to be a balance of man and nature. It seems that way because of the path and because of the benches and the light for safety, people can still got here and appreciate the natural beauty of the area, versus (pause) it is very peaceful. And it has a little more shade, besides being out in the sun too. I would not go out and sit on a bench in the streaming sun.

I guess it is because it is quite and serene and you could go and sit on that bench and you have got the water there and the trees. It would probably be a nice spot to sit and reflect.

Figure 4.8 - Image 11



It does not look as if that anything has been done to it on a large scale. There are no fences. There are no structures. Basically you are walking through a forest that looks like it has been untouched. Whereas some of the forest with the fences in it, you just...when I go for a walk and look at nature I want to go to some place that I think nobody else has even been before. I mean you know someone has, obviously, but it is that sense of belonging and owning that space while you are in it. Ugh when you see fences and benches, it just doesn't seem to be as personal as something like this (11) would be.

Figure 4.9- Image 9



I think that would be my first choice for a walk. ...my preference would probably be to walk in and among the trees, as number one ... because I would feel comfortable. Somehow I feel like I am in the wilderness in a place I can be in the wilderness.

4.7 Group Differences and Similarities

4.7.1 Preference

The table below provides the ranked ordering of the images based on rated preference. The results are shown given as mean rankings for all participants and then for each group individually.

Table 4.6 Ranked Preference Ratings – Mean and All Groups, High to Low

Mean	Environment Group	Civic Group	Accessible Group
Image 12	Image 12	Image 7	Image 12
Image 7	Image 7	Image 8	Image 11
Image 11	Image 11	Image 12	Image 7
Image 8	Image 8	Image 5	Image 8
Image 5	Image 5	Image 11	Image 5
Image 6	Image 6	Image 4	Image 6
Image 3	Image 3	Image 10	Image 9
Image 9	Image 9	Image 6	Image 3
Image 1	Image 1	Image 9	Image 2
Image 2	Image 2	Image 3	Image 1
Image 4	Image 4	Image 2	Image 4
Image 10	Image 10	Image 1	Image 10

With regard to preference there was generally a strong consensus as to the most preferred among all three groups. Each group ranked the same images as the top 5, however the orders did vary somewhat. During the interviews it was apparent that there was a strong preference for natural settings by all groups despite the expected different value and use orientations (expressed by 11 participants, all groups). As one accessible group participant noted,

...at my age I would like to sit down, but I would rather have a log. You know, when I am out in parkland, I like things natural. I would rather have a log left there that you could sit on, then a bench like this.

Later she added,

So I like a path at this age. I used to like to ramble. But now I like a path, but I don't like a straight one.

To some extent, the civic group ranked the landscapes differently. Of note is the higher ranking for images 4 and 10 the lower ranking for 11 and 3 and 1. Images 4 and 10 may have been provided a higher ranking because they provided for a more accessible landscape, which included everyone from toddlers to families to seniors. As a participant from the civic group noted,

And in looking at this picture in 10, it certainly would be accessible for everyone. It looks well developed. The fact that it has lighting in 6 would be a bonus. And it appears to be the same stream that could be in the other picture, except it has been enhanced with the benches and the light. But to me, if I am looking to go and find a peaceful and restful place, I would go to one of these that has the benches, because when I get there I am going to be tired and I will want to sit down, and I am not going to want to sit down on the swamp. (similar comments expressed by 3 other civic participants).

The gazebo in image 4 also indicated the opportunity for gathering or events. In relating the landscapes in images 6 and 4 back to her own experience one civic group participant noted,

You are sitting in and amongst nature. You can feel like you are a part of it if you can sit there. And this is what we do in our community with the benches and the gazebos and we go though many times and see people enjoying them. And we will come over to this one and they are fishing of it, and then they will go and spend the day and have a picnic and they fish. I find these kinds of things are more so that people can go out and enjoy nature around them. (similar comments expressed by 3 other civic participants).

The civic group may have also ranked images 11, 3 and 1 may have been ranked lower because they were not completely natural, such as image 7 which was highly ranked by all, but also did not show the universal accessibility or functionality as present in images 10 and 4. As one civic group participant noted,

I am just more for the polished...everything has got to be polished for me, versus back to nature thing. But I do need... I mean they are nice, they are almost there, but I would

prefer the more developed path over the nature path, that's all. (similar comments expressed by 3 other civic participants).

4.7.2 Naturalness

The table below provides the ranked ordering of the images based on rated naturalness. The results are shown given as mean rankings for all participants and then for each group individually.

Table 4.7 Ranked Naturalness Ratings – Mean and All Groups, High to Low

Mean	Environment Group	Civic Group	Accessible Group
Image 7	Image 7	Image 7	Image 7
Image 8	Image 8	Image 8	Image 8
Image 11	Image 11	Image 12	Image 11
Image 12	Image 12	Image 11	Image 12
Image 5	Image 5	Image 3	Image 5
Image 3	Image 3	Image 4	Image 3
Image 9	Image 9	Image 5	Image 9
Image 1	Image 1	Image 9	Image 6
Image 6	Image 6	Image 6	Image 1
Image 4	Image 4	Image 1	Image 10
Image 10	Image 10	Image 10	Image 2
Image 2	Image 2	Image 2	Image 4

Perceived naturalness rankings for each group showed a strong consensus. The three groups showed similar trends in their assessments of naturalness. All groups saw the presence of man-made elements as reducing naturalness (expressed by 13 participants, all groups). This is why all groups ranked images 2, 10 and 6 in the lower half. Each group also ranked image 6 the highest of those three, which was consistent with the interview responses that ranked 6 high due to the scale of development and the setting (expressed by 6 participants). All groups agreed that images 1, 9 and 5, which were perceived to have a less of a presence or elements (fences), fit better with a naturalized landscape and accordingly ranked them in the middle of the pack. Image 7 was perceived to be the most natural, as it lacked visible signs of human influence. It

was members of the environment group who generally mentioned ecology of the landscape as influencing naturalness (expressed by 3 environmental participants). However, images that were perceived to be ecologically disrupted did not rank lower than they did in other groups. The one significant difference was the higher ranking of image 4 by the civic group. This may have been related to the broader acceptance of the gazebo in the landscape given the public benefit that they generally felt it served (expressed by 3 participants). In essence they were willing to overlook what others saw as being ‘man made’ and ‘out of place’.

4.7.3 Accessibility

The table below provides the ranked ordering of the images based on rated accessibility. The results are shown given as mean rankings for all participants and then for each group individually.

Table 4.8 Ranked Accessibility Ratings – Mean and All Groups, High to Low

Mean	Environment Group	Civic Group	Accessible Group
Image 2	Image 10	Image 4	Image 2
Image 10	Image 2	Image 10	Image 10
Image 3	Image 3	Image 2	Image 3
Image 4	Image 4	Image 12	Image 9
Image 6	Image 12	Image 1	Image 6
Image 9	Image 1	Image 6	Image 4
Image 12	Image 11	Image 9	Image 11
Image 1	Image 8	Image 3	Image 12
Image 11	Image 6	Image 11	Image 1
Image 8	Image 9	Image 8	Image 8
Image 5	Image 5	Image 5	Image 5
Image 7	Image 7	Image 7	Image 7

All groups agreed that the landscapes in images 5 and 7 were the least accessible. This was primarily a function of the lack of a path (expressed by 9 participants, all groups). The higher ranking of image 9 by the accessible group versus

the other two groups may be an indication that the fence in image 9 did not fit with a standard notion of accessibility among those outside of the accessible group. While to those inside the accessible group, the fence was identified as both something that they could grab a hold of and use to steady themselves and also a landscape element and with the path, which generated feelings of safety and comfort (expressed by 3 accessible participants). This knowledge of landscape accessibility may be a function of experience. For those who do not face accessibility concerns, the role of the fence in supporting physical and cognitive accessibility was not apparent. As described by one accessible group participant,

I can visually see further down the pathways. So that's inviting. So I can see all the way down there, and that (what she can see at the end) is pleasant enough that I want to go down to that point. And I am fairly confident that I will be able to see the next part of the path when I get there because it is good here and good here, and I can see quite well all the way down.

This is also why image 12 was ranked lower by the accessible group than the other two groups, as the diverging and narrowing paths most likely indicate the opposite. Whereas to the environmental and civic group the path in image 12 is simply considered moderately accessible. It is unclear as to why the civic group ranked image 3 lower and image 4 so much higher than the other two groups.

4.7.4 Use

The table below provides the ranked ordering of the images based on rated likelihood to use. The results are shown given as mean rankings for all participants and then for each group individually.

Table 4.9 Ranked Use Ratings – Average and All Groups, High to Low

Mean	Environment Group	Civic Group	Accessible Group
Image 11	Image 12	Image 12	Image 11
Image 12	Image 11	Image 11	Image 12
Image 6	Image 8	Image 8	Image 6
Image 8	Image 7	Image 6	Image 9
Image 9	Image 6	Image 9	Image 8
Image 3	Image 3	Image 10	Image 10
Image 10	Image 1	Image 4	Image 3
Image 2	Image 5	Image 3	Image 2
Image 1	Image 9	Image 2	Image 4
Image 4	Image 10	Image 1	Image 5
Image 7	Image 2	Image 7	Image 1
Image 5	Image 4	Image 5	Image 7

In terms of use, there is a strong consensus on the upper end of the rankings. All groups ranked images 12 and 11 in the top two, along with images 8 and 6 in the top five. The landscapes depicted in these images tended to balance people and nature, which was a landscape aspect which participants sought when selecting which ones they would use (expressed by 7 participants, all groups). The environmental group had a much higher use rating of images 5 and 7. This group tended to not be limited by the lack of accessible paths, or were more willing to accept a non-accessible landscape given the ecological functions and merits it held (expressed by 3 environmental participants). As explained by one participant from the environmental group,

I am an aquatic biologist, so that probably explains a lot. So that (7) just appeals to me and I would probably get out there in my rubber boots or something. It would be nice to

have these spaces available to the public even if they were not easily accessible...but just to get out there. I may even do field trips with friends.

In a similar fashion image 10 was ranked much lower by this group. To the participants of this group the wide and paved path represented unnecessary environmental damage (expressed by 3 environmental participants). As one participant put it,

...these have asphalt paths, which is great for access, but not necessarily great for the environment just because it does tend to smother out a lot of the vegetation and it does not allow for rain to precipitate through the soil.

To members of the other groups the path created accessibility or an opportunity to walk side by side with friends and family (expressed by 5 civic and accessible participants). As one civic group participant noted,

And again number 10 is just lovely. Again, nice because you have access for people with young families, toddlers or seniors or people in wheel chairs. ...even if you had a bunch of you, you could still walk down the path and have lots of room for walking and that.

And another noted,

And in looking at this picture in 10, it certainly would be accessible for everyone.

4.8 Statistical Correlation

The results indicate a strong correlation between all groups in ratings of preference (.575 - .933) and naturalness (.782 - .972). Correlations of ratings of accessibility were still strong, but generally lower (.519 - .698) and significant to approaching significance. Correlations of ratings of use were strong (.773) and significant between the civic and accessible groups, but weak (.083 - .229) and lacked significance between the environmental group and the civic and accessible groups. These results highlight the trends apparent in the rankings where the greatest similarity was seen in ratings of naturalness and preference, weaker similarities in accessibility, and greater similarity in ratings of use between the civic group and the accessible group, than the environmental group. Also note, with the exception of ratings of use, there was a stronger correlation between the ratings of the environmental group and the accessible group and the environmental and civic group than the civic and accessible group. Overall, with the exception of use there is a strong and significant correlation between the ratings of the visual landscape variables by the different groups.

Table 4.10 Correlation of Group Preference Ratings

			EnvGroup	CivicGroup	AccessGroup
Spearman's rho	Environmental Group	Correlation Coefficient	1.000	.664*	.933**
		Sig.(2-tailed)	.	.018	.000
		N	12	12	12
	Civic Group	Correlation Coefficient	.664*	1.000	.575
		Sig.(2-tailed)	.018	.	.050
		N	12	12	12
	Accessible Group	Correlation Coefficient	.933**	.575	1.000
		Sig.(2-tailed)	.000	.050	.
		N	12	12	12

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Table 4.11 Correlation of Group Naturalness Ratings

			Env Group	CivicGroup	AccessGroup
Spearman's rho	Environmental Group	Correlation Coefficient	1.00	.871**	.972**
		Sig.(2-tailed)	.	.000	.000
		N	12	12	12
	Civic Group	Correlation Coefficient	.871**	1.00	.782**
		Sig.(2-tailed)	.000	.	.003
		N	12	12	12
	Accessible Group	Correlation Coefficient	.972**	.782**	1.00
		Sig.(2-tailed)	.000	.003	.
		N	12	12	12

**. Correlation is significant at the 0.01 level (2-tailed).

Table 4.12 Correlation of Group Accessibility Ratings

			EnvGroup	CivicGroup	AccessGroup
Spearman's rho	Environmental Group	Correlation Coefficient	1.000	.582*	.698*
		Sig.(2-tailed)	.	.047	.012
		N	12	12	12
	Civic Group	Correlation Coefficient	.582*	1.000	.519
		Sig.(2-tailed)	.047	.	.084
		N	12	12	12
	Accessible Group	Correlation Coefficient	.698*	.519	1.000
		Sig.(2-tailed)	.012	.084	.
		N	12	12	12

*. Correlation is significant at the 0.05 level (2-tailed).

Table 4.13 Correlation of Group Use Ratings

			EnvGroup	CivicGroup	AccessGroup
Spearman's rho	Environmental Group	Correlation Coefficient	1.000	.083	.229
		Sig.(2-tailed)	.	.798	.473
		N	12	12	12
	Civic Group	Correlation Coefficient	.083	1.000	.773**
		Sig.(2-tailed)	.798	.	.003
		N	12	12	12
	Accessible Group	Correlation Coefficient	.229	.773**	1.000
		Sig.(2-tailed)	.473	.003	.
		N	12	12	12

** . Correlation is significant at the 0.01 level (2-tailed).

4.9 Summary

As hypothesized the results tend to indicate a complex relationship between the four selected design paradigms, the four visual landscape values assessed and the different participant groups. While some connections are more obvious, other results that are less obvious became apparent, such as the cognitive accessibility aspect of path form and fence availability. There were numerous cases where elements from a design paradigm were identified as supporting unexpected landscape values, such as the diverging paths (expected to produce interest and therefore the use value), were also identified as supporting the naturalness value as straight paths were perceived as less natural, even if in a more overall natural landscape. Group assessments of the landscape values were complex. For example the strong consensus in preference across groups indicates multiple or unexpected use and value orientations across groups which can significantly alter expected landscape value judgments.

Discussion and Conclusion

5.1 Introduction

This chapter provides a broader discussion of the results presented above, and places the results in context of the existing literature. Again this addresses the first two of the research question:

- 1) What are the relationships between the four design paradigms a) natural state, b) people places, c) visible stewardship, and d) physical accessibility and the four landscape values a) preference; b) naturalness; c) accessibility; and d) use?**
- 2) What are the similarities and differences in landscape value judgments for different groups for naturalized park landscape designs?**

This chapter also provides a discussion of the final two research questions, being:

- 3) Of the four identified design paradigms does a particular design paradigm best suit naturalized park landscapes?**
- 4) How does accessible design relate to the naturalized park landscape?**

5.2 Landscape Values and Design Paradigms

5.2.1 Preference

The results indicate that in the naturalized park landscape the primary driver for preference was perceived landscape naturalness. This was a function of natural elements versus man made elements, the scope or impact of these elements, and the form of these elements and how they related to the concept of 'fit'. Increased

landscape naturalness, as expressed through limited man-made objects or human influence, has been shown in other studies to positively influence landscape preference (Purcell & Lamb, 1998; Ulrich, 1986; Kaplan & Kaplan, 1989; de Groot & van den Born, 2003, Arriaza et al, 2004).

Landscapes that offered elements that generated interest or excitement were also preferred. In line with the findings above, these elements had to be natural to result in an increase in preference. The elements that were cited included large boulder focal points and diverging or winding paths. While not incorporated as a design element, water was also identified as a feature that was interesting or exciting.

As found in other studies (Arriaza et al., 2004) the presence of water was acknowledged as a positive aspect of the landscape and some participants specifically cited its role in creating interest and excitement, opportunities for exploration, or a pleasing microclimate. It did not however cause the riparian landscape to be preferred over other landscapes that did not contain water. In essence, water was not found to be the most significant driver of preference.

It is important to also note what was not highly preferred. Landscapes which incorporated standard accessible design elements such as wide paved paths, benches for resting, and lighting for visibility were not highly preferred. The one exception was the riparian landscape that received a moderate level of support. This is considered a function of the visual impact of the design elements in combination with the general preference for the riparian landscape.

The accessible landscapes were not preferred because of the inclusion of man-made objects, whose form lacked contextual 'fit'. Arriaza et al. (2004) found a very similar trend related to preference and the contextual 'fit' of non-natural (anthropocentric) landscape elements. It also generated expectations of increased use by others, a feature which was not consistent with the naturalized landscape desires and or expectations of the participants. This finding is supported by Chiesura (2004) who, based on frequency distribution, found that the primary motives for visiting urban nature was 'to relax' (n=342), 'to be in nature' (n=254) and 'to escape from the city' (n=154). The motive 'to meet others' scored second last (n=55). Additionally, the results are supported by Schroeder (1982) in which man-made objects such as paths and benches were noted as desirable in forest recreational sites, however this was secondary to nature, and natural elements such as vegetation and water. Schroeder's study also identified that 'few people' and 'peace and quiet' and to a less extent 'solitude' were desirable components, which is reflected in this study.

Using Tveit et al.'s (2006) concepts as a guide, 'visual scale' was not found to strongly or directly influence preference. While the 'open' landscape was generally less preferred this was related to microclimate and interest and excitement. However, it is important to note that visual scale, in the form of visibility, was found to be a component of perceived accessibility. This may indicate a reason for some of the contrasting results related to preference and previous studies on extent of view (see for example Purcell and Lamb, 1998). The results indicate it is not the visual extent of view

that matters, but rather what the extent provides to the viewer based on their needs and wants. This finding suggests an endorsement for the Kaplan's information processing model of preference, however further detailed studies should be completed. It would also highlight the importance of the cognitive approach and qualitative methodologies in preference research.

The results also indicate that landscape form (in this study open, riparian and enclosed path were used) is not a significant driver of preference, where differences in landscape form have been identified previously as impacting preference (Kaplan & Austin, 2004). In essence visual landscapes are a sum of their parts and for the most part those landscapes that were most conducive to 'walkable nature' were most highly preferred, as supported by previous studies (Kaplan, 2007).

5.2.2 Naturalness

This research determined that presence, scale and form of non-natural features of are all important aspects of perceived naturalness. Presence of human intervention was by far the strongest aspect, while the scale and form of that intervention seemed to play a supporting role. In essence, scale and form were used to discriminate once the presence 'question' had been answered. This hierarchy has not been explored by previous studies of perceived naturalness. Additionally this research found that ecology, history and human agency were also factors which impacted perceived naturalness.

The research findings support the work of others who are seeking to explore and develop and understanding of the relationships between the visual landscape and

landscape ecology (Fry et al., 2009; Junker & Buchecker, 2008; Gobster et al., 2007). Participants' identification of ecological health through the visual landscape was apparent in judgments of deforestation (open landscape), lack of successional growth (edge open landscape) and meandering riparian form (riparian landscape). The notion of conceptual overlap between the visual and the ecological (Fry et al., 2009; Ode et al. 2007) is supported by this research, and perceived naturalness may be a means to explore this relationship. This research found that in practice qualitative data is important, and non-ecological factors (such as the presence of a human made object) in an otherwise ecologically robust landscape might skew research results that implement solely a quantitative data methodology. The recognition of ecological process in determinations of naturalness, indicated that the concept of the ecological aesthetic may play a role in the post-modern visual landscape. The results suggest the importance of knowledge and experience, elements held to be critical by other observers (Gobster et al., 2007). Responses were tied to more formal ecological knowledge (environmental group) and indications of the role of tacit knowledge (Purcell & Lamb, 1998) were not strikingly apparent, however, they were there. As one non-environmental group participant noted during a discussion of naturalness,

I find this farmscape (2) really tough to deal with. It is just something...it's tough.

5.2.3 Accessibility

Landscape accessibility is primarily a solution-driven process, limited in its theoretical underpinnings, based on expert opinion and accepted practice (Steinfeld & Danford, 1999). The results indicate that standard accessible design practices such as

wide and hardened paths, and the locations for rest and lighting are perceived as increasing landscape accessibility. However, the results tend to add to this notion by indicating that path availability and form are drivers of these judgments.

The results indicate that perceived accessibility in the landscape was a function of path availability and form. These results are supported by Booth et al. (2000) where perceived form of paths (free of obstacles, 'safe') was linked to increased physical activity among older adults. Additionally, the results indicate that the opportunity for rest was also important. Furthermore, the perceived safety or comfort generated by the landscape, particularly through indicating that it was okay to be in a certain location or that the landscape ahead would be similarly accessible was important. Microclimate was a consideration noted by a number of participants, however it did not strongly influence ratings of perceived accessibility.

5.2.4 Use

Landscape use was expected to be highly correlated to landscape preference as preferred landscape would balance participants landscape needs and wants. Accordingly, it would seem reasonable that the most highly preferred landscapes are also those that would receive the greatest use. This study found that park landscapes that were rated with the highest likelihood of use were generally those that were highly preferred, though this relationship is not as clear as others. As indicated by the low use ranking but high preference ranking of images 5 and 7, path availability did significantly increase likelihood to use. This discontinuity can be viewed in light of the Kaplan's (1983) person-environment (P-E) compatibility theory. Accordingly images 5

and 7 can be viewed as having a low P-E as the environmental features do not provide for park user's needs, nor fit with their motivations and actions – although a better fit was found with the environmental group participants, as expected. As Kaplan (1995, p.174) points out,

There should be a compatibility between the environment and one's purpose and inclinations. In other words, the setting must fit what one is trying to do and what one would like to do. Compatibility is a two way street. On the one hand, a compatible environment is one where one's purposes fit what the environment demands. At the same time the environment must provide the information needed to meet one's purposes. Thus in a compatible environment one carries out one's activities smoothly and without struggle.

The results indicate that the participant's determination of likelihood to use a particular landscape was based on assessment of how it balances their competing wants and needs. Wants can be considered values whereas goals and needs are affordances. This wants and needs and values and affordance relationship is fitting of Kaplan's notion of compatibility. Herzog et al. (2011) further lends support to the concept of compatibility in landscape assessments, as they determined that individuals are sensitive to notions of compatibility in the landscape. Compatibility, and to a lesser extent preference, are important aspects of likelihood of landscape use.

5.3 Group Similarities and Differences

The 'beholding eye' (Meinig, 1976) has for some time been recognized as a component of the visual landscape. It is the human mind that interprets and makes meaning of the visual landscape. This research, based in a cognitive theory of landscape perception and assessment, hypothesized that groups with different use and value

orientations would have highly dissimilar visual landscape preferences. However the results indicate that while differences do exist and the cognitive pathway to preference formation may take different journeys, there was a surprising consensus about the most preferred naturalized park landscapes.

Brush et al. (2000) noted the importance of understanding group differences in landscape preference. They noted that few studies to date have critically examined difference between subject groups. As a partial force behind this, they cited government research funding directives that sought “an empirical basis for establishing standards of aesthetic quality” (2000, p.44). Essentially, in the end there needs to be a preference for ‘one size fits all’ solutions. They further noted “a better understanding of differences in landscape preferences among social groups may contribute to landscape plans that are more responsive to needs and tastes of sub-cultures within our society.” They supported research that seeks not universality, but that attempts to develop a better understanding of shared landscape values. This research has followed in the vein, and has developed some interesting findings.

As noted above, it was hypothesized that each group would prefer the landscapes that reflected a design paradigm that was considered to be in line with their use and value orientation. However, the results indicate that this simplistic assumption is far from true and that there is a much greater consensus. This indicates that the use and value orientations have to do more with the expectations and ‘wants’ in naturalized park experiences than the specific backgrounds of the research participants. All participants sought a pleasurable landscape, filled with natural elements that provided

interest and excitement; the ability to explore and some level of comfort and safety. While the scope, mix and ratio of these elements differed, the landscapes which were most preferred were those that allowed for this continuum of use. This was evident in the seeking of a 'balanced' landscape in the likelihood to use exercise. The naturalized park user is not a static individual. The 'tadpole hunting' biologist was also the mother of a young family. The person with the limited mobility was also seeking a highly natural landscape experience. A similar multi-dimensionality of participants across groups was found by Hunziker (1995) in preference for afforested agricultural lands. He also noted the importance of 'interest-dependent weights'. There is not a one-sized-fits all solution, but there is an opportunity to design highly preferred and highly used naturalized park landscapes through understanding shared values, seeking balance and always being conscious of 'form'.

One thing is clear, people love and seek a connection to nature and people wish to experience visual landscape with a high degree of naturalness. This finding is supported by de Groot and van den Born's findings (2003) that showed that the majority of users preferred the wild to deep ecology landscape over man-made or park like landscapes. There was a greater preference for landscapes that showed a higher level of ecology (11, 12, 8) and those that showed a 'deep ecology' (7) among all groups.

This research also indicates that the selected groups may have much more similar landscape values than originally hypothesized. This finding supports Moore et al.'s (1996) finding that the trail preferences of adults with disabilities and those without were more similar than they were different. The landscape preference and use ratings,

when combined, were very telling. They indicated that many common landscape use and value orientations existed across the participant groups. Additionally, while each participant self identified with a particular group in the demographic questionnaire, 80% of participants selected the people-nature park value statement of “Parks should be places for people to use, but primarily places for nature.” This research accordingly supports the idea of the development of theoretical models ‘that embrace rich, transactional nature of environment-behavior phenomena and measures that quantify what is perceived and important to inhabitants’ as described by Lantrip (1999, p.292). While subject variables are important, they do not define the human-environment relationship.

One explanation of the greater similarities than expected between the groups may be found in taking a broader view of use and value orientations. While the groups were expected to have different use and value orientations and therefore seek out the design paradigms which provided corresponding affordances, it could be that when a broader view is taken the groups are similar in that their primary motivation in the naturalized park landscape is recreation. This is unlike previous studies that found differences in group assessments (van den Berg, Vlek and Coeterier, 1998; Ryan 1998; Rogge et al., 2007) where the broader landscape motivations of the participant groups had a greater degree of dissimilarity.

5.4 Best Design Paradigm?

One of the primary objectives of this research was to determine if one of the four identified design paradigms offered a best practice in designing naturalized parks. The results indicate that each design paradigm had positives and faults.

The natural state design paradigm is supported by the works of Gobster and based on the philosophy of Aldo Leopold's land ethic. It is tied to the concept of the ecological aesthetic in that it holds that natural state landscapes will be highly preferred when combined with ecological knowledge. It was expected that landscapes designed in this manner would be highly preferred, and that the environment group participants would prefer landscapes designed in this manner the most. The results indicate that the high perceived naturalness inherent in these landscapes did support high preference. However, image 3, a natural state landscape ranked in the middle of the pack indicating perceived naturalness and high preference are not universal. This research found that purposeful design, such as the use of focal points and diverging path, which only incorporate natural elements are also highly preferred. The preference for these landscapes that offered interest and excitement was also strong among participants from the environmental group. There was also an indication of a strong preference for natural state design among other groups. For example, images 7 and 11, ranked 1st and 5th for the civic group and 2nd and 3rd for the accessible group.

The people places design paradigm focus on designing landscapes to achieve a balance of psychological imperatives in the landscape. These imperatives were developed by Kaplan and Kaplan and are Mystery, Complexity, Coherence and Legibility.

The academic side of this work was synthesized by Kaplan, Kaplan and Ryan's (1998) book *With People in Mind*. It was expected that the people places landscapes would be highly preferred because they provide for people's 'needs' on an affective psychological level. Furthermore, it was hypothesized that these landscapes would be the most preferred by those participants in the civic group, as their focus was on supporting parks for people. It was unclear if the other participant groups would respond in a similar fashion. The results indicate that there was a strong preference for landscapes designed in this manner. This was found to be a function of the interest and excitement that the design generated. Additionally, these landscapes, when incorporating natural elements, were perceived as highly natural and therefore preferred. Designs which used 'man-made' elements were much less preferred. Although the same design principles were used this landscape did not generate interest or excitement. The results indicate that there was a strong preference for the people places design among the civic group participants. The other participant groups also shared a high preference for this design paradigm, however, both the environmental group and the accessible group ranked the landscape with the man made element (image 4) second last.

The visible stewardship design paradigm originates from the work of Joan Nassauer (1992; 1995a; 1995b; 2001; 2004) and Sheppard (2001). The core concept at work is that using indicators of care of maintenance or culturally familiar frames increase preference for natural or more 'wild' landscapes. It was not known if this design would be favoured among a particular group, but it was felt that it would be given higher preference by the civic group and to a lesser extent the accessible group.

The results indicate a moderate to low level of preference by all groups. The visible stewardship landscape with the highest rating was also that which had the highest perceived naturalness. Surprisingly, the civic group ranked two of the visible stewardship landscapes lower than the other groups. These landscapes may have been preferred more by the environment group as they showed limited disruption and by the accessible group as the landscape elements used supported physical mobility (support) and cognitive accessibility (safety and comfort). For the civic group participants, it may have been a case that the landscapes were less preferred because they were not 'wild' or 'polished' and this middle ground could be interpreted as being less park like or people friendly.

The accessible design paradigm was identified as a social need. The design was implemented based on the best practices outlined in *Time-Saver Standards for Landscape Architecture* (Harris & Dines, 1998) and provided Canadian park-specific context through *Design Guidelines for Accessible Outdoor Recreation Facilities* (Parks Canada, 1994). It was expected that these landscapes would have a low level of preference among the environmental group. It was expected that the landscapes would be highly preferred by the accessible group and moderately to highly preferred by the civic group. While the design was often cited as 'being important', or participants recognized its purpose, or how it could accommodate their secondary needs (family), or even their future needs (aging) these sentiments did not transfer to higher overall preference. The results indicate that the accessible design landscapes generated a low preference. While two landscapes (images 4 and 10) ranked the lowest, one landscape

(image 6) ranked in the middle. This was most likely a function of the visual presence of the design elements (foreground) and its relationship to the landscape (provided a view of the water / did not go through the landscape). It is interesting to note that the images were equally less preferred by both the accessible group and the environment group. A key outcome of the research was that the accessible group had a higher preference for landscapes that fit with their expectations of the naturalized park while still providing a moderate level of accessibility. All landscapes designed in this manner did achieve a moderate preference from the civic group. This was a result of the accessible landscape providing a 'polished' design that was accessible to many users from toddlers to large families or groups to those with accessibility concerns.

5.5 Impacts of Incorporating Accessible Design

This research initiates a discussion on the impacts of incorporating accessible design in naturalized park. The two concepts, naturalized landscapes and traditional physical accessibility design, initially seem incompatible. However, as current research into natural environments indicates, exposure to nature can be extremely beneficial to both physical and mental health (Chang et al., 2008; Kaplan, 2001; Grahn & Stigsdotter, 2010; Hartig et al., 2003, Matsuoka & Kaplan, 2008). In North America, we are on the verge of a significant growth in an older population. It can be expected that this will come with an increase in the need and demand for both physically and cognitively accessible landscapes. Therefore, naturalized parks may represent an ideal form of inexpensive passive health therapy for an aging population with increasing quality of life demands. The question becomes how to incorporate accessible design while not

negating the value of exposure to nature though lessening the perceived naturalness. Accordingly, the impact of accessible design in naturalized parks needs to be assessed. It is clear that this is an area of research of critical importance.

The existing literature is very thin on the impacts on the visual landscape of incorporating accessible design into a naturalized park landscape. This research provides a beginning for future studies. The primary finding is that 'standard' accessible design does not 'fit' with the naturalized landscape. The 'man-made' feel of these elements serves to reduce overall preference and perceived naturalness. This lack of fit was apparent in both the visual landscape (presence, scale and form) and also in a more subtle way, as the indication that there would be a greater likelihood of meeting others in those landscapes. It will be difficult for 'standard' accessible design practices to shake the 'city park' feeling which was incompatible with the naturalized park expectations of all users.

However, the results also indicate that there may be an opportunity to develop other accessible design practices that would provide for a better fit. This would be important to all park users, including those who require accessible landscapes, as even among this group there was an expectation of a landscape with a high level of perceived naturalness. One example is the 'unintentional fence'. This design element, if completed in a manner that provided the proper form and fit, could serve to provide for physical mobility needs (support) and cognitive aspects of the accessible landscape (safety and comfort). Based on the results of this study, this would not significantly reduce the preference for or perceived naturalness of the naturalized park landscape.

Accordingly, the main consideration that must be made is the balance between naturalness and accessibility. This research found that naturalness and accessibility were similar in terms of participants' assessments being based on the presence, scale and form continua. However, these continua arise in direct opposition to one another. Naturalness was about limited presence and scale of human intervention and complementary form, and accessibility was about robust presence and scale of human intervention that required non-complementary form. There is no question that these two landscape design paradigms are at odds. What is natural is not accessible and what is accessible is not natural. An exploration of this balance should be a part of future studies.

One of the primary objectives of this research was to develop a starting point to further explore accessible design in naturalized landscapes. A significant point of inspiration was Mullick's (1993) article and his five unanswered questions. These questions and the manner in which this research informs them have been outlined below.

1) Should there be definable limit on human intervention that will maintain the aesthetic integrity of the natural environment?

This research indicates that yes, there needs to be a limit on the presence of human intervention in a naturalized landscape that will assist in maintaining the aesthetic integrity of the landscape.

2) Can man-made objects in the natural environment be designed to complement the aesthetics of nature?

This research indicates that yes, man-made objects can be designed to complement the aesthetics of nature. The scale and especially the form of man-made objects must 'fit' with the landscape. Form was found to have impacts on both the visible and cognitive judgments of preference and naturalness.

3) Is there a tolerable limit of human intervention in the natural environment?

While this research did not specifically seek to define a 'tolerable limit' it is expected that one may exist based on lower preference given the inclusion of man-made landscape elements. For example, selecting design elements with the proper form, which also fit with the landscape will assist in staying within this limit. This study's results indicate there is a point at which human intervention in a natural landscape degrades preference and perceived naturalness.

4) Can the natural environment be made fully accessible, without damaging it permanently?

While further research is required, this research does indicate that there is at least an opportunity for a fit between accessible design and naturalized landscapes. In future pursuits, creativity and recognition of context will be vitally important.

5) What is the minimum level of human intervention that can empower people with disabilities to make independent use of the natural environment?

The participants from the accessible group indicated that at minimum a path through the landscape must be provided. The provision of areas of rest, and design that generates safety and comfort also seemed to be a required minimum. However, this research and these findings are limited in that they do not cover the full array of accessibility needs in the landscape.

5.6 Implications for Planning & Research

5.6.1 Naturalized Parks: Importance, Ideals and Expectations

As the preference ratings indicate there was a very strong preference for the naturalized park landscape across all design paradigms and all groups. The ratings range of 3.27-4.60 equates to a strong endorsement of the concept of the naturalized park (a similar 'clustered upper end' test was used by Purcell & Lamb, 1998). Participants related their connections to the natural world throughout the interviews and spoke of the importance of contact with nature, which is supported by previous parks studies (Burgess et al., 1988), and the wider body of environmental psychology (Chang et al.,

2008; Kaplan, 2001; Grahn & Stigsdotter, 2010, Pretty 2004, Matsuoka & Kaplan, 2008, Wells & Evans, 2003, Herzog et al., 2003; Staats & Hartig, 2004; Bodin & Hartig, 2003; Herzog et al., 1997).

Overall the results indicate that the design of naturalized parks is not as straightforward as selecting a design paradigm and implementing it. There is a greater need to be aware of the particular aspects related to naturalized parks, including expectations, and also an awareness of the relationship between the design and the landscape. This contextual element is generally what influenced the landscape preference of the research participants. It is all about 'fit' and balancing people's needs with the expectations of naturalized landscapes and park use.

In relation to expectations, the results indicate that there is a naturalized park archetype. The archetype is a landscape that balances people and nature. It is a landscape that feels wild, personal and untouched on one hand and secure and comfortable at the same time. It is a landscape that provided opportunities for viewing and opportunities for exploring. It is a landscape that provides for accessibility, but in a manner that fits with the naturalized park context.

There is the real possibility that improper design can diminish the quality of the naturalized park visual landscape. Improper design can lead to non-use if the proper balance is not achieved. If the landscape is too 'hard' it loses its naturalized appeal. If the landscape is too soft it limits the ability for access for a wide variety of users.

These results indicate that naturalized park landscapes which incorporate accessible design face hurdles in gaining wider support, but more significantly even if

supported, they would not be generally used or frequented by those who do not require the accessible elements. There is a need to provide for accessibility in a manner which is fitting with the naturalized park landscape. An initial place to start is a movement away from 'standard' design practices. Rather they need to tailor the accessibility to the specific landscape and also gain wider use and support by being sympathetic to the wider expectations of the naturalized landscape among all park users. Exploring the relationship between environment and accessibility was a 'best practice' that was completely overlooked in a recent survey of professional experts published by the National Centre on Accessibility in the United States authored by Voight et al. (2008), which specifically focused on accessibility in parks.

There was however an understanding of why accessible landscape would be important and how they serve others' needs. Many participants noted this, but for most, limited preference was still given to these landscapes despite the acknowledged purpose. This sentiment was summarized by one participant who stated,

Number 6 I like, because again it is a pretty natural area. The water feature looks natural. The forested area in the back. But with a more hardened surface, and the benches and the lighting and what not, it does provide that opportunity to a broader audience and I do have an appreciation for that, which is why I put it in (my moderate preference pile). Not personally because I would go there a lot, but I do have a lot of respect for what this is trying to do.

While the notion of a hybrid park landscape may be appealing, in which parts of the park are accessible, and there are other parts that are more rugged and less accessible, this concept did not sit well with some participants. Simply providing for

accessible points within the naturalized park landscape may not be enough. As one participant noted,

...to me 6 looks pointless. You walk up and you sit on the bench and you look at the nature and you walk away. I want to at least be able to be active and walk. That just does not interest me. It doesn't have enough to do.

What is clear for the results is that accessible design in naturalized parks needs to consider design practices. For example, a number of participants acknowledged that there were other ways in which to achieve the goals of accessibility, which still maintaining the naturalized landscape. For example, on participant noted,

Ya and even this lamp post and bench is kind of in the middle of the forest. It is just a bit too contrived for me. I rather it be leave a fallen log for people to sit on. Ya I like that look better.

5.6.2 Achieving a 'Fitting Balance'

A 'fitting balance' is a primary theme which runs through the results of this study. For example, this fitting balance was evident in the difference apparent in the most highly preferred landscapes versus the most likely to be used. A park comprising of highly preferred landscapes which is infrequently used should not be the goal of a designer or planner in supporting the 'sustainable city'.

As another example, while winding or meandering paths created landscape interest and supported perceived naturalness, it also served to decrease perceived accessibility in relation to safety and comfort as it closed the visual vista.

Another example of the fitting balance is the take away message that standard accessibility design practices do not work for naturalized parks. These practices tend to decrease perceived naturalness and decrease preference. Landscapes designed in this

manner were perceived as highly accessible, but were limited in the likelihood of use, even among participants who hold accessibility concerns.

The recognizing of the importance of seeking balance and fit in the naturalized park landscape was best described by one participant,

Well it is a toss up, isn't it? If you want people to use parks, then you need some kind of walkways that are safe, lighting, signage, bathrooms and all that kind of stuff. So I think you need to make a choice on what you choose to put there so it fits in with the environment and it isn't some glaring purple metal, or whatever. You know?

However, there is the opportunity to generate highly preferred naturalized park landscapes, which retain a high level of naturalness and would provide for increased accessibility. Landscapes designed in this manner would have a higher likelihood of use. The priority needs to be creative design solutions that incorporate and further the following best practices.

5.6.3 Best Practices for Planning & Design

Below a number of best practices have been outlined for professional designers and planners. These practices are specific to the development, design and maintenance of naturalized park landscapes.

1. Limit visible human intention;
2. Where intervention is required limit the scale of that intervention to the minimum required to achieve the required goals;
3. Always consider the form of the design elements and the contextual 'fit';

4. Do not use straight paths. Straight paths are viewed as having a low level of naturalness;
5. Use diverging paths and focal points of natural elements to generate interest and excitement;
6. Use appropriate visible stewardship to support cognitive assessments of safety and comfort in the 'next' landscape. This will increase landscape accessibility.
7. Consider non-standard methods of creating traditional physical accessibility, such as a 'fallen log' bench

5.6.4 Implications for Future Research

In practice through this research, the use of visualizations with a high degree of realism was found to generate strong affective responses from participants. Participants formed mental landscape images, with a number of participants actually linking the landscapes in a progression, (i.e. open, to path to riparian) as if they were taking a journey through the depicted landscape. Participants cited landscape ephemera such as the 'coolness' of the trees, or the noise or movement of the water during their interviews. Participants used implicit and tacit knowledge about natural landscape based on their previous experiences to bring the static images to life. Additionally, participants cited the visualizations as being evocative of a real-world landscape with which they share an emotional connection. No participants complained as the visual quality or their ability to view and interpret the landscape. Accordingly, this research lends support to the continued use of high-realism visualizations as a means to test and assess landscape when practical issues do not allow for on-site testing.

This research used the research of Tveit et al. (2006) as the starting point (see Table 3.8) for the directed content analysis approach. It was found that all comments related to the visual landscape fit within Tveit et al.'s concept framework. The framework components included indicators, attributes, dimensions and concepts. Participants statements were largely found to fall within the indicators and attributes categories. The coherent framework allowed for these specific cited landscape elements to be placed within the broader dimension and concept realms. This facilitated the drawing of linkages between landscape design and visual landscape theory. The results of the coding exercise indicate that this concept framework is a good tool for the content analysis of participant statements related to the visual landscape.

5.7 Study Limitations

It is important to note that these results should not be generalized onto a broader population beyond what is reasonable. As outlined in the literature review, there is not a consensus as to what factors may generate difference in individual preference. To some extent this work attempted to embrace this, acknowledging from the outset that different users will respond differently to different landscapes. Some of the findings may transfer well, whereas others may not.

It is also important to note that inherently the use of visualizations will generate research specific subjects interpretations of the represented landscapes. The results are accordingly a reflection of choices made in constructing the visualizations such as viewpoints, available vegetation billboards, and ephemeral conditions. While efforts

were made to ensure the visualizations were reflective of real world conditions and completed in a manner consistent with supported practices (Sheppard, 2001) the visualizations could have impacted subject responses.

The concept of accessible design implemented in this research study was based in physical accessibility. Accordingly this research does not being to approach the concept of cognitive accessibility. However there is a growing recognition of the need to incorporate cognitive accessibility into public landscapes (Blackman et al., 2003). Future studies should include a much wider spectrum of participants who have accessibility concerns.

5.8 Future Directions

One of the most important areas of future study will be exploring the balance between accessible design and naturalized landscapes. This research indicated that there are clear expectations when it comes to naturalized park landscapes. All groups, including accessible group participants, held these expectations. This may be a reflection of the restorative benefits of the exposure to nature or a biological preference for nature. Whatever the mechanism, there is a need to determine academically and in practice how this balance can be achieved.

References

- Abello, R.P. & Bernaldez, F.G. (1986). Landscape preference and personality, *Landscape and Urban Planning*, 13, 19 – 28.
- Akbar, K.F., Hale, W.H.G. & Headley, A.D. (2003). Assessment of scenic beauty of the roadside vegetation in northern England. *Landscape and Urban Planning*, 63, 139-144.
- Appleton, J. (1975a). Landscape evaluation: the theoretical vacuum. *Transactions of the Institute of British Geographers*, 66, 120-123.
- Appleton, J. (1975b). *The experience of Landscape*. London, U.K: J. Wiley and Sons.
- Arthur, L. M. (1977). Predicting Scenic Beauty of Forest Environments: Some Empirical Tests. *Forest Science*, 23(2), 151-160.
- Arriaza, M. Canas-Ortega, J.F., Canas-Madueno, J.A. & Ruiz-Aviles, P. (2004). Assessing the visual quality of rural landscapes. *Landscape and Urban Planning*, 69, 115-125.
- Balling J. D. & Falk, J. H. (1982). Development of visual preference for natural environments. *Environment and Behavior*, 14(1), 5-28.
- Benfield, J., Bell, P., Troup, L. & Soderstrom, N. (2010). Aesthetic and affective effects of vocal and traffic noise on natural landscape assessment. *Journal of Environmental Psychology*, 30, 10-111.
- Bergen, S. McGaughey, R. J. & Fridley, J. L. (1998). Data-driven simulations, dimensional accuracy and realism in a landscape visualization tool. *Landscape and Urban Planning*, 40, 283-293.
- Beza, B. (2010). The aesthetic value of a mountain landscape: A study of the Mt. Everest Trek. *Landscape and Urban Planning*, 97, 306-317.
- Bjerke, T., Ostdahl, T., Thrane C. & Strumse, E. (2006). Vegetation density of urban parks and perceived appropriateness for recreation. *Urban Forestry & Urban Greening*, 5, 35-44.
- Bodin, M. & Hartig, T. (2003). Does the outdoor environment matter for psychological restoration gained through running? *Psychology of Sport and Environment*, 4, 141-153.

- Booth, M. L., Owen, N., Bauman, A., Clavisi O. & Leslie, E. (2000). Social-cognitive and perceived environment influences associated with physical activity in older Australians. *Preventative Medicine*, 31, 15-22.
- Boster, J. S. (1994). The Successive Pile Sort. *Cultural Anthropology Methods* 6(2), 7-8.
- Brady, E. (1998). Imagination and the aesthetic appreciation of nature. *The Journal of Aesthetics and Art Criticism*, 56(2), 139-147.
- Brown, T.C. & Daniel, T.C. (1986). Predicting scenic beauty of timber stands. *Forest Science*, 32(2), 471-487.
- Brush, R., Chenwoeth, R.E. & Barman, T. (2000). Group difference in the enjoyability of driving through rural landscapes. *Landscape and Urban Planning*, 47, 39-45.
- Budd, M. (1998a). Delight in the natural world: Kant on the aesthetic appreciation of nature. Part I: Natural Beauty. *British Journal of Aesthetics*, 38(1), pp. 1-18.
- Budd, M. (1998b). Delight in the natural world: Kant on the aesthetic appreciation of nature. Part II: Natural Beauty and Morality. *British Journal of Aesthetics*, 38(2), pp. 117-126.
- Budd, M. (1998c). Delight in the natural world: Kant on the aesthetic appreciation of nature. Part III: The Sublime in Nature. *British Journal of Aesthetics*, 38(3), pp. 233-250.
- Burgess, J., Harrison, C. M. & Limb, M. (1988). People, parks and the urban green: A study of popular meanings and values for open space in the city. *Urban Studies*, 25(6), 455-473.
- Carlson, A. (1979) Appreciation and the natural environment. *The Journal of Aesthetics and Art Criticism*, 37(3), 267-275.
- Carlson A. & A. Berleant (2004). *The Aesthetics of Natural Environments*. Peterborough, Ontario: Broadview Press Limited.
- Carroll, N. (1993). On Being Moved by Nature: Between Religion and Natural History. In A. Carlson & A. Berleant (Eds.), *The Aesthetics of Natural Environments*. Peterborough, Canada: Broadview Press Ltd.
- Chemero, A. (2003). An outline of a theory of affordances. *Ecological Psychology*, 15(2), 181-195.

- Cheng, C., Hammitt, W., Chen, P., Machink L. & Su, W. (2008). Psychophysical responses and restorative values of natural elements in Taiwan. *Landscape and Urban Planning*, 85, 79-84.
- Chiesura, A. (2004). The role of urban parks for the sustainable city. *Landscape and Urban Planning*, 68, 129-138.
- Daniel, T.C. (2001). Whither scenic beauty? Visual landscape quality assessment in the 21st century. *Landscape and Urban Planning* 54, 267-281.
- Daniel, T.C. & Boster, R. S. (1976). *Measuring Landscape Esthetics: The Scenic Beauty Estimation Method*. USDA Forest Service Research Paper RM-167. U.S. Department of Agriculture
- Daniel, T. C., & Meitner, M. M. (2001). Representational validity of landscape visualizations: The effects of graphical realism on perceived scenic beauty of forest vistas. *Journal of Environmental Psychology*, 21, 61-72.
- de Groot, W.T. & van den Born, R.J.G. (2003). Visions of nature and landscape type preferences: An exploration in The Netherlands. *Landscape and Urban Planning*, 63, 127-138.
- Dearden, P. (1980). A statistical technique for the evaluation of the visual quality of the landscape for land-use planning purposes. *Journal of Environmental Management*, 10, 51-68.
- Dearden, P. (1981). Public participation and scenic quality analysis. *Landscape Planning*, 8, 3-19.
- Dearden, P. (1984). Factors influencing landscape preferences: An empirical investigation. *Landscape Planning*, 11, 293-306.
- Egoz, S. & Bowring, J. (2004). Beyond the romantic and naïve: The search for a complex ecological aesthetic design language for landscape architecture in New Zealand. *Landscape Research*, 29(1), 57-73.
- Eleftheriadia, N., Tsalkidis, I. & Manos, B. (1990). Coastal landscape preference evaluation: A comparison among tourists in Greece. *Environmental Management*, 14(4), 475-487.
- Field, A. (2005) Kaplan, R. & Kaplan, S. (1989). *Discovering Statistics Using SPSS, 2nd Ed*. London: SAGE Publications Ltd.
- Foster, C. (1998). The narrative and the ambient in environmental aesthetics. *The*

- Journal of Aesthetics and Art Criticism, 56(2), pp. 127-137.
- Fraser, E.D.G. & Kenney, W.A. (2000). Cultural background and landscape history as factors affecting perceptions of the urban forest. *Journal of Arboriculture*, 26(2), 106-113.
- Fry, G., Tveit, M., Ode, A. & Velarde, M. (2009). The ecology of visual landscapes: Exploring the conceptual common ground of visual and ecological landscape aesthetics. *Ecological Indicators*, 9(5), 933-947.
- Gibson, J.J. (1979). *The Ecological Approach to Visual Perception*. Boston: Houghton Mifflin.
- Gobster, P. (1994). The Urban Savanna: Reuniting ecological preference and function. *Restoration & Management Notes*, 12(1), 64-71.
- Gobster, P. (1995). Aldo Leopold's Ecological Esthetic: Integrating Esthetic and Biodiversity Values. *Journal of Forestry*, 43(2), 6-10.
- Gobster, P. (1999). An ecological aesthetic for forest management. *Landscape Journal*, 18-19, 54-64.
- Gobster, P. (2001). Forests and landscapes: linking ecology, sustainability and aesthetics. In S.R.J. Sheppard & H.W. Harshaw (eds.) *Forests and Landscapes: Linking Ecology, Sustainability and Aesthetics* (pp. 149- 172). Wallingford, U.K: CABI Publishing.
21-28
- Gobster, P.H., Nassauer, J.I., Daniel, T.C. & Fry, G. (2007). The shared landscape: What does aesthetics have to do with ecology. *Landscape Ecology*, 22, 959-972.
- Godlovitch, S. (1994). Icebreakers: Environmentalism and Natural Aesthetics. In A. Carlson & A. Berleant (Eds.), *The Aesthetics of Natural Environments*. Peterborough, Canada: Broadview Press Ltd.
- Golafshani, N. (2003). Understanding reliability and validity in qualitative research. *The Qualitative Report*, 8(4), 597-607.
- Grahn, P. & Stigsdotter, U. (2010) The relation between perceived sensory dimensions of urban green space and stress restoration. *Landscape and Urban Planning*, 94, 264-275.
- Greider, T. & Garkovich, L. (1994). Landscape: The social construction on nature in the environment. *Rural Sociology*, 59(1), 1-24

- Guest, G., Bunce, A. & Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. *Field Methods*, 18(1), 59-82.
- Hands, D. & Brown, R. (2002) Enhancing visual preference of ecological rehabilitation sites. *Landscape and Urban Planning*, 58, 57-70.
- Harris, C. & Dines, N. T. Eds. (1998) *Time-Saves Standards for Landscape Architecture: Design and Construction Data (2nd Ed.)* New York: McGraw-Hill Publishing Company.
- Hartig, T., Evans, G.W., Jamner, L.D., Davis, D.S. & Garling, T. (2003). Tracking restoration in natural and urban field setting. *Journal of Environmental Psychology*, 23, 109-123.
- Herzog, T., Black, T., Fountaine K.& Knotts, D. (1997). Reflection and attentional recovery as distinctive benefits of restorative environments. *Journal of Environmental Psychology*, 17, 165-170.
- Herzog, T., Maguire, C. & Nebel, M. (2003) Assessing the restorative components of environments. *Journal of Environmental Psychology*, 23, 159-170.
- Herzog, T., Hayes, L., Applin, R. & Weatherly, A. (2011). Compatibility: An experimental demonstration. *Environment and Behavior*, 43, 990-1005.
- Hsieh, H. & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, 15(9), 1277-1288.
- Hunziker, M. (1995). The spontaneous reforestation in abandoned agricultural lands: perception and aesthetic assessment by locals and tourists. *Landscape and Urban Planning*, 31, 399-410.
- Jacques, D. (1980). Landscape Appraisal: The Case for a Subjective Theory. *Journal of Environmental Management*, 10, 107-113.
- Jones, K. (2003). What is an affordance? *Ecological Psychology*, 15(2), 107-114.
- Jorgensen, A. & Tylecote, M. (2007). Ambivalent landscapes- wilderness in the urban interstices. *Landscape Research*, 32(4), 443-462.
- Junker, B. & Buchecker, M. (2008). Aesthetic preference versus ecological objectives in river restoration. *Landscape and Urban Planning*, 85(3-4), 141-154.

- Kaltenborn, B.P. & Bjerke, T. (2002a). Associations between landscape preference and place attachment: A study in Roros, southern Norway.
- Kaltenborn, B.P. & Bjerke, T. (2002b). Association between environmental value orientations and landscape preferences. *Landscape and Urban Planning*, 59, 1-11.
- Kaplan, R. (1985). The analysis of perception via preference: A strategy for studying how the environment is experienced. *Landscape Planning*, 12, 161-176.
- Kaplan, R. (2001). The nature of the view from home: Psychological benefits. *Environment and Behavior*, 33(4), 507-542.
- Kaplan, R. (2007). Employees' reactions to nearby nature at their workplace: The wild and the tame. *Landscape and Urban Planning*, 82, 17-24.
- Kaplan, S. (1983). A model of person-environment compatibility. *Environment and Behavior*, 15, 311-332.
- Kaplan, S. (1987). Aesthetics, affect and cognition: Environmental preference from an evolutionary perspective. *Environment and Behavior*, 19(1), 3-32.
- Kaplan, S. (1992). Environmental Preference in a Knowledge-Seeking, Knowledge-Using Organism. In Barkow, J. L. Cosmides & J. Tooby Eds. *The Adapted Mind: Evolutionary Psychology and the Generation of Culture*. New York: Oxford University Press, 581-598.
- Kaplan, S. (1995). The restorative benefits of nature: Towards an Integrative framework. *Journal of Environmental Psychology*, 15, 169-182.
- Kaplan, R., & Herbert, E.J. (1987). Cultural and sub-cultural comparisons in preferences for natural settings. *Landscape and Urban Planning*, 14, 281-293.
- Kaplan, R. & Kaplan, S. (1989). *The experience of nature: A psychological perspective*. New York: Cambridge University Press.
- Kaplan, R., Kaplan, S. & Ryan, R. (1998). *With People in Mind: Design and Management of Everyday Nature*. Island Press, Washington, D.C.
- Kaplan, R. & Talbot, J.F. (1988). Ethnicity and preference for natural settings: A review and recent findings. *Landscape and Urban Planning*, 15, 107-117.
- Kaplan, R. & Austin, M. E. (2004). Out in the country: sprawl and the quest for nature near-by. *Landscape and Urban Planning*, 69, 235-243.

- Kellert, S. & Wilson, E. O. (1993). *The Biophilia Hypothesis*. Washington D.C.: Island Press.
- Kenwick, R., Shammin, M. & Sullivan, W. (2009). Preference for riparian buffers. *Landscape and Urban Planning*, 91, 88-96.
- Kroh, D. & Gimblett, R. (1992). Comparing Live Experience with pictures in Articulating Landscape Preference. *Landscape Research*, 17 (2), 58-69.
- Lantrip, D. B. (1999). Evaluating Models and Measures of Environmental Performance. In *Enabling Environments: Measuring the Impact of Environment on Disability and Rehabilitation*, E. Steinfeld & G. S. Danford (Eds.). New York, NY: Kluwer Academic / Plenum Publishers
- Lewis, J.L. (2006). Culture and the forested landscape : inter and intra-cultural perceptions of modified forest landscapes. Doctoral Thesis; University of British Columbia. Retrieved from: <https://circle.ubc.ca/handle/2429/18265>
- Lothian, A. (1999). Landscape and the philosophy of aesthetics: Is landscape quality inherent in the landscape or in the eye of the beholder? *Landscape and Urban Planning*, 44, 177-198.
- Lowenthal, D. (1978). Finding valued landscapes. *Progress in Human Geography*, 2(3), 373-418.
- Lyons, E. (1983). Demographic correlates of landscape preference. *Environment and Behavior*, 15(4), 487-511.
- Maller, C., Townsend, M., Pryor, A., Brown, P. & StLeger, L. (2005). Healthy nature healthy people: 'Contact with nature' as an upstream promotion intervention for populations. *Health Promotion International*, 21(1), 45-54.
- Matthews, P. (2002). Scientific knowledge and the aesthetic appreciation of nature. *British Journal of aesthetics*, 60(1) 37-48.
- Matsuoka, R. H. & Kaplan, R. (2008). People needs in the urban landscape: analysis of Landscape and Urban Planning Contributions. *Landscape and Urban Planning*, 84, 7-19.
- McHarg, I. L. (1969). *Design with Nature*. Philadelphia, PA: The Falcon Press.
- McLellan, E., MacQueen, K. M. & Neidig, J.L (2003). Beyond the qualitative interview: Data preparation and transcription. *Field Methods*, 15(1), 63-84.

- Meining, D. W. (1976). The beholding eye: Ten versions of the same scene. *Landscape Architecture*, 66, 47-54.
- Moore, R., Dattilo, J. & Devine, M. A. (1996). A comparison of rail-trail preferences between adults with and without disabilities. *Adapted Physical Activity Quarterly*, 13, 27-37.
- Mozingo, L.A. (1997). The aesthetics of ecological design: Seeing science as culture. *Landscape Journal*, 16(1), 46-59.
- Mugica, M. & De Lucio, J. V. (1996). The role of on-site experience on landscape preferences. A case study at Donana National Park (Spain). *Journal of Environmental Management*, 47(3), 229-239.
- Mullick, A. (1993). Accessibility issues in park design: The National Parks. *Landscape and Urban Planning*, 26 25-33.
- Nassauer, J.I. (1992) The appearance of ecological systems as a matter of policy. *Landscape Ecology*, 6(4), 239-250.
- Nassauer, J.I. (1995a) Messy ecosystems, orderly frames. *Landscape Journal* 14(2), 161-170.
- Nassauer, J.I. (1995b) Culture and changing landscape structure. *Landscape Ecology*, 10(4), 229-237.
- Nassauer, J.I. (2001) Meeting public expectations with ecological innovation in riparian landscapes. *Journal of the American Water Resource Association*, 37(6), 1439-1443
- Nassauer, J. I. (2004). Monitoring the success of metropolitan wetland restorations: Cultural sustainability and ecological function. *Wetlands*, 24(4), 756-765.
- Natori, Y. & Chenoweth, R. (2008). Differences in rural landscape perceptions and preferences between farmers and naturalists. *Journal of Environmental Psychology*, 28(3), 250-267.
- Nohl, W. (2001). Sustainable landscape use and aesthetic perception – preliminary reflections on future landscape aesthetics. *Landscape and Urban Planning*, 54, 223-237.

- Ode, A., Fry, G., Tveit, M. S., Mesanger, P. & Miller, D. (2009). Indicators of perceived naturalness as drivers of landscape preference. *Journal of Environmental Management*, 90(1), 375-383.
- Ode, A., Tveit, M. & Fry, G. (2008). Capturing Landscape Visual Character Using Indicators: Touching Base with Landscape Aesthetic Theory. *Landscape Research*, 33(1), 89-117.
- Orians, G. & Herrwagen, J. (1992) Evolved Responses to Landscapes. In Barkow, J. L. Cosmides & J. Tooby (Eds.) *The Adapted Mind: Evolutionary Psychology and the Generation of Culture*. New York: Oxford University Press, 555-580.
- Ozguner, H. & Kendle, A. D. (2006). Public attitudes towards naturalistic versus designed landscapes in the city of Sheffield (UK). *Landscape and Urban Planning*, 74, 139-157.
- Ozguner, H., Kendle, A.D. & Bisgrove, R.J. (2007). Attitudes of landscape professionals towards naturalistic versus formal urban landscape in the UK. *Landscape and Urban Planning*, 81, 34-45.
- Parks Canada Services & Canadian Paraplegic Association (1994) Design Guidelines for Accessible Outdoor Recreation Facilities. Ottawa, Ontario.
- Parsons, R. (1995). Conflict between ecological sustainability and environmental aesthetics: Conundrum, canard or curiosity. *Landscape and Urban Planning*, 32, 227-244.
- Parsons, R. & Daniel, T. C. (2002). Good looking: in defense of scenic landscape aesthetic. *Landscape and Urban Planning*, 60, 43-56.
- Percell, A. T. & Lamb, R. J. (1998). Preference and naturalness: An ecological approach. *Landscape and Urban Planning*, 42, 57-66.
- Penning-Rowsell, E. C. (1981) Fluctuating fortunes in gauging landscape value. *Progress in Human Geography*, 5(1), 25-41.
- Preston, C.C., & Colman, A.M. (2000). Optimal number of response categories in rating scales: reliability, validity, discrimination power, and respondent preferences. *Acta Psychologica*, 104, 1-15.
- Pretty, J. (2004) How nature contributes to mental and physical health. *Spirituality and health International*, 5(2), 68-78.

- Rogge, E., Nevens, F. & Gulinck, H. (2007). Perception of rural landscapes in Flanders: Looking beyond aesthetics. *Landscape and Urban Planning*, 82, 159-174.
- Rourke, T. (2006). The application of affordance theory to explain the landscape preference of travelers. Doctorate dissertation, Graduate School of Clemson University. Downloaded via the ProQuest Dissertation and Thesis Database.
- Ryan, R. (1998). Local perceptions and values for a Midwestern river corridor. *Landscape and Urban Planning*, 42, 225-237.
- Ryan, R. (2005). Exploring the effects of environmental experience on attachment to urban natural areas. *Environment and Behavior*, 37(1), 3-42.
- Saito, Y. (1998). The aesthetics of unscenic nature. *The Journal of Aesthetics and art Criticism*, 56(2), 101-111.
- Saito, Y. (2002). Ecological Design: Promises and challenges. *Environmental Ethics*, 24,(3) 243-261.
- Sargent, F. (1966). Ideas and attitudes: A scenic classification system. *Journal of Soil and Water Conservation*, 21, 26-27.
- Sell, J., Taylor, J. & Zube, E. (1984) Toward a Theoretical Framework for Landscape Perception. In T. Saarianen, D. Seamon & J. Sell (eds.) *Environmental Perception and Behaviour: An Inventory and Prospects*. Chicago, Illinois: The University of Chicago.
- Schroeder, H. (1982). Preferred features of Urban parks and Forests. *Journal of Arboriculture*, 8(12), 317-322.
- Schroeder, H. (1991). Preference and meaning of arboretum landscapes: Combining quantitative and qualitative data. *Journal of Environmental Psychology*, 11, 231-248.
- Sheppard, S. R. J. (1986). Simulating Changes in the Landscape. In R.C. Smardon, J. F. Palmer & J. P. Felleman (eds.) *Foundations for Visual Project Analysis*. (pp. 187-199). New York: John Wiley & Sons.
- Sheppard, S. R. J. (1989). *Visual Simulation: A User's Guide for Architects, Engineers, and Planners*. New York, NY: Van Nostrand Reinhold.

- Sheppard, S. R. J. (2001). Beyond Visual resource Management: Emerging Theories of and Ecological Aesthetic and Visible Stewardship. In S.R.J. Sheppard & H.W. Harshaw (eds.) *Forests and Landscapes: Linking Ecology, Sustainability and Aesthetics* (pp. 149- 172). Wallingford, U.K: CABI Publishing.
- Sheppard, S. R. J. (2001). Guidance for crystal ball gazers: developing a code of ethics for landscape visualization. *Landscape and Urban Planning*, 54, 183-199.
- Shin, W.S., Kwon, H.G. , Hammitt, W.E. & Kim, B.S. (2005). Urban forest park use and psychological outcomes: A case study in six cities across South Korea. *Scandinavian Journal of Forest Research*, 20, 411-447.
- Staats, H. & Hartig, T. (2004). Alone or with a friend: A social context for psychological restoration and environmental preference. *Journal of Environmental Psychology*, 24(), 199-211.
- Stamps III, A. E. (1999). Demographic effects in environmental aesthetics: A meta-analysis. *Journal of Planning Literature*, 14(2), 155-175.
- Steinfeld, E. & Danford, G.S. (1999). Theory as a Basis for Research on Enabling Environments. In *Enabling Environments: Measuring the Impact of Environment on Disability and Rehabilitation*, E. Steinfeld & G. S. Danford (Eds.). New York, NY: Kluwer Academic / Plenum Publishers
- Stewart, T., Middleton, P., Downtown, M. & Ely, D. (1984). Judgments of photographs vs. field observations in studies of perception and judgment of the visual environment. *Journal of Environmental Psychology*, 4, 283-302.
- Sullivan, W., Kuo, F. & DePooter, S. (2004). The fruit of urban nature: Vital neighborhood spaces. *Environment and Behavior*, 36(5), 678-700.
- Summit, J. & Sommer, R. (1999). Further studies of preferred tree shapes. *Environment and Behavior*, 31(4), 550-576.
- Surova, D. & Pinto-Correia, T. (2008). Landscape preference in the Cork Oak Montado Region of Alentejo, Southern Portugal: Searching for Valuable Landscape Characteristics for Different User Groups.
- Tahvanainen, L., Tyrvaïnen, L. Ihalainen, M., Vuorela N. & Kolehmainen, O. (2001). Forest management and public perceptions – visual versus verbal information. *Landscape and Urban Planning*, 53, 53-70.

- Taylor, J. G., Zube, E. H., & Sell, J. L. (1987). Landscape Assessment and Perception Research Methods. In R. B. Bechtel, R. W. Marans, & W. Michelson (Eds.) *Methods in Environmental and Behavioral Research* (pp. 361-393). New York: Van Nostrand Reinhold Company Inc.
- Tempesta, T. (2010). The perception of agrarian historical landscapes: A study of the Veneto plain in Italy. *Landscape and Urban Planning*, 97, 258-272.
- Thwaites, K., Helleur, E & Simkins, I. M. (2005). Restorative urban open space: Exploring the spatial configuration of human emotional fulfillment in urban open space. *Landscape Research*, 30(4), 525-547.
- Tips, W. E. J., & Savasdisara, T. (1986). The influence of the environmental background of subjects on their landscape preference evaluation. *Landscape and Urban Planning*, 12, 125-133.
- Tuan, Y. (1974) *Topophilia: A study of Environmental Perception, Attitudes, and Values*. Englewood Cliffs, New Jersey: Prentice-Hall, Inc.
- Tveit, M, Ode, A & Fry, G. (2006). Key concepts in a framework for analyzing visual landscape character. *Landscape Research*, 31, 229-256.
- Ulrich, R. S. (1986). Human responses to vegetation in the landscape. *Landscape and Urban Planning*, 13, 29-44.
- van den Berg, A.E., Hartig, T. & Staats, H. (2007). Preference for nature in urbanized societies: Stress, restoration and the pursuit of sustainability. *Journal of Social issues*, 63(1), 79-96.
- van den Berg, A.E. & Koole, S.L. (2006). New wilderness in the Netherlands: an investigation of visual preference for nature development landscapes. *Landscape and Urban Planning*, 78, 362-372.
- van den Berg, A.E., Vlek, C.A.J. & Coeterier, J. F. (1998). Group differences in the aesthetic evaluation of nature development plans: A multi level approach. *Journal of Environmental Psychology*, 18, 141-157.
- Voight, A., Robb, G., Skulski, J., Getz, D. & Scharven, D. (2008). *Best Practices of Accessibility in Parks and Recreation: A Delphi Survey of National Experts in Accessibility*. Bloomington, IN: National Center on Accessibility.
- Ward Thompson, C., Aspinall, P., Bell, S, & Findlay, C. (2005). "It gets you away from everyday life": Local woodlands and community use – what makes the difference. *Landscape Research*, 30(1), 109-146.

- Wells, N.M & Evans , G.W. (2003). Nearby nature: A buffer of life stress among rural children. *Environment and Behavior*, 35(3), 311-330.
- Wergles, N & Muhar, A. (2009). The role of computer visualizations in the communication of urban design – A comparison of viewer responses to visualizations versus on-site visits. *Landscape and Urban Planning*, 91, 171-182.
- Yabiku, S. T., Casagrande, D. G. , & Farley-Metzger, E. (2008). Preferences for Landscape Choice in a Southwestern Desert City. *Environment & Behavior* 40(3): 382-400.
- Yang, B. & Brown, T.J. (1992). A cross-cultural comparison of preferences for landscape styles and landscape elements. *Environment and Behavior*, 24(4), 471-507.
- Zheng, B. Y. Zhang & Chen, J. (2011). Preference to home landscape: wildness or neatness. *Landscape and Urban Planning*, 99, 1-8.
- Zube, E. (1973). Rating everyday rural landscapes of the Northeastern U.S. *Landscape architecture*, 63, 370-375.
- Zube, E., Brush, R. & Fabos, J. (1975). *Landscape Assessment: Values, Perceptions, and Resources*. Stroudsburg, Pennsylvania: Dowden, Hutchinson & Ross Inc.
- Zube, E., Sell, J.L. & Taylor, J.G. (1982). Landscape perception: Research, application and theory. *Landscape Planning*, 9, 1-33.

Appendix A – Colour Map



Appendix B – Visualizations

Image 1 Open – Visible Stewardship



Image 2 Open - Accessible



Image 3 Open – Natural State



Image 4 Open – People Places



Image 5 Riparian – Visible Stewardship



Image 6 Riparian - Accessible



Image 7 Riparian – Natural State



Image 8 Riparian – People Places



Image 9 Path – Visible Stewardship



Image 10 Path - Accessible



Image 11 Path – Natural State



Image 12 Path – People Places



Appendix C – Questionnaires

**Please note, pages 6-15 have been omitted as they were the same as page 5 except the title Image 'X'.

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PART 1

Please read and complete the following questions.

Age Range:

- 18-28
- 29-38
- 39-48
- 49-58
- 59-68
- 69-78
- 79-88
- 89+

Gender:

- Female
- Male
- Choose Not To Select

Please indicate below the frequency with which you visit parks in the Summer and Fall months (MAY-OCTOBER)

- Multiple times each day
- Daily
- 2-4 Times a week
- Once a week
- Once every few weeks
- Once a month
- Once ever few months
- Never

Please indicate below the frequency with which you visit parks in the Winter and Spring months (NOVEMBER – APRIL)

- Multiple times each day
- Daily
- 2-4 Times a week
- Once a week
- Once every few weeks
- Once a month
- Once ever few months
- Never

I have lived in an URBAN area:

- 0% of my life
- 25% of my life
- 50% of my life
- 75% of my life
- 100% of my life

I have lived in a RURAL area:

- 0% of my life
- 25% of my life
- 50% of my life
- 75% of my life
- 100% of my life

Please Select ANY that apply:

- I face issues related to the accessibility of public spaces.
IF YES, Please specify ANY THAT APPLY
 - Related to Mobility / Movement
 - Related to Vision
 - Related to Hearing
 - Related to Finding My Way
 - Other [e.g. Chronic Health Issue(s)]...

- I am involved in local or regional civic discussions regarding parks.
IF YES, Check ANY THAT APPLY
 - Local community group related to park(s)
 - Attend City Council meetings related to park(s) issues
 - Remain updated on parks issues through the media
 - Actively engage City Officials in relation to park(s)
 - Member of a City Committee related to park(s)

- I am a member of an active group or organization related to nature, ecology or the environment.
IF YES, Check ANY THAT APPLY
 - Local group / scope
 - Regional group / scope
 - National or Global group / scope
 - Group's primary focus is education
 - Group's primary focus is conservation / restoration
 - Group's primary focus is activism / generating awareness

Please select ONE of the following that best describes how you feel about parks: (ONLY ONE)

- Parks should be places for people to use and enjoy
- Parks should be places where nature can be free take its course
- Parks should be places for nature, but primarily places for people to use
- Parks should be places for people to use, but primarily places for nature

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UP NEXT – PART 2

In the next section you will be asked to rate 12 landscape scenes on a scale of 1-5 in 6 different categories. The categories and scale definitions are as follows:

Preference: How much you like the landscape

1 = Do not like at all

5 = Like very much

Naturalness: How natural you think the landscape is

1= Not natural

5= Completely natural

Use: How likely you would be to use the landscape

1= Would not use

5= Would use often

Movement: How well could you move through the landscape

1= Could not move through the landscape at all

5= Could easily move through the landscape

Willingness to Support: How willing would you be to support a park with this landscape through municipal taxes:

1= I would not be willing to support at all through municipal taxes

5= I would be very willing to support through municipal taxes

PART 2

Please begin with the topmost image. Review the image for up to 20 seconds and then rate the image based on the categories below. Please rate each image individually, and independent of any other image.

Image 1

Please review the LANDSCAPE depicted in the image and circle your rating for each category below

I do not like it at all					I like it very much
1	2	3	4	5	

The landscape is not natural					The landscape is completely natural
1	2	3	4	5	

I would not use it					I would use it often
1	2	3	4	5	

I could not move through the landscape					I could easily move through the landscape
1	2	3	4	5	

I would not be willing to support through municipal taxes					I would be very willing to support through municipal taxes
1	2	3	4	5	

Image 2

Please review the LANDSCAPE depicted in the image and circle your rating for each category below

I do not like it at all					I like it very much
1	2	3	4	5	

The landscape is not natural				The landscape is completely natural
1	2	3	4	5

I would not use it				I would use it often
1	2	3	4	5

I could not move through the landscape				I could easily move through the landscape
1	2	3	4	5

I would not be willing to support through municipal taxes				I would be very willing to support through municipal taxes
1	2	3	4	5

Thank you! Your insight is invaluable.

Your participation is greatly appreciated

Sincerely,

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