Perception of Naturalness in a Hybrid Landscape: A Case Study of Citizens Engaged in Oak Ridges Moraine Conservation

by

Elaine Allison Ferrier

A thesis

presented to the University of Waterloo

in fulfilment of the

thesis requirement for the degree of

Master of Environmental Studies

in

Environment and Resource Studies

Waterloo, Ontario, Canada, 2011

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 revision, as accepted by my examiners. I understand that my thesis may be made electronically available to the public.

Abstract

Conservation in Canada is increasingly driven by land use planning processes. Approaches to governing nature conservation have shifted dramatically from protecting isolated pristine areas to greater attention to the remaining fragments of greenspace in urban, semi-urban and rural areas. The ways that societies govern and use nature are always changing, and these physical management actions are connected to deeply rooted cultural norms and values about the ideal relationship between humans and nature. In the land use planning approach to conservation, citizens and governments find value and construct meaning for remaining nature rather than beginning with normative considerations of what is most worthy of protection. At the root of this conservation planning trend is a growing appreciation for hybrid nature that is valued as natural in spite of the past or present influences upon it. This represents a dramatic shift from the traditional values involved in North American nature conservation, where nature was most valued for its perceived separation from human influence and protected to maintain its untouched qualities. In light of these ideological shifts in the ways that Canadians value and in turn manage nature, is there a corresponding change in the ways that conservation activists perceive environmental value and evaluate naturalness?

An increasing number of studies demonstrate that public valuation of nature is not limited to pristine environments: even highly disturbed environments can be valued as natural and are not perceived as a form of lesser nature. Conceptions of what is natural and what is not are highly subjective and variable; in particular, the body of work on the social dimensions of both invasive species and ecological restoration demonstrates the ways in which people construct naturalness in accord with their values and cultural context. By exploring the extent to which people perceive invasive species as reducing naturalness and how ecological restoration is

perceived to restore it, these subjects serve as excellent conceptual lenses for exploring constructions of nature.

This study explores the subtle variations in environmental values and perception of naturalness among a study population who self-identify as pursuing the same goal: ensuring the continued protection of the Oak Ridges Moraine. The Moraine is a partly urbanized landform in southern Ontario that is situated within a complex hybrid socio-ecological landscape. It is also the subject of an active and high profile conservation movement that has spanned over 40 years. Using a combination of interviews and Q Method, this study explored how citizens engaged in Oak Ridges Moraine conservation perceive both the current and ideal state of naturalness on the Moraine, with specific emphasis on how the discourses these citizens use to frame the Moraine invoke the concept of naturalness

Findings from this study reveal that Moraine activists represent a conservation paradox: they value the natural, non-human qualities of the landform, yet at the same time identify the Moraine as a hybrid landscape with both social and ecological qualities. In particular, respondents indicated a strong interest in naturalness in the context of invasive species and ecological restoration, yet at the same time identified the naturalness of the Moraine to be a lesser priority in the face of urban development pressures. In this way, citizens engaged in Moraine conservation respond to the hybrid quality of the Moraine landscape by moving beyond the binary distinction between nature and society, situating themselves as both apart *from* and a part *of* the landscape at the same time. This finding demonstrates how values for conserving nature are affected by hybridity between social and ecological systems, and suggests how embracing the paradox of hybrid nature can contribute to understanding and managing complex socio-ecological systems.

Acknowledgements

I am indebted to Dr. Brendon Larson for his guidance, supervision and encouragement throughout this project. In particular, I am grateful that he challenged me to think creatively while having the patience to wait out the process.

I gratefully acknowledge funding from an Ontario Graduate Scholarship as well as the Social Sciences and Humanities Research Council of Canada for Standard Research Grant "Stakeholder perspectives on invasive species affecting Canadian forests" (B. Larson 2008-2012).

Thank you to Dr. Dan McCarthy for helping to guide this project, for acting as a member on my committee, and for letting me tag along on as many Moraine events as humanly possible. Thank you to Dr. Anders Sandberg for providing sharing his insights and expertise as an external reviewer. Thank you also to the members of the QMeth listerv, especially to Josh Pritchard of the University of Nevada for his trouble-shooting advice and for hosting the FlashQ study on his personal server.

This study would not have been possible without the wonderful people who opened their homes and hearts to me to share their insights during interviews, or who anonymously shared their views in the online Q study. I truly hope that this research will aid in future management of the Moraine, and I hope to participate in the process in the years to come.

I am incredibly grateful to my friends and family for providing encouragement, support and good cheer throughout this process. Special thanks to my parents, David and Christine Ferrier, for their constant support and enthusiasm about my decision to forego getting a "J-thing" for a few more years; to my sister, Lisa Ferrier, for reminding me that nothing can't be overcome

by a good book and a comfortable bed; to Joel Buxton for his encouragement and provision of excellent study treats; to Kate Leighton, Erin Holden and Beck Love for their love and sisterhood across the miles; to Kristy Wilson for her laughter and excellent dance moves; to Kate Lawson, ever my flashlight beacon in an ice storm; to Charlotte Usselman for keeping my flame alive with the finer points of dog whisperer philosophy; to Ally Dawson for her sympathy and social networking policing; to Dr. Amberley Buxton and future Dr. Gord Hagen for their excellent library companionship; and to my dear friends and comrades in the Master of Environmental Studies program, especially Yukari Hori, Mary-Beth Deline, Michelle Craig, Nava Dabby and Tavis Bragg who were wonderful company on this excellent journey.

Table of Contents

List of Figures

List of Tables

Introduction

The processes and practices of nature conservation exist within a rich cultural context. The ways that societies govern and use nature are always changing, and these physical management actions are connected to deeply rooted cultural norms and values about the ideal relationship between humans and nature. In Canada, both government and civilian perspectives towards nature have altered the ways that nature is governed and managed. In particular, philosophies governing nature conservation have shifted dramatically from protecting isolated "pristine" areas to greater attention to the remaining fragments of greenspace in urban, semi urban and rural areas. At the root of this conservation planning trend is a growing appreciation for "hybrid" nature that is valued as natural in spite of the past or present influences upon it. In light of these ideological shifts in the ways that Canadians value and in turn manage nature, is there a corresponding change in the ways that conservation activists perceive nature and evaluate naturalness?

Background: Early Wilderness Conservation in Canada

In early North American nature conservation in North America, parks were created to protect economically valuable resources from private exploitation. The establishment of early protected areas like Yellowstone National Park in the United States and Banff National Park in Canada was intended to secure potential revenue from tourism and timber as well as to ensure public access to sites of great scenic beauty (MacEachern 1995; Foster 1998). Merchant (1992) suggests that in an effort to assuage guilt about exploitation of nature in the 19th and 20th century, the North American environmental movement overcompensated by attempting to conquer remaining pristine nature in the

form of exclusionary protected areas. So began a great trend of establishing protected areas far away from civilization. These sites were valued for their fundamental wildness and idealized as pristine nature that had escaped the de-naturalizing effects of human influence (Foster 1998; Cronon 1995). For the most part, landscapes deemed worthy of protection represented a particular aesthetic that was popular at the time, including forests, mountains, lakes, rivers, and dramatic geological features like canyons (McElhinny 2004). Less "sublime" environments like wetlands and grasslands were left off the conservation agenda for decades (Cronon 1995; Pyne 1998). In Canada, the approach to conservation has been to protect large pieces of what are believed to be untouched wilderness areas (Lister and Kay 2000; Wallington et al. 2005). Ecological research has focused primarily on these remote areas, and often examines the negative effects of human influence (Tomalty 2009). Similarly, human interaction with wilderness and all other forms of nature is often characterized as a disturbance or external environmental threat (Head and Muir 2006).

Hybrid Nature

In recent years, however, there has been renewed attention to the idea that humans can exist as part of the natural community rather than in opposition to it, and that nature that has been influenced by humans is not necessarily tainted. This is not a new idea: in his book, *A Sand County Almanac,* published in 1949, Aldo Leopold argued that humans should exist as part of the ecological community as part of an environmental ethic, and the goal of co-habitation with nature has been a principle of many cultures and aboriginal groups for centuries. This concept has re-emerged, however, alongside critiques of the concept of wilderness and idealizations of pristine nature. In a classic argument, Cronon

(1995) identified wilderness as a misguided cultural construct that idealizes separation between nature and culture through the belief in a fictional pristine environment that has somehow escaped human influence:

> "Wilderness is the natural, unfallen antithesis of an unnatural civilization that has lost its soul. It is a place of freedom in which we can recover the true selves we have lost to the corrupting influences of our artificial lives….But the trouble with wilderness is that it quietly expresses and reproduces the very values its devotees seek to reject. The flight from history that is very nearly the core of wilderness represents the false hope of an escape from responsibility, the illusion that we can somehow wipe clean the slate of our past and return to the *tabula rasa* that supposedly existed before we began to leave our marks on the world (Cronon 1995, 10)."

In this argument, by failing to recognize the reality of these marks on the world, "we embrace the false hope that it is possible to escape from responsibility for what we have done (Light 2010, p. 142)."Similarly, Takacs (1996, p. 42) echoes Cronon's argument by suggesting that planning conservation around wilderness is short-sighted, because "when we prize only the pristine, we establish a dichotomy in which we preserve a small amount of undefiled nature while leaving the rest open for any and all to despoil."

In response to this argument, critics propose that we eliminate the stigma against humanized nature and dismiss the preference for pristine or untouched environments. Cronon (1995; 2000) seeks a way to exist and work with nature rather than as opponents to it. Head and Muir suggest that "humans will need to be re-imagined and co-opted as active co-constructors of ….nature rather than solely as threats to it (2006, p. 90)."

Newman and Dale (2009) argue for the importance of "mundane nature," the fragments of remaining greenspace in urban and peri-urban areas that can often provide the most significant source of human-nature interaction. Dearborn and Kark (2010) suggest that close-proximity urban nature facilitates the development of an environmental ethic because the positive effects of conservation efforts can be viewed and appreciated more readily. Or as Leopold (1949, ix) put it, "we abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect."

In effect, embracing societies as a part of the natural community rejects the perception that nature and culture can and should be separate, instead recognizing a nature-culture hybrid[1]. As Zimmerer (2000, 356) notes, these "nature-society couplings" are increasingly the subject of conservation management schemes like the United Nations Educational Scientific and Cultural Organization (UNESCO) Man and the Biosphere program, the Biosphere Reserve program, and private land conservation initiatives like stewardship and conservation easements.[2]

Hybrid Landscapes and Conservation Planning

Inseparable from these calls in defence of humanized nature is the reality of continuous expansion of urbanization and subsequent fragmentation of natural areas. A number of

[1]Throughout this thesis, I will refer to such hybrid nature, though sometimes referring to it in other ways such as a nature-society couplings, or humanized nature.

[2] Like the concept of "sustainable development," however, stewardship programs have been critiqued as driven by economic and political constraints and subject to "greenwashing" and "green romanticism" (Poncelet 2001, 283). Stewardship and other forms of conservation on private lands have also been critiqued as neoliberal forms of governance which commodify and restrict access to nature (for a discussion of these critiques in the context of the Oak Ridges Moraine, see Logan and Wekerle 2008 and Sandberg and Wekerle 2009).

protected areas exist throughout Canada and Ontario to preserve ecologically significant natural features. What remains is a patchwork of urban and rural settlements with an occasional piece of greenspace; this landscape is what Bocking (2009) describes as a "jumble of fields, forests, lakes and buildings." In this type of landscape, protecting remaining natural areas involves "placing the conservation reserves firmly within the context of the surrounding landscape" because this "seems to be the only way to ensure the long term viability of remnant areas (Saunders et al. 1991, 26)." Considering the larger landscape context enables a composite view of entire ecological regions, including the ecological processes that take place within and between cities, towns, rural areas and greenspaces (Tomalty 2009). Considering the interconnectedness between social and ecological systems is a core concept of the "ecosystem approach," a resource management strategy that "places humans within and dependent on the functioning ecosystem rather than apart and independent from the natural system" (MacKenzie 1996, 6)." What results is a strategy for managing social and ecological systems by considering their multiple interactions at different scales. In this way, conservation is less a process of protecting nature and more a strategy of integrating ecological considerations into the ways that communities are structured and managed (Waltner-Toews et al. 2008).

While they may not directly engage with the body of literature around managing for complex socio-ecological systems, provincial and municipal governments are beginning to adopt a landscape-scale approach by planning for remaining rural and natural areas in ways that restrict urban development; where these were once seen as "future urban," governments are beginning to consider alternate options for these lands and to recognize their ecological value (Pond 2009). In this way, conservation in Ontario

is increasingly part of a process of land use planning, where citizens and governments find value and construct meaning for "what's left" rather than beginning with considerations for "what's worth protecting" (Bocking 2005; McElhinny 2006). Conservation has traditionally involved more attention to the biological rather than social or managerial dimensions of the environment (Gaston et al. 2005). In contrast, when approached as part of the planning process or in response to the issue of urban expansion, conservation becomes a wholly social process because the identity of landscapes is culturally determined (Cosgrove 1984; Duncan and Duncan 2004). Hull et al. (2001, p. 327) describe landscapes as "symbolic environments used by people to define themselves," and as a result the process of defining what constitutes a particular landscape is a contested forum of social construction. In particular, land use planning often becomes a forum for articulating particular landscape identities and management values. This is an ongoing discursive process, and as such the ways landscapes are defined are fluid and never static (Hirsch and O'Hanlon 1995; Hurley and Walker 2004). As a result, the decisions which emerge from planning processes in turn can be understood as the physical embodiment of values and landscape identities (Daugstad et al. 2006).

If landscapes are sites of constantly evolving cultural construction, then examining the discourses surrounding landscapes is a rich venue for exploring perspectives of nature. Duncan and Duncan (2004) explain how it is possible to "read" a landscape by pulling out themes and subtexts from the ways that communities and individuals describe and relate to them. More specifically, the conservation planning process is the site of "discursive acts" where "the meanings and relations of the natural

environment" take place (Taylor, forthcoming), where issues are defined, and where major decisions are made (Whatmore and Boucher 1993; Hurley and Walker 2004). As active contributors to these planning process conservation activists are participants in the processes of defining landscapes and assigning value to them. As a result, the discourses of "engaged citizens" (Lach et al. 2003) illustrate how they conceptualize their role within the planning process as well as how their valuation of nature interacts with different ways of defining and constructing specific landscapes (e.g., Hurley and Walker 2004).

Case Study: the Oak Ridges Moraine

The Oak Ridges Moraine (ORM) is a protected area that is a particularly rich venue for exploring valuation and perception of hybrid landscapes in an activist discourse. The Moraine is a large glacial landform, a ridge of land which runs 160 kilometres across the top of Toronto and parallel to Lake Ontario. Far from being a wilderness landscape, the Moraine is an assortment of municipal forests, agricultural fields, and other assorted greenspaces that have escaped urban development. In the face of ever-expanding urban boundaries of cities and towns in the Greater Toronto area and growing concerns about urban sprawl and unsustainable lifestyles, concerned citizens began to speak up about protecting the Moraine. Interest in the movement grew, resulting in a provincial planning process that legislated protection of the landform in 2001 with the ORM Act. A decade later, a body of Moraine activists remain vigilant watchdogs of government and the development industry and are suspicious that demand for urbanization will eventually overturn the Moraine's protective policies.

By analyzing the discourse of citizens who are engaged in advocating for the conservation of a particular protected area – the Oak Ridges Moraine (ORM) – this study will explore how different ways of framing the landscape are connected to engaged citizens' values and perspectives towards nature; in particular, this study will explore how respondents perceive the naturalness of the landform. As an example of a nature-culture hybrid landscape, the ORM presents an excellent opportunity to study perception of a non-pristine landscape as expressed through the discourse of a group who value the Moraine as a natural area.

Literature Review

Introduction

The idea of nature is complex and situated within a rich social context. While a growing body of literature suggests that nature is a social construction, it is more 'constructive' to consider the ways that individuals and societies perceive nature and how this perception affects human-nature interactions (Brunson 2000; Hull et al. 2001). In particular, invasive species and ecological restoration are excellent topic areas for exploring how concepts of nature and naturalness are socially dependent and the challenges that this dependency raises in conservation and resource management contexts.

Putting the "Constructive" into Constructivism

Nature is "perhaps the most complex word in the English language" (Williams 1980, 219). It is complex due to its social entanglements; the ways that nature is defined depend on the persons who are defining it, their cultural paradigms, their values, and their personal preferences. Scholars primarily from the disciplines of geography, philosophy, and environmental studies have identified a variety of ways that humans perceive and understand nature (Cronon 1995; Brunson 2000; Castree 2001; Demerritt 2001). In most cases, nature is understood in relation to its connection or disconnection from humanity: it is a conceptual other that is seen as existing independently from human influence. This conceptual divide is referred to as the nature-culture dichotomy.

While academics may theorize about the fundamental inseparability between nature and culture or identify it in various environmental discourses, others argue that the

nature-culture dichotomy is not a practical or relevant way of understanding the relationship between nature and human society (Daugstad et al. 2006). As Castree (2004) argued: "the Baroque jargon of academia may confidently declare that there never was a Maginot line dividing natural things from social things. But in several walks of life people continue to speak and act as though such a divide were self-evident (Castree 2004)." Rather than a clearly defined divide, the distinction between nature and culture is more of a gradient or continuum from untouched nature to a cultural or urban landscape (Daugstad et al 2006). Scholarly attempts to reconcile the nature-culture divide at the landscape scale have resulted in the concept of hybridity in landscapes and in human-nature interactions, where natural and social processes are identified as coupled and interconnected as part of the same ecological system (Zimmerer 2000; Jeffery and McIntosh 2006; Walker and Salt 2006).

Because people perceive the same landscape in different ways, nature can be understood as a social construction (Bird 1987; Cronon 1995; Escobar 1999; Brunson 2000; Castree 2001; Demerritt 2001). This does not mean that the physical natural world does not exist, but that "the way we describe and understand that world is so entangled with our own values and assumptions that the two can never be fully separated (Cronon 1995, 25)." Proctor (2001) explains that the idea of social constructivism is most relevant as a reminder that "any descriptive or normative pronouncement people make on nature is never innocent of its human origins. There certainly is a nature 'out there,' but we cannot say anything more about it without relying on human modes of perception, invoking human conceptual needs and desires – in short, when we speak of nature we speak of culture (Proctor 2001, p. 229).

The same scholars who suggest that nature is socially constructed also caution that it can lead to relativism: if environmental problems like global warming and species extinction can be construed as mere figments of the social imagination, then there is little cause to do anything about them (Cronon 1995; Castree 2001; Proctor 2001; Demeritt 2002). In addition, if scholars remain too critical about the persistence of the nature-culture divide without considering the views and values of the public and resource managers, ideas about "social nature" (Braun and Castree 2001) will fail to contribute anything helpful in resolving environmental problems (Foster 2010). Similarly, approaching the study of human-nature interactions from a "crudely constructivist" standpoint, scholars miss an opportunity to explore the nuanced and value-based social associations with nature which can often provide the greatest insights (Whatmore 2002). In response to these criticisms, Hull (2000) and Demeritt (2001) argue that it's time to put the 'constructive' into constructivism, using the theory as a bridge rather than a barrier to the planning and management of natural areas.

With cautions against relativism and reminders to be constructive in mind, much can be learned from examining the ways that individuals and societies perceive nature and in particular how these perceptions influence human interactions with nature. In a number of studies from the past decade, researchers demonstrate how the concepts that individuals use to describe nature or natural phenomena are widely varied and subjective. For example, Fischer and van der Wal (2007) found that citizens in a Scottish case study were more concerned with balance and naturalness than distinctions between native and invasive species, and Hull et al. (2001) found that citizens considered health, wildness and authenticity to be the most important criteria measuring naturalness. Similarly,

studies from the Netherlands have analyzed visions of nature, which are conceptualized through a combination of values, beliefs and perceptions (e.g. Buijs 2009; Van den Born et al 2001). In these studies, respondents indirectly engaged with the nature-culture dichotomy by exploring their perception of the degree to which human-induced disturbance to nature has reduced its natural qualities, and the ways in which specific actions might make it more natural again. In this way, exploring concepts like naturalness can act as a bridge to exploring the nature-culture dichotomy. These concepts can, in turn, be used very specifically to guide the practical business of managing and interacting with nature and aid in understanding the social issues embedded in environmental problems (Braun and Castree 2001).

Invasive Species as a Foil to Naturalness

Invasive species are a conceptual quagmire, existing between the definitions of what belongs in nature and what does not, essentially acting as a conceptual foil to the idea of nature (Head and Muir 2006). Many studies relating to naturalness or the degree of purity of nature invoke invasive species as a conceptual foil to nature (eg. Woods and Moriarty 2001; Robbins 2004; Lein 2005; Fischer and van der Wal 2007; Larson 2007). By examining the social issues related to invasive species, a growing body of literature explores the conceptual issues that emerge when defining what is natural (eg. Foster and Sandberg 2004; Robbins 2004; Fischer and van der Wal 2007; Larson 2007; Knights 2008). The term invasive species is subjective and variable (Colautti and MacIsaac 2004). Accordingly, just as the concept of naturalness can be used to explore perception of the distinction between nature and culture, examining different definitions of invasive species can shed light on the ways that individuals and societies characterize

unnaturalness or “non-nature” (Lien 2005). Similarly, just as naturalness is a subjective and variable term, so is “invasive species.”

While some scientists define invasive species in reference to very specific ecological effects, even in scientific contexts there are many varied meanings behind the term and its many forms, including exotic, introduced, alien, foreign and non-native (Colautti and MacIsaac 2004; Lockwood et al. 2007). In most definitions from scientists and governing bodies, however, invasive species are characterized as originating from elsewhere and causing some kind of harm. For example, the Government of Canada (2009) presents the following definition: “Invasive species are plants, animals, aquatic life and micro-organisms that outcompete native species when introduced outside of their natural environment and threaten Canada's ecosystems, economy and society.” While this definition appears to be straightforward, it contains three highly loaded assumptions: that invasive species threaten native species, and thereby implies a preference for native species; that invasive species are introduced or originating from elsewhere; and that invasive species pose a social and economic threat. In an American example, the U.S. Department of Agriculture’s National Invasive Species Information Center (2009) suggests that invasive species are: “non-native (or alien) to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health.” Again, invasive species are identified as originating from elsewhere and causing harm to the environment, economy, and in this case, even human health. These assumptions embedded in definitions of invasive species raise a number of questions.

If invasive species are defined in relation to the harm they cause, how is this negative effect measured, and by whom? The ecological impacts of invasive species are well-documented (eg. Mack et al 2000; Lodge et al 2006), but outside of extreme cases such as in island environments (Robbins 2004), it can be difficult or impossible to pinpoint negative ecological effects from invasive species. Except in the most extreme scenarios, the effects of invasive species are dwarfed by the more systemic ecological effects caused by humans. While invasive species are most frequently referred to in a negative context (especially in the field of conservation biology (Peretti 1998), they can also provide social and ecological benefits. For example, Kirkham (2004) describes a case study in Samoa where local officials and policy makers identified a particular plant as invasive and non-native and sought to control it, while local farmers did not find it to be invasive due to its medicinal and shade-providing properties. In addition, invasive species can provide important ecological functions, particularly in disturbed environments where native plants cannot survive (Foster and Sandberg 2005). Some invasive species have economic uses (Kendle and Rose 2000), to the extent that for every case of invasion, some sector of society makes a profit (Baskin 2002). Invasive species can also be socially important as a valued form of nature. For example, people can value the habitat, aesthetic, and recreational features associated with a landscape, even one that is dominated by invasive species (Foster and Sandberg 2005). In many cases, invasive species are the only connection that people have to nature, and their invasiveness does not reduce the importance of this interaction (Lister 2008; Newman and Dale 2009). Because ecological and social harm are not objective categories for evaluating the

negative effects of invasive species, perception of "harm caused by invasive species is a function of human values (Larson 2007, p. 994)."

Because invasive species are identified as originating from outside the natural system, they are perceived as an externality that does not belong and that, in many cases, reduces naturalness. Invasive species are identified as originating from elsewhere and posing a threat to native plants, yet there are rarely clear definitions between what is native and what is not. Some invasive species are known to be exotic, particularly where deliberate or accidental introductions were documented (Lockwood et al. 2007). However, in most cases it is extremely difficult to identify whether a species is native or non-native. Woods and Moriarty (2001) identify that all existing criteria for evaluating defining nativeness and invasiveness are flawed in some way. For example how long does a species need to be established before it is considered to be native (Peretti 1998; Woods and Moriarty 2001)? It is also conceptually challenging to distinguish between native and non-native species because it implies that certain species belong to and have always existed within certain environments. In addition, framing certain species as 'invaders' suggests that there is static and definable form of nature that is being 'invaded'; in this way, preference for native or "original" species reveals both a preference for pristine nature and a hesitancy to accept the hybridity of socio-ecological systems (Larson 2007).

In light of the challenges of categorizing species as native or invasive, Woods and Moriarty (2001) suggest that the concepts of native and exotic function more like "cluster concepts," where criteria can be used to attempt to categorize the species, but not all

invasive species will necessarily meet all criteria, and fitting under one or several of the criteria will not be sufficient to classify a species clearly as invasive. In this way, invasiveness is defined according to both social and ecological context. Similarly, Colautti and MacIsaac (2004) argue that invasions should be understood as biogeographical rather than taxonomic phenomena. Others argue that because the concept of invasive species is socially constructed, it is more relevant to consider invasions as social phenomena. Robbins (2004) suggests that species become invasive through political processes and networks of both social and biological actors, and Knights (2008) suggests that it is most relevant to define nativeness in terms of their cultural associations. Due to the difficulties of delineating between native and invasive species, it is more relevant to consider the social processes through which species become culturally invasive, and how this affects how individuals and societies perceive and interact with these species (Robbins 2004; Larson 2007). In this way, invasiveness is a culturally constructed concept, and species are identified as culturally native in the same way that disturbed or hybrid environments can be defined as culturally natural (Hull et al. 2001). Exploring social perceptions of invasive species in hybrid environments can contribute to understandings of how individuals interact with the concept of naturalness in hybrid environments – in this case, this theme can be explored by examining whether invasive species are perceived as reducing naturalness and posing a threat to authentic nature, or whether they can become culturally native and coexist as a valued part of nature (Foster and Sandberg 2005).

Restoration as a Means to Naturalness

Restoration is a process of deliberate re-naturalization to repair disturbance and improve the ecological condition of natural systems (Gobster 2000). Because restoration is an attempt to return to a specific conception of nature, it involves distinguishing what is natural and what is not, and adding and removing specific elements according to whether they are identified as contributing to or reducing naturalness. In most restoration projects, invasive species are identified as a source of disturbance and are targeted for eradication. In fact, in some projects, removal of invasive species is the sole motivator for and goal of the project. Restoration involves making value judgements about what is considered to be worthy of restoring and which species and ecosystems are believed to be most authentic (Woolley and McGinnis 2000; Clewell and Aronson; 2006; Trigger et al 2008). In this way, restoration is a process of applying values to the physical landscape, resulting in physical constructions of social concepts and preferences. Exploring how individuals and stakeholder groups believe restoration should occur and what type of nature it is intended to restore can reveal "a deeper set of values related to the meaning of nature (Gobster 2000, p. 10)."These values can vary even among individuals and groups who share the same nature conservation goals (Gobster and Barro 2000).

Broadly, Jordan (2000) suggests that North American views toward restoration are variations on two contradictory perspectives which mirror the nature-culture divide: that restoring nature is the only way to reconcile humans as part of the community of nature, as advocated by Aldo Leopold and John Muir; and that nature is or should be separated from humans because humans compromise the wildness of nature (Gobster 2000; Katz 2000). As Katz (2000) identifies, the latter perspective falls into the

constructivist trap by implying that a restoration project *could* be free of human influence; any human-designed restoration project will result in a cultural artefact which represents the values and desires of those who designed it. The suggestion that restoration can be a process of re-naturalization is "the big lie" which ultimately results in humanization of landscapes (Katz 2000, 389). "Managing nature," then, becomes an oxymoron and a paradox because the human interference involved in managing environments to increase naturalness ultimately reduces the wildness of the same environments (Brunson 2000; Landres et al. 2000).

However, while restoration may result in physical processes of construction, this does not mean that they are without merit. Light (2000) critiques Katz's purely philosophical dismissal of these efforts because, once again, emphasis on the nature-culture dichotomy neglects practical issues of nature conservation; human-derived restoration processes will likely have some kind of net ecological benefit. Similarly, Jordan (2000) defends restoration as a bridging process between communities and nature which does not have to be a process of domestication. Because there is a phase of "letting go" at the end of the project, restoration can allow natural processes to take over and, eventually, increase the degree of naturalness of the area. Swart et al (2001) identify a similar strategy for restoration which is a deliberate process of re-naturalization of humanized landscapes. "Nature development" is described as a type of restoration which creates natural areas from non-natural land (like former agricultural fields); allowing these areas to evolve into natural areas which mimic what was once there before (p. 230). In this view, the degree of human influence is not as important as the processes of naturalization and allowing ecological processes to take their course. In a similar view,

Brunson (2000) suggested that naturalness can be understood as a gradient or "continuum that can be defined by the characteristics of its polar extremes, but generally existing in some middle ground that is best measured by comparisons rather than absolutes (p. 236)." Just as nature and culture are mutually dependent concepts, naturalness is not an "either-or" category that can be considered in isolation. Accordingly, Brunson (2000) suggests managing wildness as a continuum, making decisions according to limits of acceptable change rather than static conceptions of ideal nature.

While these discussions about restoration consider the paradox of deliberate human "re-wilding" (Dearborn and Kark 2010) of nature, it is important to note that the very idea of nature implies an ideal or authentic natural state, which, given enough time, human effort or ecological take-over, disturbed areas can return to. This process of re-naturalization aims to eliminate human influence on the landscape, reinforcing the idea that nature is or can be separate from culture. To investigate this issue, I turn to the case study of Oak Ridges Moraine.

Case Study: the Oak Ridges Moraine

Introduction

Located just north of Toronto, the Oak Ridges Moraine is a partially urbanized glacially-formed ridge of land that stretches 160 kilometres across one of Canada's most densely populated regions, between Caledon and Cobourg (Hanna and Webber 2010). It is a scenic stretch of rolling hills and kettle lakes, but it is also a landscape of extensive human use and development. Nearly all but the most hard-to-reach areas of the Moraine have been logged, cleared for agriculture, mined for gravel, or covered in subdivisions, villages and medium-sized cities that spread out from Toronto (Tole 2008). Despite this extensive development, activists have fought for two decades to save the Moraine from further urban development and aggregate extraction. A major focus of the conservation campaign was and continues to be the importance of the Moraine in proving water-related ecological services (Bocking 2005; McElhinny 2006; Whitelaw et al. 2008). Composed primarily of sand and gravel, the Moraine collects and filters large amounts of fresh water, and pushes this water back above ground as the headwater for over 65 rivers, lakes and streams. In an effort to communicate the importance of these services, activists have more recently labelled the Moraine the "rain barrel of Ontario," emphasizing the fact that it provides water for over 250,000 people (Bocking 2005; McElhinny 2006).

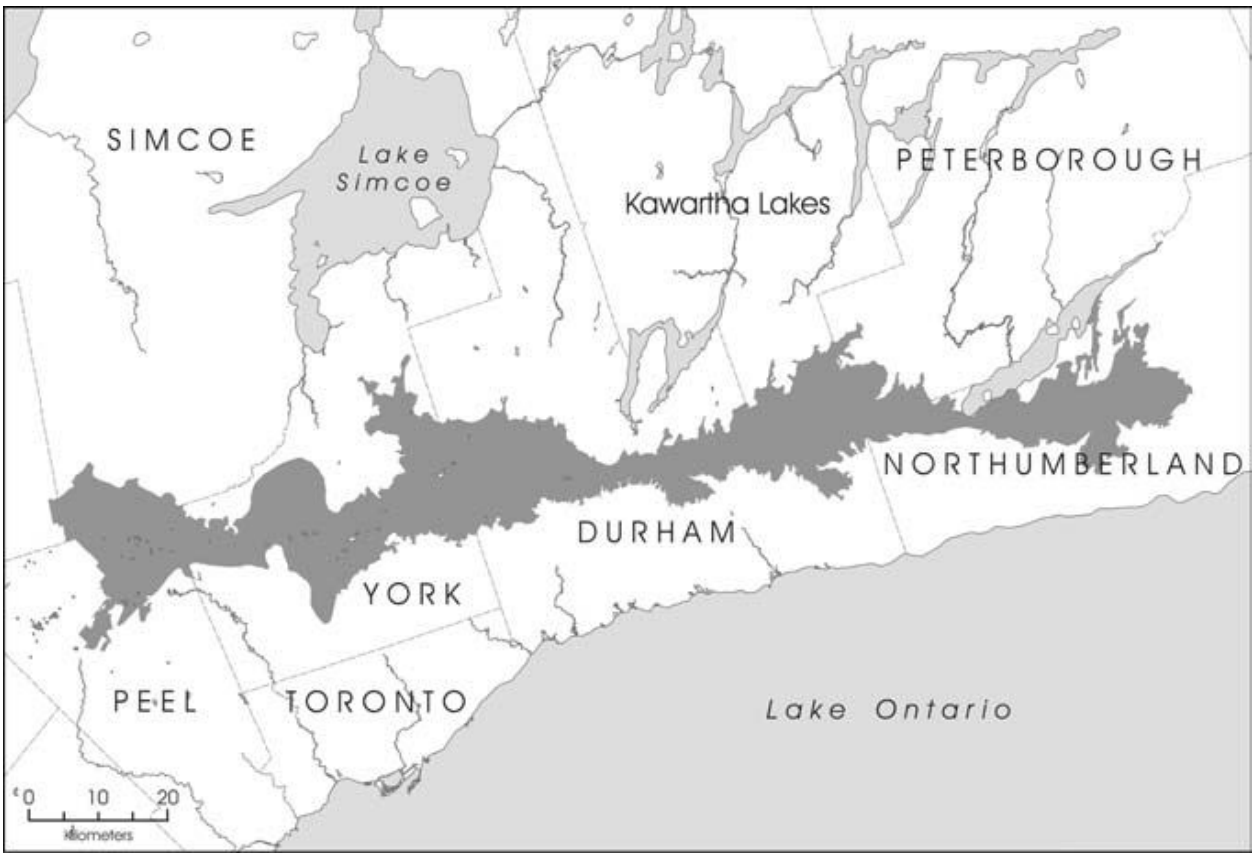

Figure 1 - The Oak Ridges Moraine (shaded in dark grey) in context with municipal boundaries. From Hanna and Webber (2010).

The Oak Ridges Moraine is unusually complex as a protected area due to its size, habitat variety, but most of all, the incredibly complex social landscape within it. The Moraine is more than the sum of its sand and gravel deposits; it is a landscape of intensive cultural production which is continually defined and redefined by the varying actors who have a stake in the way it is used and managed. All landscapes are sites of construction (Cosgrove 1984; Duncan and Duncan 2004), yet as a physically large and politically complex landform the Moraine is a particularly rich venue for exploring how the social construction of nature interacts with environmental policy and regional planning processes.

Social History of the Oak Ridges Moraine

In addition to being densely populated relative to conventional protected areas, the Moraine landform has experienced an extensive amount of alteration by humans. Aboriginal peoples deliberately burned the Moraine's once wide-ranging areas of tallgrass prairie, and much of the landform was logged and converted into agriculture during waves of European settlement, where the Moraine's sandy soils were quickly eroded. By the 1870's, enormous desert-like blowouts were common across the Moraine, and foresters began to call for extensive replanting. The process of reforestation began in the 1920's in County Forests across the Moraine, and occurred at a large scale in the Ganaraska watershed beginning in 1941 (Fisher and Alexander 1993; Whitelaw et al. 2008). This process of restoration marked a turning point in conservation in Ontario. Until this point, the paradigm of resource management was focused on single resources (timber, water, etc). Reforestation and subsequent establishment of conservation authorities according to watershed boundaries represented a shift to more holistic strategy of integrated resource management, which considered the larger scale of ecosystems and natural processes (Fisher and Alexander 1993).

The second major stage in the Moraine's history beginning in the late 1980's was the emergence of a widespread and enduring conservation movement to protect it (Whitelaw et al. 2008). The early conservation movement was characterized by dramatic demonstrations and messaging that evoked a sense of urgency about advancing urban development. Activists staged dramatic demonstrations to gain media attention and captivate the public, including a staging a funeral procession for species that would be displaced by development (McElhinny 2006) and chaining themselves to tree trunks in

the face of bulldozers (Gilbert et al. 2009). The importance of biodiversity (in particular both species and habitat diversity) was presented by activists as a major theme of the movement, and in particular Species at Risk like the Endangered Jefferson Salamander were frequently presented as flagship species in peril (Bocking 2005; McElhinny2004). Activists also drew and continue to draw heavily on the Moraine's role in collecting and filtering water. In particular, Whitelaw et al. (2008) identify the Save the Oak Ridges Moraine Coalition (STORM) as instrumental in setting the agenda for conservation and creating a vision for the Moraine due to involvement in several formative working groups and committees in the 1990s.

By invoking arguments for protecting the Moraine that were based on ecological and hydrological features, activists situated their arguments for protecting the landform within a scientific discourse as defined and legitimized by experts; Bocking (2005) suggests that framing the Moraine in this way provided legitimacy to the conservation movement; characterized the Moraine as fragile and vulnerable to the effects of urban development; and connected the localized issues of urban sprawl on the Moraine to larger, regional concerns about community planning and human health. McElhinny (2006) suggests that water was the only way to frame the importance of the Moraine, because the landform does not conform to existing discourses about what's worthy of conservation: aesthetically sublime landscapes and biodiverse remnants of pristine nature.

Regardless of the tactics behind different ways of framing the Moraine, the efforts of highly coordinated activists caught the attention of the media, the general public, and political decision-makers, and were certainly instrumental in the formal development of

conservation policy for the Moraine. In 2001, the Province announced the Oak Ridges Moraine Protection Act and the Oak Ridges Moraine Conservation Plan later in the same year (Government of Ontario 2002). The conservation vision as described in the Plan and as influenced by STORM and citizens engaged in Moraine conservation (Whitelaw et al. 2008) is:

> "A continuous band of green rolling hills that provides form and structure to south central Ontario, while protecting the ecological and hydrological features and functions that support the health and well-being of the Region's residents and ecosystems (Government of Ontario 2002)."

Since the enactment of this political conservation infrastructure, civil society groups like STORM have continued to advocate for the importance of the Moraine while at the same time participating in the implementation of the Plan through partnering with a stewardship body (the Oak Ridges Moraine Land Trust), monitoring programs (Citizens Environment Watch and Monitoring the Moraine), and the development of an extensive trail network (the Oak Ridges Trail) (Whitelaw et al. 2008; Hanna and Webber 2010).

As the political infrastructure of the Moraine conservation movement continues to evolve, so too do the discursive processes which are used to describe and define the landform, its most significant threats, and the reasons why it is worthy of conservation. Below, three dominant ways that the Moraine is framed in the discourse of engaged citizens will be briefly discussed: the Moraine as a land use planning issue; the importance of water; and the Moraine as connected to local communities and economies.

Urbanization and Sprawl: Framing the Moraine as a Land Use Planning Issue

The Province's approach to regulating use of the Moraine is situated firmly within the land use planning process. The Act was introduced by the Minister of Municipal Affairs and Housing, and the Act and Plan are identified as "key elements" of Ontario's Smart Growth strategy, which aims to promote and manage growth "in ways that build strong communities, sustain a strong economy and promote a healthy environment." Accordingly, the Province introduced land use planning tools as conservation measures to protect the Moraine. "Land Use Designations" divide the Moraine into four different zoning categories: Natural Core Areas, which protect key natural heritage features; Natural Linkage Areas, which maintain corridors of greenspace and along watercourses; Countryside Areas for maintaining agricultural lands and Rural Settlements; and Settlement Areas, representing the existing communities which are maintained under municipal jurisdiction (Government of Ontario 2002).

This political conservation infrastructure emphasizes landform-scale conservation, including greenspace corridors and large-scale ecological and hydrological systems and processes. The ORMCA is unique in this approach; in particular for the integration of both land and water within one piece of legislation which Bradford (2008) suggests is an effective model for large-scale conservation planning. The integration of land and water in the ORMCA represents an emerging "ecosystem-based" approach to planning where the larger-scale of interconnecting natural and social processes is considered (Hanna et al. 2007). In this approach, concepts like "landscape continuity" act as "guiding strategies focused on landscape structure, function and change (Foster 2010,

p. 168).”Hanna et al. (2007) suggest that the ORMCP was a departure from the traditional approach to planning in Ontario, due to integration of these ecosystem-based principles as well as the application of zoning designations as a strategy to regulate land use. Conservation measures for privately owned land on the Moraine represent a significant component of the Plan, as over 90 percent of the Moraine is privately owned (Logan and Wekerle 2008). The strategy of combining private property regulations with protection of core areas is an increasingly used top-down regional planning approach that is favoured by policy analysts (Filion 2001; Haughton and Counsell 2004; Wekerle et al. 2007). The implications of private property regulations will be discussed below.

This approach to planning may be a first for the Province of Ontario, but it appears to have originated in an early agenda set by the Moraine conservation movement. A paper published in 1993 by STORM co-founders John Fisher and Don Alexander discusses “planning for linear corridors” which bears strong similarities to the ecosystem-based planning concept and the method that the Province implemented for the Moraine nearly ten years later. Fisher and Alexander (1993) consider the possibility of connecting watersheds with land corridors as part of an integrated conservation framework:

> “As a linear corridor, and as a headwaters area, the Moraine poses some interesting planning challenges….Some have suggested that watershed planning might constitute the ‘skeleton’ of a land use/conservation planning framework, with the linear corridors serving as the ‘sinews’ binding the whole together. With the current ferment over the Oak Ridges Moraine raising questions about the utility of current planning in general, it would appear that the dialogue between

nature and humanity on the Oak Ridges Moraine may yet produce new breakthroughs in natural resources management (p.23)."

Whitelaw et al. (2008) suggest that STORM's concept of a connected regional plan directly influenced the Province's approach to the landform because the organization met with MPP Ron Kanter while he was developing a regional greenlands strategy. Even in the early days of the conservation movement, Moraine activists were considering practical solutions to the challenges of protecting the landform within a complex socio-ecological region. As a result of this political savvy, activists framed conservation of the Moraine as a land use planning process necessitated by urban sprawl. Conservation has always been a land use planning process to some degree, because the establishment of all protected areas essentially involves setting aside and designating lands for conservation; however despite value-driven motivations for protecting the Moraine, activists situated their conservation vision for the landform within the land use planning process.

Activists emphasized the importance of water and watershed planning (discussed in more detail below), as well as the presence of expert-defined ecologically significant features (like water and Endangered Species) (Gilbert et al 2009). In this way, activists and organizations like STORM engaged with scientific-managerial issues rather than value-driven emotional arguments for protecting the Moraine (Bocking 2005; Gilbert et al 2009). Hanna and Webber (2010) argue that since concerns about urban sprawl and development were catalysts for the Moraine movement, it can be expected that the approach to conservation evolved in the context of a land-use planning process.

Regardless of how or why this emphasis evolved, it continues to shape how engaged individuals and organizations frame Oak Ridges Moraine conservation.

In particular, in the face of continued demand for urban development and economic activities on the landscape, Moraine organizations have shifted to a focus on monitoring the implementation of and adherence to the Act. For example, at the Stewardship, Livelihoods and Learning conference near Peterborough in spring 2008, STORM Executive Director Debbe Crandall urged attendees to stay involved and stay vigilant about protecting the Moraine, explaining that the enactment of the ORMCA was a victory but was "only the beginning" of a long-term conservation plan for the Moraine; that policies are not permanent and that the fight to protect the Moraine was far from over. This line of thinking is reflected in the Monitoring the Moraine (MTM) project, which is a joint initiative between STORM, Citizens Environment Watch and the Center for Community Mapping. As a community-based monitoring project, MTM aims to evaluate the effectiveness of the ORMCA in ensuring Moraine conservation while acting as a watchdog for municipalities and the Provincial government. Echoing Crandall's call for continued engagement, a description of the project on the MTM website urges:

> "The ORMCP, like any regulation, is only as strong as the will of people to implement it. The future health of the moraine will not rest solely with the provincial or municipal governments; residents and other interested parties must also be involved. People living on the moraine, and those in neighbouring urban centers, must work together to ensure that the ORMCP is not only adhered to, but that it is also effective and remains relevant over time (Monitoring the Moraine 2007)."

While a distinct tone of activism remains in this call-to-action, the purposes and goals of the movement are shifting away from gaining public and political support for the need to protect the Moraine and toward a watchdog role of monitoring and policy evaluation. These monitoring and evaluation functions are growing in anticipation of the official review of the ORMCP, which is currently scheduled for 2015. As a result of these changes, the ways that activists communicate the identity of the Moraine are also changing. Where once the movement was focused on drawing attention to the fact that the Moraine existed and touting its ecological virtues, the Moraine is now being framed or marketed as a landform or bioregion which provides larger-scale ecological services.

Significant critiques have been levied against the Moraine conservation policies, however, on the grounds that they reinforce inequality and advance growth agendas. Wekerle et al. (2007) identified both pro-growth and pro-conservation discourses in the ORMCP, Greenbelt Plan and Places to Grow Plan, and argue that these planning strategies use the goal of nature conservation to "legitimate, fabricate and lubricate specific state policies related to growth and its management (p. 23)."

Logan and Wekerle (2008) suggest that the ORMCP represents a neoliberal form of environmental governance because it commodifies the landform and provides disproportionate benefits to wealthy rural estate owners through tax breaks and conservation easements on private lands. Sandberg and Wekerle (2009) further describe neoliberalization on the Moraine as a process of rural gentrification, where agricultural lands are transformed from a productivist to a consumptivist landscape. In this conservation model, public access to protected lands is restricted while landowners enjoy

increased property and amenity values as a result of Moraine legislation (Sandberg and Wekerle 2009).

As 90 percent of the Moraine is privately owned (Logan and Wekerle 2008), consideration of the implications of private land conservation is certainly worthwhile. However it is not clear that the phenomenon described above is occurring across the entire landform. The majority of Moraine protected lands are classified as agricultural (Hanna and Webber 2010); that is, while they may be privately owned and not open for public use, these lands are under production as agricultural businesses and are not occupied by elite, consumptivist estate residents. In addition, Sandberg and Wekerle (2008) describe the Moraine private land conservation policies as if they are a form of enclosure; however, true enclosure processes involve displacing residents and creating a fortress-style protected area where they once lived and worked. Enclosure on the Moraine would involve displacing rural landowners and preventing productive activities. On the contrary, the ORMCP restricts allowable land uses and thereby provides a measure of conservation private lands, in particular by preventing private properties from being subdivided and converted into suburban housing. While it's true that public access is limited on these private lands, they were privately owned before enactment of the ORMCP and not as a response to the legislation. However, the critiques raised above are particularly relevant in terms of how conservation agendas can be appropriated for personal or organizational gain: whether by twinning conservation goals with pro-growth agendas (Wekerle et al. 2007); or by commodifying the Moraine to market real estate and increase property values.

Keeping a 'Lid' off the Rain Barrel: Framing the Moraine in Terms of Water

Water is a key source of conservation value on the Moraine. Protecting the Moraine's water-related ecological functions is cited as a key priority by activists, and is explicitly discussed in the ORMCP as well as the ORMCA, which mandated the creation of municipal watershed plans. Because water is valued as a public good, framing the Moraine as the "rain barrel of Ontario" generated broad public support for conservation. Fisher et al (1991) indicate that framing the Moraine as a landform in terms of its hydrological features was strategic because it encouraged conservation efforts to capture the entire landform. By deliberately framing the Moraine in this way, conservation would necessarily involve protecting the ecological functions and processes which are connected to its hydrological features; no other focus could unite conservation in such a large, socially and politically complex area. Bocking (2005) suggests that presenting scientific arguments about the importance of hydrologic and geologic features was a strategy to increase the legitimacy of activists' arguments to protect the Moraine.

McElhinny (2004, p. 138) further explains how framing the Moraine in terms of its hydrological features was the most "viable and effective conservation discourse for conservationists," due to its unconventional aesthetic appeal and relative absence of significant biological diversity[3]. The most distinctive aesthetic features of the Moraine include kettle lakes, hummocks, and a series of rolling hills that are an unusual feature

[3] Species at Risk (including the Jefferson Salamander and Red-sided Dace) *do* exist on the Moraine and *were* used to mobilize support for the conservation movement. However, amphibians and fish lack the public appeal of "charismatic megafauna" like polar bears, pandas, and other large mammals, and as McElhinny suggests, failed to engage the public in a significant way.

for the region. However, these glacial features that are not immediately identifiable by the general public, and while the elevation of the Moraine is unusually high, it does not conform to the existing aesthetic frame of reference for "sublime" geologic features like mountains, canyons and river valleys.[4] In the absence of existing aesthetic frames for appreciating these features, activists were essentially required to invent a new conservation discourse around the Moraine's water-related services.

STORM co-founder John Fisher explained that branding the Moraine as the "rain barrel of Ontario" emerged out of the first Moraine conservation meetings, back when STORM consisted of a handful of concerned residents and graduate students from Trent University (J. Fisher, personal communication, 2010). Fisher created a watershed map of the Moraine which remains heavily used by STORM in advocating for the importance of water on the Moraine: the map clearly demonstrates the volume of rivers and streams on the Moraine, emphasizing the linkages between water bodies and between watersheds. As McElhinny (2006) suggests, because various maps of the Moraine emphasize different features (political boundaries, watersheds or elevation, for example), these maps can be understood as physical representations of how the Moraine landscape is socially constructed. Before the Moraine was the subject of conservation and political interest, it did not appear on many maps of Ontario, few were aware that it existed.

4 In making this point, McElhinny draws on a fascinating book by Pyne (1998), which explains how the Grand Canyon was not valued as a "sublime" aesthetic feature until developments in the fields of geology and biology created a frame of reference for appreciating it. Pyne reinforces the idea that the aesthetics for what is beautiful and awe-inspiring in nature is culturally constructed, much like Cronon's (1996) anecdote of travellers pulling down the window shades of their coaches while passing through the Swiss Alps to conceal what was then considered a hideous landscape.

By emphasizing how the geology of the Moraine contributes to its hydrological functions, activists constructed an identity for the landform and framed its importance in terms of water.

"Working Landscape": Framing the Moraine in Terms of Socio-economic Issues

Another emerging theme in the way that the Moraine is framed is its social and economic importance as a "working landscape." The Moraine is not presented as a site for "fortress-style" conservation, where nature is protected in isolation of human influence. Instead, the working landscape model is a way of framing Moraine conservation as contributing to and existing in harmony with the socio-economic landscape. In this way, the conservation model is a representation of the concept of sustainability, where the three priorities of environment, economy and society are managed in consideration for each other.

To more firmly develop this model on the Moraine, STORM and the University of Waterloo nominated the Oak Ridges Moraine for a UNESCO Biosphere Reserve Designation, much like the Niagara Escarpment Biosphere Reserve. To assess and enhance community support for the Biosphere Reserve model, in the spring of 2009 STORM organized a "community well-being symposium" around the anthropocentric theme "Stewardship, Livelihoods and Learning." During the symposium proceedings, STORM Executive Director Debbe Crandall explained that the themes expressed in the title were very deliberately selected to echo the UNESCO Biosphere Reserve priorities of

reducing biodiversity loss, improving livelihoods, and enhancing social, economic and cultural conditions for environmental sustainability.

Accordingly, at the symposium there was much discussion about developing a sustainable resource economy on the Moraine, through nature-based tourism and the development of a regional agricultural niche market in particular. In her introductory address, Crandall emphasized the importance of viewing the Moraine through "a broadened" lens that incorporates environmental concerns but "that puts people and their livelihoods back into the picture." She identified the Moraine as "a working landscape and as a predominantly rural landscape with all kinds of people living and working here." Overall, Crandall argued for the importance of integrating social and economic concerns in Moraine conservation: "what we're interested in exploring is how all of us can protect and enhance the Moraine's assets in such a way that sustains the livelihoods of people on and off the Moraine."

The extent to which the ORCMP may be a process of gentrification on the same rural working landscapes deserves further exploration. More generally, the equitable distribution of costs and benefits as a result of conservation efforts is a consideration as the ORMCP review approaches in 2015 and if the UNESCO Biosphere Reserve designation is approved. Deliberate efforts to generate benefits for those who live and work in the rural landscape of the Moraine are a reaction to concerns about inequalities furthered by the ORMCP: that landowners should not be punished through restrictions on their private lands by "environmentalists" from elsewhere who decide that the Moraine is worth protecting. Regardless, by incorporating both social and environmental considerations, emphasis on the working landscape model suggests a shift in the

movement towards sustainability and an integration of conservation within the existing hybrid landscape.

Research Questions

Based on the preceding discussion, my thesis sought to answer the following research question: How do discourses of the Moraine movement engage with the concept of naturalness? Specifically, how do respondents perceive both the current and ideal state of naturalness on the Moraine, and how does this perception interact with conservation values?

Methods

An Introduction to Q Method

This project utilized Q Method. Q or "Quantum" Method is used in the social sciences to study human subjectivity, viewpoint, and perception. It is a method for studying participants' subjective perspectives from their own frames of reference. In this way, it allows participants to communicate on their own terms with minimal influence of the researcher on the data (Brown 1980; McKeown and Thomas 1988).

In traditional survey methodology (R Method), the variables are the survey questions and the subjects are the participants. In Q Method, the traditional survey method is inverted so that the participants are the variables and the statements that the participants sort are the subjects (Sickler et al 2006). In addition, while factor analysis used in R Method analyzes correlations between variables across a sample, Q Method analyzes correlations between *subjects* across a sample (Burns and Cheng 2007).

Q Method is particularly useful in conservation contexts, where stakeholder values are complex and subtly varied. By revealing the subtle ways in which stakeholders agree and disagree, Q Method can help conservation planners and managers see past what appear to be very divergent viewpoints and perceive a more subtle array of perspectives. Q Method has the capacity to re-frame these entrenched debates by allowing stakeholders to position themselves within their own factor groupings. For example, in a Q study by van Eeten (2000), perspectives for and against an airport expansion in Amsterdam were found to be much more varied than the entrenched "for" and "against" arguments, and

stakeholders were unexpectedly found to agree on several points, building bridges between two apparently divergent interest groups.

In Q Method, participants sort statements relating to a particular topic according to their agreement or disagreement with them. The researcher selects the statements from a "concourse" which is intended to represent the range of potential perspectives on a particular topic. In most Q studies, statements originate from either interviews or from secondary sources like the media or government reports (e.g. Vogel and Lowham 2007; Sexton et al 2008). A structured process utilizing a coding matrix aids the researcher in selecting statements that are most representative of the study concourse, as will be explained below.

Participants conduct the "Q sort" by arranging the statements within a standardized grid according to their agreement with them (McKeown and Thomas 1988; Webler et al. 2009). Printed on the cards are the same statements that were selected during the creation of the sampling matrix. Each column within the grid is assigned a unique value, generally between -5 and +5. Participants indicate their strong disagreement with a statement by placing it in the -5 column, and conversely indicate their strong agreement with a statement by placing it in the +5 column. In between these extremes is a gradient between disagreement and agreement, with a 'neutral' column, represented by the number 0, in the middle (Swedeen 2006; Vogel and Lowham 2007). The researcher controls how many statements the participant can sort into each category, forcing the participant to make very explicit judgments about which statements they agree and disagree with, and ranking them accordingly. There are generally fewest opportunities to indicate strong disagreement or agreement, and most opportunities to

indicate a neutral emotion towards the statement. For example in the Q sort grid in Figure 2, below, participants can strongly disagree (-5) with two statements and have a neutral opinion (0) about six statements. The same pattern is repeated on the opposite "agreement" side. In this way, participants are forced to make decisions about which statements they feel most strongly about.

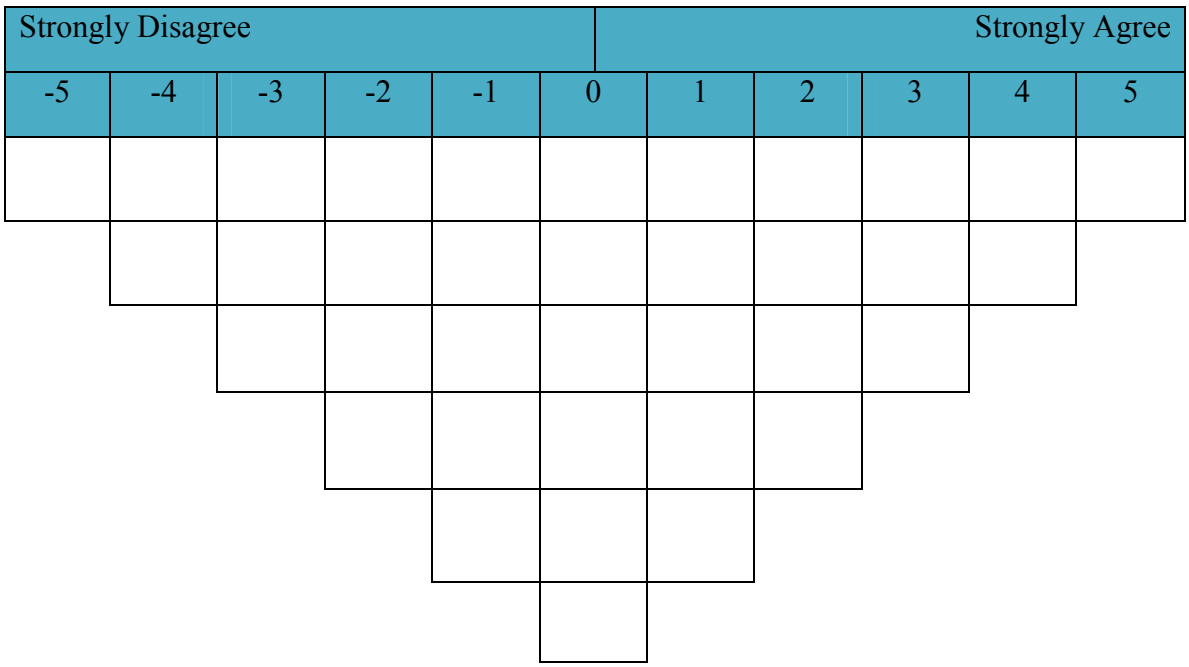

Figure 2 - A sample Q grid. In Q Method, participants arrange statements according to strong agreement (5) and strong disagreement (-5).

It is not the purpose of Q to have a demographically balanced group because Q studies are "not meant to create generalizations across populations," but rather act as case studies with results applying to one case (Burns and Cheng 2007, p. 250). As a result, a relatively small sample size can be utilized to explore the perspectives of a specific study population. Once an appropriate number of participants have completed the Q sort process, a factor analysis is conducted on the data to identify factor groupings within the study population. During this process a dependency factor analysis is conducted to cluster

Q sorts by common themes, so that individual viewpoints are reduced to a few shared ways of thinking (Sickler et al 2006; Swedeen 2006; Burns and Cheng 2007). These factor groupings are then analyzed in the context of the study topic.

Q Method in this Study

Interviews

In Q Method, statements representing the views of the study population are collected during interviews or from secondary sources (such as media records or other published information). Data collected during this stage is meant to represent the concourse on the subject, which is a representation of all potential views on a topic as held by a specific study population (Brown 1980). That is, "to ensure that the final Q sample represents the concourse accurately (Webler et al. 2009, 14)." As a result, the number of interviews conducted (or secondary sources sampled) varies for each study depending on how many it takes to accurately represent the concourse.

In this study, a total of 23 interviews were conducted between April 2009 and January 2010, varying in length from 10 minutes to over an hour. A standard set of questions (found in Appendix A) was loosely followed. Participants were encouraged to expand on the questions that most interested them and address other topics of interest rather than adhering strictly to the questions. This strategy ensured that the views of the interviewee were not restricted by the structure of the interview, and in turn this contributes to a more authentic concourse (Webler et al. 2009). Following the receipt of written or oral consent, interviews were audio recorded using a digital recording device.

The primary reason for conducting interviews was the practical necessity of collecting statements for the Q sort. However, the interview process also provided important contextual information about the study area which aids in focusing research questions and provides a deeper understanding of themes and issues relevant to the study population (Swedeen 2006). The interviews also provide information about the values and perceptions of respondents, and as such they will be discussed in the Results section prior to the explanation of the quantitative Q analysis.

Coding and Induction

Interviews were transcribed into word processing documents, and these documents were uploaded into Nvivo 7 coding software.

Each document was carefully coded using the Node tool in the Nvivo software. For this first round of coding, statements that related to the research themes were highlighted and associated with one or more Free Nodes depending on the subject. An inductive approach (McKeown and Thomas 1988; Webler et al 2009) was utilized during the coding process, which involved creating Free Nodes on-the-fly whenever a new theme or topic emerged. Based on this wide range of Free Node subjects, broader themes and topics were identified (for the list of Free Nodes, see Appendix B). An inductive approach was used to identify the main topics, themes and areas of interview from the roughly coded Free Nodes. In some Q studies, statements are coded and selected according to theoretical categories that are identified at the outset of the study (Brown 1980; McKeown and Thomas 1988), and this technique is useful when testing participants' adherence to known categories or perspectives. However since this study is

attempting to identify rather than test participants' agreement with statements and themes, the inductive approach is most appropriate.

A second level of coding further narrowed these topics and themes into a smaller set of "structured" codes or categories (McKeown and Thomas 1988; Webler et al 2009). At the end of this process, seven primary structured codes were identified: value of the Moraine; naturalness of the Moraine; naturalness of invasive species; threats to the Moraine from invasive species; threats to the Moraine from human disturbance; tolerance of threats; and preferred future management directions. Several sub-themes were grouped under each of these code categories. These structured nodes were further focused into sub-themes.

Selection of Statements

Due to the limitations of time and participant attention-span, Q sorts are generally limited to between 20 and 60 statements (McKeown and Thomas 1988; Webler et al. 2009). To reduce the number of statements to a manageable size, the approximately 80 statements in the final code categories were grouped together to identify similar and overlapping statements. This was done by printing and individually cutting out each of the statements so they could be moved and grouped with ease. There were several steps in this process, first loosely grouping statements on a similar topic (valuation of the Moraine, for example) then grouping similar statements within each category (relating to the importance of water on the Moraine, for example). Once each statement had been sorted under a topic and grouped with similar statements, one statement or a combination of statements was selected to represent this viewpoint. The final viewpoint was written on

an index card with all of the relevant statements taped to it for reference. In many cases, the wording and positive or negative saliency of the viewpoint statements were modified in relation to the entire collection of final viewpoints.

Neutral or "not sure" statements were included where they were representative of the concourse. Experts on Q method debate whether to include neutral statements in Q sorts. This question in relation to this project was raised to the over 500 members of the Q Method listserv (LISTSERV.KENT.EDU), many of whom have extensive experience with the methodology. The overwhelming consensus from this group of experts was that if there were a significant number of neutral or unsure responses to particular topics or a question, including these neutral statements in the Q sort was an appropriate representation of the concourse.

At the completion of this process, 67 statements remained. A sampling matrix was used to further reduce the statements by focusing on particular themes and questions. Sampling matrices are commonly used in Q Methodology to narrow the statements down to a representative set, but the type of matrix used is different for every study (Dryzek and Berejikian 1993). During this process statements are narrowed down to between 50 and 70, depending on the axes used to organize the statements (Sexton et al 2008; Swedeen 2006; Sickler et al 2006).

After several iterations, it was found that a relatively simple 2x2 sampling matrix was most appropriate for this study (Table 1, below). Statements were divided into descriptive (describing facts) and prescriptive (describing what they believe should happen) categories, and these statements were further organized according to whether

they related to conception of the Moraine itself, or conception of disturbance to the Moraine. Following Woolley and McGinnis (2000) and Swedeen (2006), the descriptive and prescriptive categories were adapted from Dryzek and Berejikian (1993) who utilized factual and advocative categories in a Q study. While some studies (eg. Burns and Cheng 2007) divide statements according to the stakeholders who made them (eg. resource managers, activists, etc.), which was not a viable sampling approach for this study because we recruited individuals who self-identified as involved in Moraine conservation rather than deliberately locating a representative set of stakeholders. As a result, the sampling matrix in this study was modeled after a different approach (eg. Woolley and McGinnis 2000) of organizing statements by relevant themes.

Table 1 - Q Sort sampling matrix. The numbers in the table correspond to statements about the Moraine. This table indicates how statements relating to conception of the Moraine and conception of disturbance are divided into descriptive and prescriptive categories. A full list of the statements and their corresponding numbers can be found in Table 3 in the Results section.

	Descriptive Statements	Prescriptive Statements
Conception of the Moraine (naturalness, values, identity, etc.)	1, 2, 3, 4, 5, 6, 10, 14, 15, 16, 18, 19	30, 31, 32, 33, 35, 36, 41, 42, 43
Conception of disturbance (human and invasive species)	8, 9, 11, 12, 13, 20, 21, 22, 24, 25, 26, 27, 28	44, 46, 46, 47

Online Q Sort Process

Q sorts were conducted online using the web-based program FlashQ (Hackert 2007; eg. Bischof 2010). FlashQ is a free, user-friendly program that was developed by the Q research community for the purpose of conducting online Q sorts. Online sorting eliminates the need to manually enter Q sort data (saving time and reducing errors) and allows the researcher to reach a much larger number of participants. Q sorts are generally conducted one-on-one, in person, which is an enormous time commitment for both the researcher and participant. Reaching participants online was particularly relevant for the Moraine conservation network, which is deeply rooted in online communications because activists are widely distributed, very numerous, and rarely meet in person. Conducting Q sorts does have drawbacks in that it excludes participants who do not have access to the internet or the required technological expertise, and online sorts also do not provide the same depth of data as in-person interviews (Webler et al. (2009). However due to the complex and widely distributed nature of the Moraine conservation movement, the

benefits of online sorting outweighed these drawbacks. In an effort to address the concern that online sorts do not provide enough contextual information about why participants made particular sorting decisions, the major themes and findings from interviews are extensively discussed (independent from Q sort results) in the next section. Also, during the online sorting process participants were asked to comment on the statements with which they most strongly disagreed and agreed.

Webler et al. (2009) was utilized as a guideline for editing the FlashQ code files to suit the parameters for this study. The dimensions of the sorting grid were specified so that participants were limited to sorting only one statement for both the "strongly agree" and "strongly disagree" categories. Participants were sent an invitation to participate in the study with a link to the website where the study was hosted, and were advised that the study had received clearance from the Office of Research Ethics at the University of Waterloo. Once they followed the link participants were met with a welcome page and then a page with instructions and a description of the methodology. Once they began the sorting process, participants we asked to sort each of the 36 statements in the general categories of Agree, Neutral, or Disagree. Statements randomly appeared one at a time, and participants were able to "drag and drop" each statement into boxes for the Agree, Neutral or Disagree categories or press 1, 2, or 3 on their keyboard (as seen below in Figure 3).

Once all statements were loosely sorted into these categories, participants were instructed to drag and drop each statement into a spot on the grid according to their agreement with it (see Figure 3). The program enabled them to move these statements

around as much as they wished, and instructed them to look over the statements a final time before moving on.

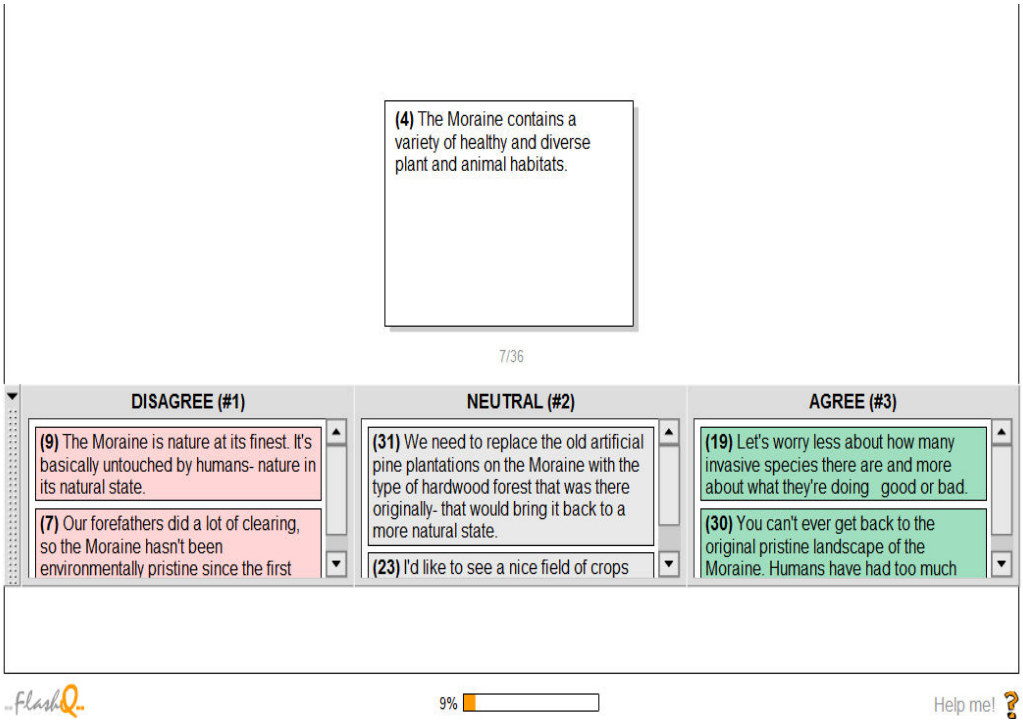

Figure 3 - Sample view of the first stage in the Q sort process. In this stage, respondents loosely categorized each statement as “Disagree,” “Neutral” and “Agree.”

Next, participants were asked to provide more information about the statements that they sorted as “strongly agree” and “strongly disagree.” Text boxes were available to type their response. An additional text box was available for participants to explain if their sorting process was limited by the grid (as seen in Figure 4). Finally, participants were asked some basic information about themselves, including the community in which they lived, whether they owned property on the Moraine, whether they had an organizational affiliation (and if so, which one), and whether there was anything else that

they would like to share. This information was not found to be statistically significant, and so was not included in the results and discussion section.

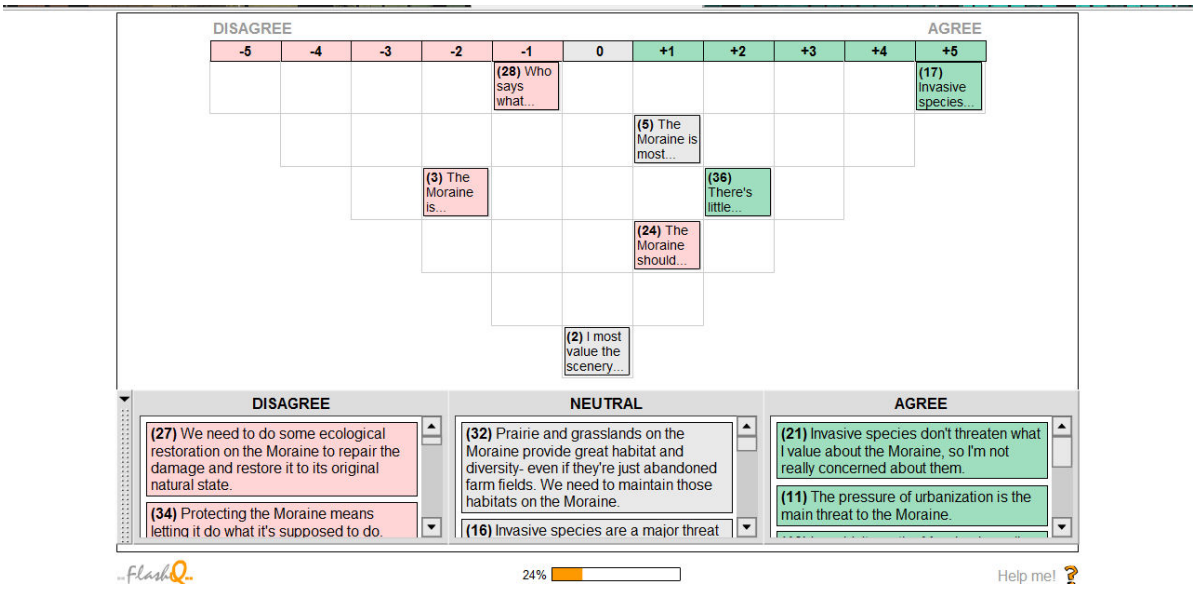

Figure 4 - Sample view of the second stage in the Q sort process. In this stage, respondents moved statements around on the grid until they were satisfied with the sort.

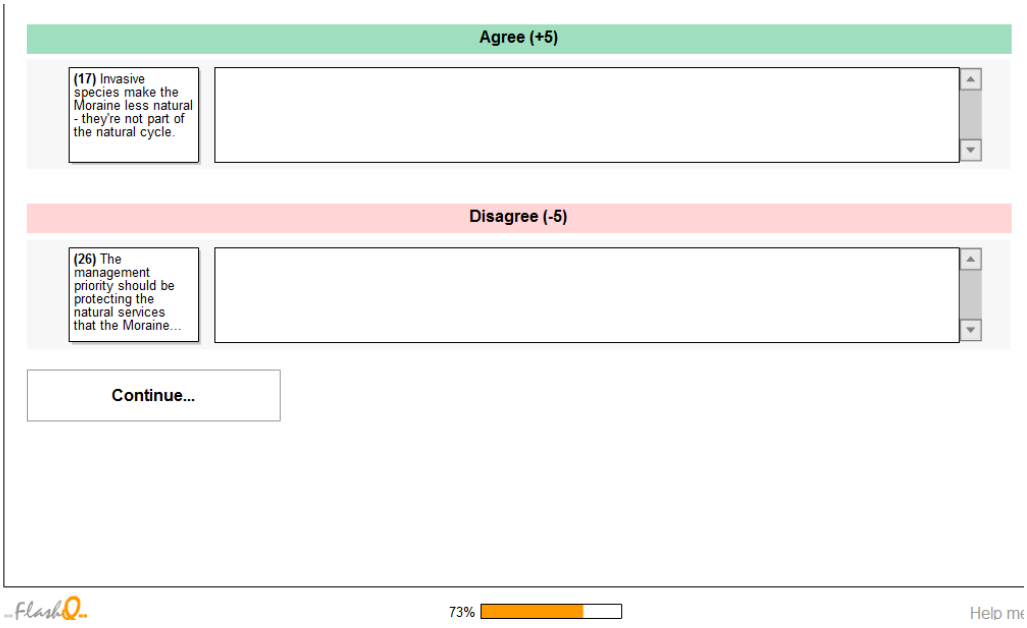

Figure 5 - Sample view of the third stage of the Q sort process. In this stage, respondents provided comments on the statements that they sorted as 5 (most strongly agree) and -5 (most strongly disagree.

Third Stage: Data Analysis

Following Burns and Cheng (2007) and Swedeen (2006), data collected during this study was entered into PQ Method Software, a free program developed by the Q Methodology research community. Using this program, a correlation matrix of the Q sorts was generated. A dependency factor analysis was conducted to cluster Q sorts by common themes, so that individual viewpoints are reduced to a few shared ways of thinking (Sickler et al 2006; Swedeen 2006; Burns and Cheng 2007).

A factor analysis was conducted in PQMethod to produce sets of data for 2, 3, and 4 factors. The factor grouping data set with the fewest number of "non-loaders" (respondents who didn't load on any factor) and the lowest correlation between the factor scores was selected for analysis (Webler et al. 2009). Any loading above 0.4 was identified a "defining sort" in PQMethod. Due to the incredibly rich data produced by the PQMethod software, there are a number of ways in which the data can be analyzed. Analysis during this study focussed on statements in each factor which received a Z score of greater than 1 and less than -1. Statements scored as 1 or higher or -1 or lower indicate the factor groupings' strongest agreement or disagreement with the view expressed in that statement. Where scores were very slightly less than 1 or more than -1 were identified as significant to the analysis, these were included as well.

Results: Interviews

Introduction

Transcriptions from 23 interviews and surveys were coded thematically to detect themes and findings. These themes were organized into unique sections and combined with supporting statements from respondents. Respondents are numbered in order that the interview took place, from ORM1 to ORM23.

Land Use Planning

Respondents expressed a variety of normative or value-based reasons for conserving the Moraine, for example, the values of inter-species and inter-generational equity: "we need to maintain the natural habitat for our animals, plants and waterway purity for our future generations (ORM9)." However, while respondents indicated that their involvement in the conservation movement may be motivated by normative values, they almost unanimously evoked larger-scale land use planning issues to legitimize the importance of the movement. Specifically, protecting the Moraine from advancing urban development was the most often cited reason for conservation, and greenspace and the water-related ecological functions of the Moraine were cited as features that were threatened by this urbanization. This theme reinforces the findings of Gilbert et al (2009), who identified a strong scientific-managerial current in the discourse surrounding the Moraine.

"Greener Than What is Elsewhere"

Significantly, all respondents framed the Moraine as a landform, and in turn framed the importance of the Moraine in the context of the landscape-scale services that it provides. Smaller-scale or more specific conservation values like forest birds and Species at Risk were identified (eg. ORM1 and ORM3), but these features were unanimously situated within the larger land use planning context and the need to protect the entire Moraine landform to facilitate the protection of each of its components.

Respondents' framing the Moraine in terms of the bureaucratic land use process makes sense because activists made use of this process to protect it. By emphasizing the ecological goods and services that the Moraine provides to human populations, and by fitting the movement within existing discourses about urban sprawl, activists deliberately targeted the land use planning process to facilitate its protection.

The land-use planning approach also emerged as a theme in respondents' definition of threats to the Moraine. Development and urbanization were frequently identified as the primary threat to the landform as well as the services that it provides. For example when evaluating whether the Moraine is a natural environment, ORM10 explained "I don't think there's many natural places left, but at least it's greener than what is elsewhere." The belief that the Moraine has value because it's "greener than what is elsewhere" was echoed by ORM11 in the context of urban planning:

> "It was pretty clear before the ORMCA and it's pretty clear now that driving up a street like Dufferin or Yonge that without protection the area would be all subdivisions in a few decades.... I think we need better planning in Ontario. It

shouldn't be a battle to try to preserve greenspace even on the edge of a major city. But until we get some kind of control over planning, acts like the ORMA that simply protect [remaining greenspace] are going to be necessary (ORM11)."

Protecting greenspace corridors from development was also frequently cited as a conservation priority, and in particular respondents emphasized that the Moraine represents some of the last remaining greenspaces in the region. ORM6 valued the "connected landscapes and natural areas" on the Moraine, and ORM11 stressed the importance of "preserving large blocks of habitat. I mean southern Ontario has been so rapidly urbanized that areas of high value natural habitat are getting quite scarce and especially that close to a major city."

Once again, these arguments for protecting the Moraine refer not to the biota of the Moraine itself or even to the services that it provides, but assign it value simply because it has not yet been developed. As ORM6 identifies, the landscape also has value due simply because it is greenspace in close proximity to urban areas: "[it's an] oasis with a different character….[a] wilder heart closer to urban centers….people shouldn't have to go all the way to Algonquin Park to experience nature (ORM6)." Once again, the ecological quality of this greenspace is not as important as the fact that it exists, and as ORM6 further described, because it provides access to "unique scenery and view-sheds."

While respondents indicated strong valuation of the Moraine as a near-urban "oasis," many were concerned that the threat of urban expansion onto the landform had not yet been overcome. In particular, respondents expressed concerns about the effectiveness of the legislation and policies which are in place to protect the Moraine.

Respondents who were aware of the political process of protecting the Moraine or who were involved in the original struggle expressed scepticism that it is protected "forever." ORM23 wondered, "What is Provincial policy going to say next? You know at the moment Provincial policy is directed through the ORMCA to protect the ORM. But you have to remember that it's a fairly new piece of legislation. And the province didn't do a whole lot to protect the Moraine before that. The Province of Ontario tends to be in the business of building cities, not protecting rural areas." In accordance with these concerns, Moraine organizations including STORM and Citizens Environment Watch are in the process of a shift away from advocating the ecological sensitivity of the ORM towards a watchdog role of monitoring municipalities in their adherence to the ORMA. Again, this shift towards monitoring is situated firmly within the bureaucratic, land use planning domain of conservation.

"What's Under Our Feet": Water and the Geological Features of the Moraine

As identified by Bocking (2005) and McElhinny (2006), water is an enormous component of the ORM conservation movement, and the importance of protecting the landform is often framed in terms of its water-related services. This is not just in terms of, but the geological features of the Moraine, the layers of sand and gravel which filter rainwater and force it back up to the surface in the form of rivers, lakes and streams. ORM 1 referred very explicitly to the role of geological features, describing the role of different deposits in water filtration and concluding that: "what's important is what's under our feet. That's one of the key features of the Moraine- the groundwater aquifer

and the fact that we don't understand the extent of them, their capacity, where they connect and that sort of thing (ORM1)."

ORM21 situated the importance of water within a human context: "thousands of people rely on the ORM as a drinking source. Without Moraine water rivers would dry up, habitat [would] be destroyed and [there would be] economic implications for farmers." ORM23 found irony in the conservation emphasis on the biological features of the Moraine when he perceived water as being more important: "ironically the most valued part of the ORM isn't the natural state after 10,000 years, the most value in the Moraine comes from the water."

While water was consistently cited as a high source of conservation value, many mentioned it as an afterthought or referred to it in the context of land use planning. For example, during a walk through his property on the Moraine, ORM3 described the forest, species he commonly encountered, and natural processes of change with great passion and affection, but referred to water only in passing ("oh and of course water on the Moraine is incredibly important") and in reference to the failure of his municipality to enforce water pollution regulations.

Others acknowledged the strategic nature of framing the Moraine in terms of water. As explained by ORM23, a counsellor in York Region, water is perhaps the only way to "sell" conservation of such a large and commercially valuable area:

> "What motivated [the Oak Ridges Moraine Act] was water, and that's why it works. And you get a huge public buy-in to the notion. If you went to cities and said that we think that the most important element is to protect the water supply.

> Would there be anyone in city areas that would disagree with that? The water angle was the strongest argument you could use to get public support. In politics – and I do this every day – if you're not promoting a product that people will buy into, an *idea* that people will buy into, you won't succeed. And water is *it* for the Moraine (ORM23)."

In the face of mounting development pressures, activists needed to focus the conservation movement around an issue that would have political mobility and would gain allies quickly. In addition to "a product that people will buy into," framing the Moraine in terms of its water-related services firmly positions the conservation movement in the strategic realm of land-use planning. Managing water is a bureaucratic process, involving overlapping responsibilities between several tiers of government. It is perhaps unsurprising, then, that interview respondents acknowledged the importance of water without directly engaging with water-related issues; it was seen as being managed within the land use planning process and was accordingly perceived as the domain of "experts" (more on this theme below).

While water primarily emerged as a strategic planning tool in interviews, it must be acknowledged that there is still passionate engagement with water issues within the larger Moraine movement. For example, on October 14, 2010, the STORM Coalition participated in a rally at Queen's Park in Toronto organized around the theme "Our Water Our Lives," where Council for Canadian Director and water rights advocate Maude Barlow called for a strong and strictly enforced provincial water strategy.

One theory for why this passionate and highly value-based emphasis on water did not emerge during interviews is because most respondents were or had been involved in the movement before the ORMCA was enacted. The importance of water was heavily emphasized in early activism efforts, and legislation was created in part because of activists' emphasis on the Moraine's importance as a water collection area. Perhaps this is why many respondents acknowledged the importance of water but were more concerned with discussing the present and future of the landform: in terms of how it will be managed, in terms of the long term policy process, and in terms of how changes in the policy process may undermine conservation efforts in the future. Effectively, since the ORMCA has already been created on the basis of protecting water, the emphasis has shifted to ensuring that this legislation is permanent, effective, and adhered to. Once again, this strategic shift suggests that the

Figure 6 - Protesters at the "Our Water Our Lives" rally at the Provincial Legislature on October 14, 2010. Photo by STORM Coalition.

movement has transitioned from an emphasis on activism to monitoring of the political process of conservation.

"Whatever is Mentioned in the Plan": Reliance on Experts and the Policy Process

Gilbert et al (2009) identified a strong scientific-managerial component in the discourse surrounding the Moraine. Central to this discourse is the importance of human intervention and manipulation of natural systems, relying on "universal truths" as defined by "expertise and experts (p. 390)." This emphasis on human intervention emerged in interviews, in particular when respondents were speaking about how to manage invasive species and how to restore the naturalness of the Moraine. Many respondents referred obliquely to unidentified experts who they relied upon to make complex management decisions.

While discussing invasive species, many respondents identified invasive species as a concern and a negative influence on the Moraine's naturalness. However, beyond referencing well-known invasive species like Garlic Mustard and Dog-strangling Vine, few respondents demonstrated knowledge about invasive species or engaged with the subject of their management in any way. For example, ORM13 believed that "action should be taken wherever possible" to manage invasive species, but that "someone more 'expert' than I should weigh in with those decisions." ORM7 identified invasive species as a negative ecological force, yet when asked how he personally felt about invasive species, he replied, "I don't know enough about invasive species on the Moraine to comment on that I don't think," and referred to the OFAH and MNR as expert bodies who

he considered to be more knowledgeable on the subject. When asked if there was an awareness of invasive species in his community, ORM7 said “not really. I mean we get fliers out every once and a while but it’s not really one of our passions I guess you could say.” Like ORM7, many respondents identified invasive species as “bad” but declined to engage with the subject beyond this initial value judgment.

Much like the delegation of water management to municipal authorities and the larger planning process, many respondents dismissed the particulars of managing for invasive species (eg. which species, how they should be managed, and where they should be managed) to municipal bodies or written plans. For example, ORM4 vaguely referred to the Grand River Conservation Authority as taking care of invasive species, because “they more or less keep the public informed somewhat. And they publish a report and it’s available. And every once and a while we’ll hear about it.” ORM5 listed invasive species removal as a main component of managing and restoring Land Trust properties, but deferred to his organization’s reports and official documents when asked what type of invasive species they manage: “Dog-strangling Vine...there's a couple others... Garlic Mustard...I haven't committed many of them to memory, I'd have to go back to the plan to identify those.” Similarly, when asked about whether the Emerald Ash Borer was a concern, ORM5 replied “no....well, whatever is mentioned in the Plan.”

Respondents also deferred to experts and official plans when considering how the Moraine should be managed and restored: “I don't think I know enough about all the ecosystems on the moraine [to say whether there should be restoration]. But I think that that's embedded in the Plan; there is some measure of restoration (ORM10).” When asked how his organization responds to the question of what an ecosystem gets restored

to, ORM5 explained that they "hire an expert in the field to do that investigation for us, and tell us as best as that person is capable of, what was there, what should be done and how to go about doing it." Even ORM22, a plant biologist himself, explained that the challenges of managing invasive species in the face of complex variables like climate change requires further research and expertise: "we can't do anything right unless somebody ponies up the money for people to sit down and figure these things out. Any restoration project that goes on now is taking a guess and probably some of them are educated guesses and some of them are pure guesses and we need a lot more educated guesses and a lot more research." By relying on political bodies, official plans and expert research to provide expertise and guidance on invasive species, respondents did not engage with the practical issues of managing for invasive species. Despite deferring invasive species to the land use planning process, most respondents did, however, have very negative associations with invasive species, (as further discussed below).

If the Moraine is framed as a land-use planning issue, it makes sense that the specific details of management and restoration are relegated to experts in highly specialized fields. This is particularly true for a formerly contested landscape like the Moraine, where until very recently activists were concerned with social and political processes like urban development and as a result do not consistently engage with ecological processes and how to manage them. Perhaps respondents defer responsibility for invasive species because there are already bureaucratic bodies that exist to manage them, whereas until the formation of relevant NGOs there were no bodies managing the extent of urbanization on the Moraine. However, as discussed in the literature critiquing reliance on experts (eg. Bocking 2004), there are a number of problems associated with

leaving complex and value-laden decisions to be made by those who may not understand the socio-ecological complexity of the landscape. In the case of the Moraine, these experts may not even exist: respondents referred to experts who they believed would conduct or oversee management and restoration, but no such centralized management bodies exist for the Moraine, and when in fact monitoring and research tasks have primarily been left to citizens and NGOs. The section below highlights the complex values that experts and laypersons will face when considering the management of invasive species on the Moraine.

"Flowers in the Wrong Place": Invasive Species in the Context of the Land Use Planning System

Most respondents indicated concern about invasive species, and in particular identified them as having a negative effect on the Moraine's naturalness. ORM9 said that she hoped "that they can be kept under control so they do not 'take over' the good the Moraine does." ORM9 echoed this sentiment by saying that, "we need to keep the 'natural' usefulness of the moraine so we need to monitor the amount of invasive plant and animal species." ORM3 indicated concern for the effect of invasive species on natural balance, while ORM12 expressed concern about invasive species getting out of control: "things like dog strangling vine are really quite serious. . . .And of course the bugs [like Emerald Ash Borer and Asian Longhorned Beetle] are really quite a serious problem." ORM13 evoked the foreign character of invasive species and the concept of ecological "belonging" when she said that "invasive species don't belong anywhere they don't originate in as they have no natural predators." ORM14, (a retired fisheries biologist and volunteer at an invasive species removal event) was concerned about the effect of

invasive species on native species: “they take up space that other more valued species would take up. They use resources that other species could use.” ORM22, a plant biologist, referenced the effect of invasive species on native plant diversity as part of a larger ecological system: “well certainly you don’t want invasive species, because they lower the biodiversity. If you lower the diversity of the plant community then you lower the diversity of everything that depends upon it.”

Nearly all respondents very explicitly identified invasive species as having a negative ecological effect on the Moraine, whether due to issues of “balance,” out-competing native species, or disrupting native ecological systems. However, in discussions of how and why invasive species should be managed, the same respondents revealed very nuanced perceptions towards invasive species. In many cases, these perceptions contradicted their previous characterization of invasive species as “bad,” especially in the context of conservation planning issues on the Moraine. Respondents unanimously identified invasive species as a lesser threat than urbanization and development. For example, ORM11explained that “Oh [the threat of development is] far more serious than invasive species. Habitat loss is clearly the primary threat there and in fact through much of southern Ontario.” He further explained that “the kind of disturbance you get when you build a suburb is off the scale in terms of natural disturbance. I mean invasive species can be a risk to the kinds of systems that you’re trying to protect, but if a habitat has been paved over, then it’s not an issue.”

In addition to considering invasive species as less of a threat than urbanization, respondents minimized the localized effects of invasive species in the larger context of the entire landform and its ecological functions. For example, ORM10 suggested that

invasives are only a problem if they are negatively contributing to the processes and functions of the entire ecological system:

> "Let's step back from the invasives…. And let's worry less about how many species are there and more about what they're doing. Once we can better understand systems in terms of what they process and how they react to stress, then we can start thinking about the relationship between the species and what species are there and what their role is in the system and that will provide a context for invasive species. Because then we can say 'this one is really problematic and really screwing up all the functions' or 'yeah there seems to be enough biodiversity here and we don't really need anything' (ORM10)."

Similarly, ORM5 explained that invasive species can be categorized as positive or problematic based on their ecological effects: "there are lots of invasive species out there that we do not think twice about because they are participating in the ecosystem. Others, the ones we're concerned about, we're concerned about them because they can replace themselves in other parts of the ecosystem and reduce that biodiversity because they take over the area and only the one plant ends up being there." ORM11, a plant biologist, explained that "I work with plant diversity and I'm well aware that the great majority of invaders aren't serious problems…. For example, most of the really prominent grasses up there are non natives and they tend to be pretty big players in these systems." As ORM11 suggests, if protecting and promoting ecological functions is a goal of Moraine conservation, it is irrelevant that a species is native, non-native or invasive as long as it is participating in the system or providing some kind of ecological service. As ORM19

quipped, “invasive species don't make the Moraine less ‘natural,’ just as I think that my garden weeds are just flowers in the wrong place.”

Because the Moraine is framed in terms of its larger ecological services and its importance as a landform, localized invasions are not necessarily considered an issue or management priority; however, as discussed above respondents indicated very strong negative associations with invasive species. This is perhaps due to negative branding of invasive species by governments, NGOs and Conservation Authorities (Gobster 2005). But it could also be affected by a temporal context: that while invasive species are tolerated in the current Moraine environment which is characterized by significant disturbance, in the long term it is expected that invasive species will be eradicated as naturalness is restored over time.

Naturalness and Re-naturalization

As discussed in the introduction to this case study, the Oak Ridges Moraine is unique as a subject of conservation because it is a landscape-scale conservation initiative, because it has such an extensive history of disturbance, and because it is perceived as having natural value in *spite* of this disturbance. The Moraine’s history of extensive human use and alteration was well known by respondents, but it was cited as an important component of the narrative of the Moraine. This background was even acknowledged as part of a cultural heritage which was itself seen as worthy of conservation. Significantly, respondents were highly aware of the Moraine’s history of disturbance but did not perceive these disturbances as reducing the naturalness of the landform. Since the Moraine movement is framed as a bureaucratic, land use planning issue, the current

conservation priorities as discussed above are to ensure the land is protected from further development regardless of its current ecological state; however, this also means that as long as the remaining greenspaces are protected by development, these areas can re-naturalize given time and the absence of further disturbance.

In this way, respondents' perception of disturbance and naturalness was situated within a temporal context. Respondents perceived human-induced disturbance and invasive species as factors which negatively influenced pristineness, and which can be targeted for restoration or renaturalization efforts. Human disturbance and invasive species were not, however perceived as long-term or permanent threats. In contrast, urbanization was seen as a permanent, long-term threat to the Moraine which would reduce naturalness. Compared to this type of disturbance, human activities and invasive species – while acknowledged as disturbances – were seen as minor in comparison because their effects are believed to be temporary or less permanent.

Respondents demonstrated a heightened awareness of past land uses which they identified as having a negative influence on the Moraine's naturalness. Invasive species were also identified as reducing naturalness. In this way, respondents indicated a very precise conception of naturalness which they believed to be authentic for the Moraine; that is, the Moraine was believed to be in a more purely natural state before these disturbances. While respondents very clearly articulated their perception of how these disturbances influenced naturalness on the Moraine, there was greater variation in perceptions of whether this naturalness could be restored, and if so, significant uncertainty regarding how this could or should occur.

The Moraine is Not Pristine

Most respondents did not perceive the Moraine as a pristine landscape, but acceptance of this disturbance did not limit their perception of the Moraine as natural: “Pristine? Hmm. No. I wouldn’t say so. Because it’s seen a lot of alteration (ORM20)”; “well no [it's not pristine]. Our forefathers did a lot of clearing. So I guess we’ve got some stuff that’s old growth and all that but it’s my perception that there’s very little of it that’s been untouched (ORM21).” ORM23 explicitly identified a specific time period after which he considered the Moraine to be no longer pristine, suggesting that “it hasn’t been environmentally pristine since about 1820, since European settlement.”

Those who did identify the Moraine as pristine did so in context with specific environments, highlighting the wide ranging ecological condition of the landform: “I think the Moraine is pristine, judging from the cleanliness I have been fortunate enough to experience (ORM19)”; “The ORM is not environmentally pristine unless you get to a large forested area like the York forest. But if you study the Moraine carefully you’ll discover that there aren’t a lot of areas like that (ORM23).” Overwhelmingly, respondents identified the Moraine as non-pristine as a direct result of past human uses, and the few conceptions of pristineness were limited to references to specific locations which have a reduced amount of disturbance.

Some believed that past human uses of the Moraine could never be reconciled: “obviously you can’t get back to the original pristine landscape. Man has had too much influence over it for that ever to happen. Especially close to a major metropolitan centre like Toronto (ORM20).” However, most respondents indicated that this disturbance could

be overcome. Normative arguments were invoked in calls for deliberate action: "I believe that damage has been done and that changes need to be made to correct this (ORM8)"; "well if you're religious, God put Adam in the garden and said 'take care of it.' So in some ways we didn't do too good of a job over the years, we just raped the landscape. So anything that is going to restore nature to itself then I'm for it (ORM4)."As discussed below, there were two divergent yet occasionally overlapping perspectives relating to the process of repairing disturbance: that nature can regenerate if allowed to do so, and that conducting deliberate restoration can restore naturalness.

Regardless of diverging views on whether, how, or why the Moraine could become natural again, participants were nearly unanimous in their perception of the landform as non-pristine but still having ecological value. This finding conflicts with Gilbert et al (2009), who suggested that the "Moraine is represented as a relative wilderness that is understood as 'unspoilt' by human development (p. 394)." On the contrary, several interviewees dismissed or even scoffed at the idea of the Moraine as a wilderness area; they accepted its disturbances but remained passionate about its conservation value. This finding is, however, consistent with a growing body of work on urban, mundane, or otherwise humanized nature which is perceived as having significant conservation value despite past disturbances or lesser ecological integrity (Newman and Dale 2009; Foster and Sandberg 2004).

Acceptance of Past Disturbance

In addition to valuing the Moraine as natural despite disturbance, respondents were highly aware of and even nostalgic about the landform's complex land-use history. In

fact, the history of disturbance and human use emerged as a powerful thread in respondents' narrative of the Moraine and its identity. ORM23 explains,

> "The area was entirely put to agriculture in the early … times of European settlement. So around in the 1800's from 1825 on, pretty much all of the land was farmed whether it was fit for farming or not. Which means that old growth forest was gone, was cut down. And when we get down to around 1900, the forest cover in our area was down to 7 percent. That was all that was left....It's all sandy up here. Which as you know is what the ORM is by definition. A sandy deposition (ORM23)."

ORM12 linked this farming and deforestation to significant amounts of erosion, particularly in the eastern end of the Moraine:

> "Farms were abandoned and the sand was moving and silted into the rivers. And of course – being a fast river – the mouth of the Ganaraska at Port Hope would get filled up with silt. In the 1940's a fellow named Richardson put together a report, the Ganaraska Watershed Report, and he suggested planting trees and so that's where all the trees come from. Thousands and thousands of acres of trees. And he planted pine, which is a fast growing tree but held the soil and held the sand. And this began the first conservation authority out here. And the Ganaraska forest and the Northumberland forest cover thousands of acres, and have really done a good job of holding the water in these areas (ORM12)."

However, since the Ganaraska watershed "never was pine forest indigenously, it was all hardwood bush (ORM23)," management actions to maintain the naturalness of

this artificial habitat presents some conceptual challenges and reinforces a highly variable perception of what is natural. For example, ORM7, a farmer and Moraine landowner in Northumberland County argued that these artificial plantations "made it more stable and it's better for the environment all around," challenging "everybody [who] says 'well we have to get the forest back to its natural state,' [because] they were thinking of trees but in reality they were sand dunes." While sand blow-outs were created by poor agricultural and forestry practices, ORM7 identified blow-outs as the original, natural state for the area which he perceived as being restored by human management. In this perspective, human interference improved naturalness.

In contrast, ORM23 (a counsellor in Caledon) identified human use of the Moraine as the cause of blowouts and the reason for restoration: "it's sandy soil, not a lot of topsoil, not suitable for agriculture, so once you've got the forests out and fail at your attempt to crop them, then once the land is abandoned [it gets like] almost scrub-like desert bush land." In this statement, he specifically links agricultural practices to erosion and desertification. Similarly, ORM13, a former Moraine resident and former employee of the Oak Ridges Moraine Foundation explicitly (and sympathetically) identified in human activities as the cause for degradation: "in this area much land was poorly farmed by pioneers (who were given poor land as part of an ethnic bias) and who unknowingly created 'blow sands' that were then unfortunately replanted with one variety of fir or pine."

The narrative of this cultural history was described affectionately by several respondents, for example ORM13 listed "its cultural values – evidence of very early habitation and some diverse pioneer activity" as features that she valued about the

Moraine. However, the land use changes that were described in these narratives were limited primarily to farming and occasionally to the logging that settlers carried out to facilitate farming. Gravel extraction was referred to as an economic activity which may need to be tolerated in the future of the Moraine, but even though it has occurred for decades it was not identified as a tolerable or favourable disturbance in the same way as farming. Urbanization or community settlement was never favourably referred to, aside from references to the first European settlement. Centuries of human use of the Moraine area by indigenous peoples was never identified as a disturbance, perhaps due to a cultural perception of indigenous peoples as a "part of nature" (Demeritt 2001; Anderson and Berglund 2003). Strong opposition to gravel mining and urbanization suggests that these are seen as permanent disturbances while agriculture and logging are seen as "soft," more temporary disturbances; perhaps because they don't fundamentally change the composition of the landform through the addition of a built environment or through the alteration of the landform itself.

Restoring Naturalness

Some respondents demonstrated a heightened awareness of disturbance from past human uses, and expressed concern that these disturbances should be repaired in some way. The identification of disturbance as reducing naturalness implies that there is a specific natural state that the Moraine should be restored to. A number of participants were sceptical about this idealized naturalness, questioning how it could ever be determined. Others, however, emphasized the importance of the Moraine as a human landscape, and saw protection of its natural features as supporting human needs and the health of communities. In this view, human uses are not necessarily disturbances.

Despite respondents' very specific perception of the current state of naturalness on the Moraine as a result of its past and present disturbances, there was great uncertainty when speculating about whether deliberate management to control naturalness should occur, and if so, how to do it. While most respondents were generally in favour of restoration, many faltered when discussing the specifics of the process. In response to a question about eradicating invasive species, ORM4 explained that "If I saw some things in there that didn't belong, that humans had introduced there, then I'd be inclined if I had the ability to remove it somehow, and bring back stuff that was there, if it's still available, or if such species are still living." Only a few moments later, however, ORM4 reflected:

> "Well if we introduce stuff in there, can we say it's pristine nature? You know are we going to introduce some diverse species in there that we presume is the right thing. So are we going to put in several different types of animals and plants and create what …we imagine as biodiverse? Or are we going to square off that piece of land and let nature do its stuff (ORM4)?"

While he was in favour of removing invasive species and restoring native vegetation, ORM4 also expressed uneasiness about deliberate attempts to recreate nature. Similarly, ORM19 asked:

> "If we control what species exist then how ecologically sound will the Moraine be? Who would decide what belongs? In other words who says? ....Whatever grows naturally, introduced or otherwise, should be left on the Moraine. Once we

start picking and choosing what belongs, aren't we mimicking society with our issues of who 'belongs' or not and who says so (ORM19)?"

ORM10 echoed this concern for the social and political biases which are embedded in management decisions about nature in the context of restoration:

> "The concern I have there is what it gets restored *to*. What the process is. I think yes there are parts that need to be restored for sure. And that would be great. But I think I'm more concerned about the process. The social and political process of who decides who's going to restore it, to what and that sort of thing (ORM10)."

By raising the difficult questions about how nature can be restored without imposing human values on the landscape, respondents demonstrated a nuanced perception of naturalness. They also evoked the classic wildness *vs.* naturalness paradox as described by Landres et al (2000), where it is not possible to manage nature to make it more natural without imposing a human influence upon it.

Some respondents overcame this paradox by dismissing the idea that human interference reduces the naturalness of ecological systems, arguing that deliberate restoration can improve ecological conditions. ORM11 referred to the Northumberland County and Ganaraska Forests when he explained that "there are a lot of these single-species pine plantations up there that aren't very natural, they tend to be very low diversity, some of them are fire hazards, a lot of them aren't really regenerating very well naturally. And the idea of returning that to the original maple hemlock beech forest seems like the natural thing to do. They'd certainly have higher conservation value." Similarly, ORM11 mentioned the ecological significance of old agricultural fields which

are converting into rare prairie and savannah ecosystems: "a lot of the area is in mixed fields now. Which are an artificial habitat. And at the same time it's where a lot of Ontario's diversity is. So we had a one hectare field up there that had more than 100 vascular plant species in it. So despite the fact that they're an artificial landscape, they really are home for lots of native plants and also native birds (ORM11)." To maintain these habitats, ORM11's organization will be required to prevent forest succession by removing trees or conducting prescribed burns; these management activities will artificially maintain the habitat, but reducing the wildness of the habitat through human intervention will increase naturalness (Landres et al. 2000) and maintain conservation values. ORM23 rejected the idea of authentic restoration on the same grounds, arguing that the Moraine:

> "Needs to be improved, but if you use the word restored you're forcing yourself into a narrower band of options…. if you use the word restore, then you must have a definition of what it ecologically was that you can restore it to… you're assuming that there was an ecology that both was functioning and that can be restored (ORM23)."

In this perspective, if the Moraine is understood as a non-pristine landscape as a legacy of human use, why should deliberate human intervention be seen as making it less natural? Many respondents engaged strongly with the conceptual issues associated with restoration, but few aligned with this perspective. Instead, many respondents reconciled the conceptual challenges of re-naturalization of what they perceive as a disturbed environment by situating disturbance in a temporal context. Overwhelmingly, nearly all respondents invoked the concept of time as a vehicle for re-naturalization; either through

conducting physical restoration and then letting nature take over, through "letting nature take its course" once processes of disturbance have been eliminated.

Temporal Context of Disturbance

While most respondents had difficulty with the idea of how to restore nature, there was significant consensus that if the policies that protect the Moraine are effective in reducing or eliminating disturbances, it will become more natural over time simply through the absence of these negative effects. For example, ORM13 believed that "[the Moraine is] no longer pristine but much of it could be, if left alone." Similarly, ORM21 identified a major goal of the Moraine movement as "stopping these disturbances so it can become more of a pristine natural system"; that once development is halted, the process of regeneration of the Moraine can begin, and that stopping disturbances processes and preventing them from happening with in the future with a policy framework can give nature the time and space to regenerate. ORM11, explained that while "many of the forests [on the Moraine] are highly disturbed and degraded," repairing this disturbance could be achieved with time and a hands-off approach: "I think a lot of restoration would simply be a matter of withholding development or further cutting and letting recovery take its course."

ORM23 described this hands-off restoration process that he has seen on his own land in only a few decades: "mostly what's been happening up here (and mostly because the conservation authority has encouraged it,) is people have allowed the natural forest to gradually take over from the planted forest. My lot is a good example; I have 5 acres up here. And it was all a reforested area in 70's....but we let them die down naturally. So

what's happened now is now that we're 30 to 40 years later is you get a mixed bush…and that's the natural forest that should be here." ORM8 similarly preferred an entirely hands-off approach beyond the disturbance and restoration which has already occurred: "I believe that if humans do not intervene that nature will take care of itself, and that in itself is more natural so I believe it should be left alone."

While these areas of remaining greenspace may not be pristine, since they have not been developed respondents believed that they have the capacity to re-naturalize in the absence of disturbance. ORM5 described a Land Trust property which had been logged and farmed in the past, and while he did not consider it to be pristine, the purpose of conserving the property "is protecting it from getting some years down the road from getting into a developer's hands and the houses being put on it (ORM5)." These areas may not be in pristine condition, but because they have not yet been developed they have the capacity to re-naturalize. ORM23 situated disturbance to the Moraine on a very broad time scale:

> "If we all went away and went back to Europe let's say, and didn't come back for 100 years, it would come back to its natural state. Which means it will burn down every second generation and start again. All of this 'let's protect everything forever' is all bloody nonsense. [Because 10,000 years from now there's going to be a 3 km thick glacier over where our heads are now]. What you need to do is make the best of what you have, with the full understanding that it's going to change. It's going to naturally change. It's going to change into something else and then it's going to change back, in 4 billion years (ORM23)."

ORM4 echoed this sentiment that human disturbance is irrelevant in the context of the earth's history when he recalled "hearing a Native chief some years ago… and he said 'in the end, mother nature will win.' We might be all gone, but mother nature will win."

Similarly, when considering invasive species within the broader time scale, respondents indicated a much more moderate reaction to their eradication. ORM3 referenced Purple Loosestrife when he questioned whether invasive species can balance out with native species over time: "some species probably can adapt and the native species adapt to it, and they can coexist. One of the species that they had a problem with a few years back was that Purple Loosestrife. ... I haven't heard anything about it recently; they seem to have got that thing under control." Along the same lines, ORM8 believed that invasive species "belong on the Moraine," because it "will balance itself out in time with something to counteract the invasive species."

In addition to the perspective of repairing the ecological condition of the Moraine by halting disturbances and letting nature take its course, many respondents advocated for active resource management and restoration. In many cases these two perspectives were not mutually exclusive, as respondents often suggested conducting restoration as a first step and then letting it go "wild" to re-naturalize over several stages of succession or a long time period, echoing Jordan's (2000) perspective on restoration as a process of rewilding, where there is a "letting go" at the end. ORM5, a Land Trust employee, specified a specific time range for naturalness to be restored: "well I'd say 100 years, anyway. Nurturing and really getting a second growth of trees, if you wanted to re-create a previous landscape you'd have to plant what you think would be the appropriate

recreation and let it go through a second growth before you can say it's growing naturally, and that recreation has taken hold, and that to me is a very long term activity."In this way, respondents demonstrated interest in bringing the Moraine back to a more natural state as well as uncertainty about how to do so. While urbanization was identified as a threat resulting in permanent disturbance that trumped all other considerations of naturalness, respondents expressed the expectation that at some point, non-permanent disturbances will be resolved and the Moraine will be re-naturalized.

Working Landscape

Finally, the importance of the Moraine as a working landscape emerged as a strong theme in interviews. In this model, nature and culture are not seen as separate or oppositional to each other. Conservation is viewed as a way of preserving both rural livelihoods and greenspace, as well as facilitating interconnectedness between communities and their surrounding environment. However, the idea of 'naturalness' implies value for an idealized vision of 'nature,' and therefore does not resonate with this method of framing the Moraine. Similarly, because use of the Moraine was viewed in a positive light, human interaction and use of the landform were not necessarily viewed as 'disturbances'. In this way, the perspective that the Moraine is disturbed and can or should be restored is fundamentally contradictory to the idea of the Moraine as an interconnected natural-human working landscape. Surprisingly, many respondents expressed both perspectives to some degree, situating themselves on both sides of the nature-culture debate. Unfortunately, those who believed strongly in the working landscape model found that the conflict between these two perspectives resulted in unequal distribution of the costs and benefits of protecting the Moraine.

Working Landscape Model and the Nature-Culture Divide

As discussed above, many respondents identified the Moraine's land use history as a source of disturbance. In particular, past agricultural practices were explicitly described as a form of past disturbance which reduced the Moraine's naturalness. This is inconsistent with the Moraine's branding as a working landscape, where agriculture and other economic activities were described as an integral part of the Moraine's conservation. To some respondents, the idea of an interconnected natural and cultural conservation model was more relevant than ideas of naturalness. For example, when asked if he saw the Moraine as a natural landscape, ORM10 responded, "well I think the idea of a working landscape is more relevant." Similarly, ORM6 argued for importance of agriculture on the Moraine: "I'd like to see a nice field of crops growing, because that's what feeds the people. Trees are important too but I mean, I'd rather see good protected farmland (ORM6)."

Respondents like ORM6 who valued the Moraine as a working landscape believed that those who see the Moraine as a non-human landscape are unsupportive of economic activities on private Moraine lands and do not appreciate the sacrifices that are made by a small few for its protection. Because the Moraine is a public good which is being protected on behalf of a relatively small number of private individuals, a number of respondents expressed a number of environmental justice concerns about who pays for the "costs" of its protection. ORM6 explains, "most of the people on the Moraine… do like the idea of saving the Moraine, but at what cost? That's the thing I've been preaching for the last few years: that if the Moraine is for everybody, let everybody pay for the

Moraine. Because right now it's the landowner on the Moraine who has to deal with the consequences."

Social justice issues also emerged as a strong theme, but only on behalf of a few respondents. These issues generally referred to the effects of conservation on the rural communities that are stewards of Moraine lands. As Logan and Wekerle (2008) explain, the ORMCP is a unique approach to conservation because a large portion of the protected area of the Moraine is on private land. This generated significant controversy when the ORMCP and ORMA were enacted, because it reduced landowner rights and imposed restrictions on allowable land-uses on private lands on behalf of a common conservation "good" which not all Moraine landowners supported. ORM4 (a counsellor in Port Hope) recalled this controversy: "I was at a meeting about a year ago, east of here, and the complaints by the farmers or the people that showed landowners in that particular meeting was that the ORM plan …devalued their land. They can't do some things with it. And for that reason they were complaining that their land values dropped." As a result of his awareness of these concerns, ORM4 believed that the ORMCP should provide greater benefits to affected landowners:

> "I would like to see something useful develop from this so that it's not just the piece of land. I think that human beings need to enjoy it as well. And for those people who live on it or have property on it, it has to be something that will enhance their lifestyle or give them some value. Not just preserve it for big city wealthy people to come and say, 'how beautiful (ORM4)!"

In this statement, ORM4 raises the issue of urban-rural equity, suggesting that interest in protecting the Moraine originates from urban centers while the negative economic effects are felt by those who live and work in the conservation area. ORM7, a counsellor in Northumberland County, referred to the "urban-rural" conflict very explicitly when he explained, "a lot of people in the rural community think that the urban community wants to make us their greenspace....you've paved your paradise and now you want to take ours for your greenspace."

It is important to note that the inequality as discussed by Wekerle and Logan (2008) and Wekerle and Sandberg (2009) did not emerge as an issue in interviews. When conservation costs and benefits were discussed in the context of wealthy landowners it was in reference to income and lifestyle disparities at different ends of the Moraine. In particular, some respondents were concerned that conservation interests held by stakeholders in the west end of the Moraine might jeopardize goals of growth, prosperity and economic development held by stakeholders in the east end.

While a few respondents believed the costs of protecting the Moraine were shared equally, most indicated that this was likely not the case. Unlike ORM4 and ORM7, however, many respondents attributed the cost-sharing disparity to different lifestyles and interests between the east and west ends of the Moraine rather than an urban-rural divide. Because the Greater Toronto Area is situated in the center of the Moraine, the east and west extremes of the protected area are primarily rural. ORM10 believes, however, the eastern end of the Moraine has faced lesser development pressure and as a result does not identify with the reasons for protecting the Moraine:

> "There are disparities. You know on the west end there are a lot of rich people. As you move east the prosperity kind of drops and there are completely different issues. In the Yonge street corridor there are huge development pressures. In Caledon they're facing huge development pressure. But out in the east end of the Moraine they love development. They're like 'bring it on'…and they're kind of struggling with the Moraine plan and why they're there when out there there's just no pressure yet (ORM10)."

Disparities in lifestyles, and in particular, recreation interests, are also a dividing point for these conflicts. Interests in restricting the use of motorized vehicles – ATVs in particular – on the Moraine has been a hot-button issue, with some Moraine trail users seeking legal counsel to evaluate whether the wording of the ORMCA can be interpreted to ban or restrict motorized vehicles. At a July 2009 public meeting in Roseneath, a proponent "against" the use of motorized vehicles announced that a lawyer had taken a position interpreting the ORMCA to restrict use of ATVs (and offered to distribute this report to interested parties), and a proponent "for" the use of motorized vehicles argued that ATVs, dirt bikes and snowmobiles were a "traditional use" for parts of the Moraine in Peterborough and Northumberland Counties. ORM20 was decidedly against the use of motorized vehicles on the Moraine, but acknowledged the different history of land use history and resource management which led to diverging opinions:

> "I think perhaps the people of the west end have much stronger environmental views. And as you get further east you've got more of the people who are just looking at it as a place for recreation with their ATVs. And they've got snowmobiles in winter. Because that's historically the way it has been used…. It's

> really partly the great big plantation forests, the Ganaraska and the Northumberland. And with forest trails I suppose the local authorities in that area have just tried to make sense out of that situation and provide for recreation (ORM20)."

A thorough analysis of the possible divisions between urban and rural or east and west is beyond the scope of this study. While it is possible that these divisions do exist, there appear to be stronger and more deeply rooted variations in perceptions of the relationship between nature and culture: that the Moraine is disturbed from human use but conservation will allow it to re-naturalize (the naturalness of the Moraine is non-human and nature and culture are separate); and that the Moraine is both a natural and a cultural working landscape (nature and culture are interconnected). These variations are not necessarily divided among geographic or demographic lines, as respondents from both sides expressed different views.

Significantly, as mentioned above, many who identified the difficulty of restoring pristine nature and who were in support of the working landscape model also indicated that past human use of the Moraine resulted in disturbance, and that these disturbances can be rectified by allowing the Moraine to 're-naturalize'. The tension between these two competing concepts suggests the working landscape model faces some conceptual challenges. Because it fails to engage with values for naturalness and consideration of restoration, the model does not capture a subtle yet significant source of conservation value held by the majority Moraine advocates, and does not realistically address the social justice issues which are an unintentional result of conservation.

Results: Factor Analysis

Determining the Number of Factor Groupings

Sets of data for 2, 3 and 4 factors were produced in PQMethod. The analysis with three factor groupings was selected as the most appropriate because it had a small number of non-loading participants and the lowest correlation between factor scores (McKeown and Thomas 1998). For a comparison between 3 and 4 factor groupings, with "defining sorts" highlighted in bold, see Table 2, below.

Table 2 - Comparison of respondent loadings with data rotated for 3 and 4 factors. Defining scores highlighted in bold indicate which factor grouping respondents loaded under. Note that respondents without a bolded score did not load on any factor ("non-loaders").

Respondent Loadings on 3 Factors				Respondent Loadings on 4 Factors			
	Factor 1	Factor 2	Factor 3	Factor 1	Factor 2	Factor 3	Factor 4
ORM24	-0.512	**0.7713**	0.1681	0.0055	0.1157	0.0952	**0.8877**
ORM25	**0.5021**	0.0070	0.2481	0.2425	-.0688	**0.6940**	0.2154
ORM26	**0.7162**	0.3589	0.0235	**0.7659**	0.1185	0.1273	0.1957
ORM27	0.5505	**0.5739**	0.1004	**0.6597**	0.2415	0.0229	0.4014
ORM28	0.4911	-0.0632	0.4848	0.3525	0.4027	0.4289	-0.1219
ORM29	**0.5600**	0.0536	0.4113	0.3513	0.1951	**0.6195**	0.1383
ORM30	0.3060	0.0898	**0.6947**	0.3147	**0.8243**	0.1237	-0.1619
ORM31	**0.8132**	0.1884	0.0645	**0.7061**	-0.0382	0.4521	0.1831
ORM32	**0.6633**	0.3645	0.3360	**0.6147**	0.3142	0.3600	0.2844
ORM33	**0.7989**	0.0731	-0.1209	**0.8161**	-0.0354	0.1322	-0.1035
ORM34	0.5052	0.5370	0.3111	0.4329	0.1993	0.4208	0.5893

ORM35	0.0007	0.4200	**0.6629**		-0.0831	0.5481	0.3442	0.4909
ORM36	**0.6138**	0.2954	0.1451		**0.5950**	0.1502	0.2514	0.2134
ORM37	**0.6052**	0.3290	0.2706		**0.5574**	0.2409	0.3322	0.2699
ORM38	**0.6544**	0.2894	0.4762		0.6147	0.5010	0.3319	0.1390
ORM39	0.2865	0.5374	0.5395		0.3357	**0.6259**	0.1292	0.3968
ORM40	0.1653	-0.1780	**0.8180**		-0.1117	0.5509	**0.6662**	-0.0620
ORM41	**0.6078**	-0.0689	0.3608		0.4911	0.3094	0.3928	-0.1594
ORM42	-0.0764	0.5642	**0.6351**		0.0664	**0.8362**	-0.1351	0.3535
ORM43	**0.4969**	-0.1123	0.2941		0.3315	0.1527	**0.4606**	-0.0941
ORM44	0.5804	0.4537	0.4038		0.5620	0.4133	0.3048	0.3552
ORM45	0.1894	0.2612	**0.7254**		0.1577	**0.7513**	0.2342	0.1420
ORM46	**0.7754**	-0.1645	0.3294		0.5917	0.2050	0.5472	-0.2130
ORM47	**0.6388**	0.3742	0.2335		**0.6831**	0.3383	0.1450	0.1872
ORM48	**0.5047**	0.1275	0.3283		0.3191	0.1167	**0.5691**	0.2339
ORM49	**0.7124**	0.2302	0.1266		**0.6685**	0.1127	0.3088	0.1483
ORM50	0.181.2	0.7169	-0.1559		0.4304	0.1006	-0.3451	0.5315
ORM51	**0.7804**	0.0627	-0.0074		**0.8015**	0.1000	0.1269	-0.1484

Table 3 - Rank statement totals for 3 factor groupings. “Significant” scores are greater than 1 and less than -1, and are highlighted in bold.

	Factor Grouping		
Statement	1	2	3
1) The Moraine is most valuable as a natural system that filters and replenishes our water supply.	**1.769**	0.263	**1.532**
2) I most value the scenery and the unique landscape features of the Moraine.	-0.062	-0.234	0.017
3) The Moraine is important because it's so close to urban centers- people shouldn't have to go all the way to	0.187	-0.363	**1.050**

Algonquin Park to experience nature.			
4) The Moraine contains a variety of healthy and diverse plant and animal habitats.	0.755	0.807	**1.692**
5) The Moraine is most valuable as a connected landscape- one of the last remaining green corridors in Ontario.	**1.235**	0.912	**1.162**
6) The Moraine is both a natural and a human landscape. It's not a nature preserve behind gates- it's a working landscape where people live, work and play.	0.538	**1.766**	**1.159**
7) Our forefathers did a lot of clearing, so the Moraine hasn't been environmentally pristine since the first European settlement.	0.087	0.807	**-0.168**
8) If we all went away and left the Moraine alone for 100 years it would go back to its natural state.	-0.512	0.310	**-1.521**
9) The Moraine is nature at its finest. It's basically untouched by humans- nature in its natural state.	**-1.523**	-0.526	**-1.136**
10) I wouldn't say that the Moraine is really natural, but it's certainly greener than the development that surrounds it.	0.263	0.859	-0.293
11) The pressure of urbanization is the main threat to the Moraine.	**2.105**	**1.613**	-0.460
12) I don't see a conflict between preserving the Moraine and trying to use it for human benefit at the same time.	-0.563	**1.070**	**1.242**
13) If the Moraine is for everybody, let everybody pay for it. Because right now it's the landowner who has to bear the burden of Moraine conservation	0.073	**1.427**	**-1.436**
14) The conservation policies that protect the Moraine are permanent and quite strong.	**-1.961**	-0.783	**1.047**
15) Climate change is going to cause a lot of damage to the Moraine.	0.587	-0.234	-0.157
16) Invasive species are a major threat to the Moraine. They don't belong and take up space that other more valued species would take up.	0.592	-0.468	0.412
17) Invasive species make the Moraine less natural- they're not part of the natural cycle.	0.018	**-1.556**	-0.532
18) I'm not sure that we have to have only native species in an ecosystem. There are lots of invasive species out there	-0.427	-0.105	0.212

that we don't think twice about because they are participating in the ecosystem.			
19) Let's worry less about how many invasive species there are and more about what they're doing – good or bad.	-0.086	0.544	**1.280**
20) The threat of invasive species is far more serious than urban development and human uses.	**-1.391**	**-1.251**	0.110
21) Invasive species don't threaten what I value about the Moraine, so I'm not really concerned about them.	**-1.384**	-0.263	**-1.436**
22) The Moraine is already a disturbed landscape, so why bother worrying about invasive species?	**-1.574**	-0.625	**-1.273**
23) I'd like to see a nice field of crops growing on the Moraine, because that's what feeds the people.	-0.971	-0.625	-0.114
24) The Moraine should be managed to allow hiking, education and other 'soft' public uses that won't cause damage.	0.741	**1.117**	**1.364**
25) If you make the Moraine accessible to everyone they're going to cause an awful amount of damage.	0.285	-0.754	**-1.146**
26) The management priority should be protecting the natural services that the Moraine provides, like water filtration. That in turn leads to conservation of everything else	**1.482**	-0.053	**1.071**
27) We need to do some ecological restoration on the Moraine to repair the damage and restore it to its original natural state.	**1.039**	-0.930	0.583
28) Who says what "belongs" on the Moraine or how it should be restored? If we interfere and start making decisions on behalf of nature, is it really natural anymore?	**-1.391**	-0.052	**-1.021**
29) The first management priority should be to stop the disturbances so it can become more natural over time.	0.985	0.602	-0.478
30) You can't ever get back to the original pristine landscape of the Moraine. Humans have had too much influence over it.	-0.335	0.964	0.355
31) We need to replace the old artificial pine plantations on the Moraine with the type of hardwood forest that was there originally- that would bring it back to a more natural state.	0.064	**-1.953**	-0.882

32) Prairie and grasslands on the Moraine provide great habitat and diversity- even if they're just abandoned farm fields. We need to maintain those habitats on the Moraine	0.893	**1.275**	0.812
33) The main priority should be increasing the size and quality of forests on the Moraine.	0.303	**-1.169**	**-2.09**
34) Protecting the Moraine means letting it do what it's supposed to do. Just let nature take care of itself.	-0.289	**0.181**	**-1.387**
35) Pesticides should be carefully used to prevent invasive species from taking over and get rid of them if possible.	-0.073	**-2.391**	-0.026
36) There's little hope that invasive species can be wiped out so why fight a losing battle? We shouldn't bother trying to control them.	**-1.460**	**-1.181**	**-1.426**

Results Summary

In terms of the largest points of consensus, respondents consistently emphasized the importance of the Moraine's water-related ecological services, and also consistently articulated concern about the threat that urban development pressures pose to the landform. Both of these themes were framed within the land use planning process, as respondents demonstrated heightened awareness of the bureaucratic and political aspects of Moraine conservation. Accordingly, many respondents indicated their intentions to continue to participate in the bureaucratic processes that protect the Moraine, acting as civil society watchdogs to ensure that conservation legislation is both permanent and effective.

In addition, respondents consistently described the Moraine in the context of its past land uses; the cultural history of the landform is well known, and was attributed to respondents' rejection of the Moraine as a pristine landscape. This past cultural history

was identified as a negative influence on the Moraine's naturalness. In addition, invasive species were identified as a negative ecological force which also reduced naturalness; however, responses to invasive species were varied, as respondents acknowledged both the practical challenges of eradicating invasive species as well as the conceptual problems of identifying them as unnatural in a non-pristine environment. Most respondents believed that the naturalness of the Moraine could be restored, though there were a variety of opinions on how and why this should occur. The section below discusses these themes as they emerged in each of the three distinct factor groupings.

Factor Groupings

Factor groupings are discussed sequentially. Themes which emerged during analysis of the data are clustered under unique headings within discussions of each Factor grouping. Many of the themes overlap, and attention is drawn to areas of significant agreement or disagreement within each Factor. This analysis focuses on "significant" sorts, which are statements that received a total of greater than 1 (significantly positive) or less than -1 (significantly negative). During discussion of the factor groupings, quotations are only cited from respondents who sorted within the factor under discussion. In a few explicitly identified cases, quotations from a respondent who was ranked outside of the grouping were cited when the respondent had a strong view on the statement (thus scoring similarly to the factor grouping under discussion).

Neutral Scores

Neutral scores can also be significant, and neutral scores should not be ignored because identifying that a study population feels ambivalent about a viewpoint can be as

significant as identifying strong agreement or disagreement (Brown 1980; McKeown and Thomas 1988). However, dedicating too much consideration to neutral scores can confound analysis, because if participants do not understand a statement or find it to be irrelevant, they will 'throw it away' by sorting it neutrally. To prevent overlooking potentially significant viewpoints, analysis was first focused on strong statements of greater than 1 or less than -1. Secondly, the rank statement totals for each factor were scrutinized to identify differences of opinion between the three factor groupings. For example, Factors 1 and 2 may strongly agree with a statement while Factor 3 may sort it very neutrally. Identifying these discrepancies between factors was used as a strategy to avoid missing significant neutral sorts.

Respondents

Respondents are also numbered sequentially starting from ORM24, because the numbering continues from the 23 interview respondents to avoid confusion. Comments exist for the statements that respondents sorted as 5 and -5, and as many of these comments are presented as possible. Where a respondent was sorted into one factor but had views and corresponding comments which overlapped with another, these comments were occasionally included in the discussion of the other factor (with a notification that the comment is from a respondent who sorted in another factor). Note that while respondents may be discussed in relation to the grouping that they sorted under (ie. "Factor one respondents"), it is understood that the factor groupings are a method of identifying patterns among Q sorts (Webler et al. 2009), but are not indented to represent the full views held by each individual respondent.

Factor 1

Participants who ranked highly in this factor grouping indicated concern for development, and in particular demonstrated a heightened awareness of urban planning issues. Many had little faith in the policy process, and ranked weak or impermanent policy as concerns. They framed the Moraine in terms of higher-level or broader values, prioritizing the ecological services that the landform provides (especially water,) and considered the conservation movement in terms of protecting it from development so that it can continue to provide these services long-term. In particular they framed the Moraine within the political or bureaucratic process of conservation, considering its landform-scale features and relying on experts and political processes to ensure its protection. Surprisingly, however, respondents who perceived the Moraine in this manner agreed with the idea of the Moraine as pristine while at the same time indicating high concern for invasive species and a preference for repairing or maintaining the naturalness of the landform. While this factor grouping indicated awareness of previous disturbance and were in favour of managing invasive species if possible, they primarily engaged with the bureaucratic or political issues surrounding the Moraine.

Table 4 - Normalized Q sort for Factor 1. This table represents an average sort for a respondent in this factor grouping.

Strongly Disagree									Strongly Agree	
-5	-4	-3	-2	-1	0	1	2	3	4	5
14	9	20	8	35	3	15	32	5	1	11
	22	28	12	19	7	6	4	27	26	
		36	23	34	13	33	24	29		

21	30	31	25	16
	18	17	10	
		2		

Table 5 - Normalized ranking of statements for Factor 1 that had significant scores. This table represents an average sort for a respondent in this factor grouping. Note that high positive scores indicate strong factor agreement, and low negative scores indicate strong disagreement, and that "significant" scores are identified as greater than 1 or less than -1.

Z Scores	Statements
2.105	11) The pressure of urbanization is the main threat to the Moraine.
-1.961	14) The conservation policies that protect the Moraine are permanent and quite strong.
1.769	1) The Moraine is most valuable as a natural system that filters and replenishes our water supply.
-1.574	22) The Moraine is already a disturbed landscape, so why bother worrying about invasive species?
-1.523	9) The Moraine is nature at its finest. It's basically untouched by humans- nature in its natural state.
1.482	26) The management priority should be protecting the natural services that the Moraine provides, like water filtration. That in turn leads to conservation of everything else.
-1.460	36) There's little hope that invasive species can be wiped out so why fight a losing battle? We shouldn't bother trying to control them.
-1.391	20) The threat of invasive species is far more serious than urban development and human uses.
-1.391	28) Who says what belongs on the Moraine or how it should be restored? If we interfere and start making decisions on behalf of nature, is it really natural anymore?
-1.384	21) Invasive species don't threaten what I value about the Moraine, so I'm not really concerned about them.
1.235	5) The Moraine is most valuable as a connected landscape- one of the last remaining green corridors in Ontario.

1.039	27) We need to do some ecological restoration on the Moraine to repair the damage and restore it to its original natural state.

Urbanization and Land Use Policy

Respondents who were sorted in Factor 1 overwhelmingly identified urbanization as the primary threat to the Moraine, with statement 11 (*"The pressure of urbanization is the main threat to the Moraine")* sorted significantly high at 2.105. ORM46 expressed concern about urban expansion because "the politicians favour urbanization over preserving this important natural feature. After all they don't think beyond the next day."ORM48 linked urban growth as a higher-scale issue, because it "is ultimately driving many of the other threats. It is a direct and permanent loss of natural cover and agriculture, it is what creates the demand for aggregate extraction, and it is the source of recreational pressures."

The statement with the second-highest ranking in the normalized factor scores referred to the permanent nature of Moraine policies, a sentiment that was very strongly disagreed with by many respondents in Factor 1 with a score of -1.961, *("The conservation policies that protect the Moraine are permanent and quite strong"*; statement 14). In fact, this statement was sorted as "most strongly disagree" by the largest number of respondents in this factor grouping, with 9 out of 17 in total. ORM32 simply cautioned, "no policy is ever permanent!" while ORM37 indicated concern about the ORMCP itself, "there are too many loopholes in the plan as it is now that still allow for harmful activities that will negatively influence the Moraine." Others acknowledged that in such a densely inhabited region, demands of growing populations will always pose a threat to conservation: "humans are invasive and multiply exponentially. As long as there

are more humans than available land for developments or farming, the Moraine will be threatened" (ORM33); "policies that protect the Moraine are constantly under pressure from development, intense farming operations, gravel extraction and leisure activities. It is important that policy sets out guidelines to work toward a balanced approach to protecting and enhancing this important land feature in Ontario (ORM43)." Some respondents believed that the conservation policies are already proving to be ineffective:

> "Conservation policies seem to have little effect on protecting the Moraine. All across its 160 km length, developments are eating away at its boundaries and now developers are eying Moraine groundwater to supply off-Moraine developments. Conservation authorities appear to have little, if any ability to make developers accountable for negative environmental impacts on the Moraine (ORM49)."

Similarly, ORM25 referred to a specific case where development of a Moraine prairie was condoned by the local municipality and this violation was not being addressed by the province: "The provincial government is not enforcing the ORMCP! Their response to pleas to do so is greeted with the advisory to contact the local municipality with your concerns. . . [but] the local municipality, in this case, is the one causing the destruction of rare prairie habitat." Because these respondents are highly aware of the land use planning process of protecting the Moraine, they are sensitive to the political process which may alter conservation polities or render them less effective. This is consistent with the shift of the Moraine movement from activism to monitoring political bodies in their adherence to conservation policies.

Water and Watershed Planning

Like urbanization, the importance of water is a key theme in the Moraine movement and consequently emerged in the sorting pattern of this factor grouping. Six respondents sorted statement 1 *("the Moraine is most valuable as a natural system that filters and replenishes our water supply"*) as their "most strongly agree" statement. This statement was considered important by all in this factor grouping, with the third-highest normalized factor score of 1.769. ORM49 highlighted human dependence on the Moraine's water-related services: "without the filtration system offered by the unique land structure, composition and formation of the Moraine, water sources that over 250,000 persons depend on will become compromised. The future of the world will depend on potable water supply, and that supply is already in great danger." ORM41 emphasized the importance on protecting this water source from being 'lidded' by urban development: "because of the geologic structure of the Moraine, it is like a big ground-water recharge zone. That's why I thought the first priority should be to keep from putting a 'lid' on the barrel." ORM38 argued that water is connected to the larger ecological functions and processes on the Moraine, including human livelihoods: "the most important role of the Moraine is its role in the hydrologic cycle – the whole region depends on the Moraine as its rain barrel – the rest (natural heritage, human endeavours and livelihoods flow from this)."

Respondents in Factor 1 strongly agreed with statements that referred to protecting larger-scale water-related services, similar to ORM38's suggestion that protection of other ecological services will "flow" from protecting the hydrologic services. Statement 26 *("the management priority should be protecting the natural*

services that the Moraine provides, like water filtration. That in turn leads to conservation of everything else") emphasizes protecting the entire ecological system which will encompass a larger segment of the Moraine's valued features. Factor 1 ranked this statement highly at 1.482. Like the statement about the importance of water, six respondents sorted statement 26 as "most strongly agree." Some respondents who ranked this statement most highly related it to the importance of water, echoing statement 1. As described by ORM43:

> "Water is something that is imperative to human survival and as Ontarians we are lucky to have [a] land feature like the Oak Ridges Moraine. This feature natural[ly] filters and provides clean water for human consumption to thousands of people on a daily basis. This is a resource that needs continued protection and management is where the protection begins (ORM43)."

ORM32 made the argument that protecting these ecological services now is much simpler than attempting to restore them later: "protection is less expensive than restoring or recreating natural processes. The value of all ecological services needs to be taken into account and reported in all decision making."

Naturalness and Invasive Species

Respondents who were grouped in Factor 1 dismissed the idea that the Moraine is pristine, untouched nature. Statement 9 *("the Moraine is nature at its finest. It's basically untouched by humans – nature in its natural state"*) was ranked as strongly negative in the normalized factor scores, at -1.574. Two participants indicated that they "most strongly disagree" with this statement. ORM48 justified this high sorting by explaining,

"nowhere on the planet is completely untouched by humans. The Moraine was modified by indigenous groups and then completely cleared by European settlers. Even the most natural areas are suffering from air pollution."

While respondents in Factor 1 universally dismissed the statement about the Moraine being pristine by sorting it very low, this grouping indicated high concern for invasive species. Factor 1 respondents strongly disagreed (-1.460) with statement 36 which suggested that invasive species shouldn't be a concern because the Moraine is already disturbed (*"the Moraine is already a disturbed landscape, so why bother worrying about invasive species?"*). ORM28countered this statement by suggesting that "we should manage invasives" and while ORM29 indicated very high concern about invasive species ("invasives are the bane of my existence") this respondent also acknowledged the difficulties of managing invasives and the importance of considering their role in ecological systems: "I strongly feel that they need to be managed, not eradicated; [we need] realistic goals to control and maintain them and perhaps even understand their role in the ecosystem, if it boils down to survival of the fittest we need to realize and understand how to better live with invasives." In this statement, ORM29 acknowledged the difficulties with eradicating invasive species on such a large scale, but remained in favour of "realistic goals" to manage them. Similarly, respondents in Factor 1 strongly disagreed (-1.574) with statement 22, which suggested giving up on invasive species control because it is too difficult (*"There's little hope that invasive species can be wiped out so why fight a losing battle? We shouldn't bother trying to control them"*). ORM46 argued that "by not bothering [with invasive species] we only ensure much more serious damage in the future."

Given respondents' strong views on controlling invasive species, it is perhaps unsurprising that invasive species were identified as threatening what this group values about the Moraine. Statement 21 *("Invasive species don't threaten what I value about the Moraine, so I'm not really concerned about them"*) was sorted very low at -1.384. However, despite identifying invasive species as a negative force in ecosystems, this factor grouping acknowledged urbanization as a greater threat, by strongly disagreeing (-1.391) with statement 20 (*"the threat of invasive species is far more serious than urban development and human uses"*).

These very strong negative views of invasive species suggest that Factor 1 has a very specific conception of the naturalness of the Moraine which does not include these types of species. Similarly, Factor 1 endorsed ecological restoration to restore the naturalness of the Moraine and reduce the effects of previous disturbance. Statement 27 *("We need to do some ecological restoration on the Moraine to repair the damage and restore it to its original natural state"*) was ranked fairly high at 1.039. ORM28 explained their designation of this statement as "most strongly agree" by saying that it is "so important not to lose hope – there is always something we can do." Once again, this group identified an "original natural state" of the Moraine which can be restored *to* with the right amount of expert knowledge and management.

Conversely, however, these individuals strongly disagreed (-1.391) with statement 28 which questioned whether it is possible to determine what "belongs" in natural systems *("who says what 'belongs' on the Moraine or how it should be restored? If we interfere and start making decisions on behalf of nature, is it really natural anymore?"*). Disagreement with this statement is perhaps the result of this factor's framing of the

Moraine as in a scientific managerial context, where experts and expertise are relied on to manage and make decisions. This is to say, that because this group relies upon experts to interpret the Moraine through lenses of science and other expertise, that these individuals are in fact seen as very capable of determining what "belongs" on the Moraine. However, ORM38 indicated that they "most disagreed" with this statement because all resource management decisions are subjective, and conservation policies should be based on values and community needs:

> "It has not been natural since before First contact (European invasion). All policy decisions are based on values and so the responsible thing is to establish foundational values of what is important to communities and from this development [of] management strategies. To think otherwise is stupid (ORM38)."

In this statement, ORM38 draws on the Moraine's history of human use and highlights the cultural context of resource management decisions to make the point that conservation planning should be based on values, not an idealized notion of naturalness. Once again, the larger scale of conservation planning across many communities trumps ideals of naturalness. Similarly, this factor grouping also identified urbanization as a greater threat than invasive species by negatively sorting (-1.391) statement 20 (*"the threat of invasive species is far more serious than urban development"*). Factor 1 may have strong negative views of invasive species and may support their control or management, but the over-arching goal of this factor grouping was clearly identified as larger land use planning considerations. Invasive species are seen as reducing naturalness on the Moraine but ultimately this group considers the conservation of the landform in

terms of protecting the ecological services that it provides, and these priorities overcome support for restoration and invasive species control to in pursuit of idealized nature.

Factor 2

Factor 2 was a much smaller grouping, with three participants sorted in this category. A number of strong themes emerged from this factor grouping. This group cited urbanization as a greater threat than invasive species and indicating high resistance to using chemicals in their control. This group agreed that invasive species don't make the Moraine less 'natural,' and out of all three of the factor groupings, respondents sorted in Factor 2 demonstrated the greatest amount of acceptance for invasive species. These respondents expressed concern about urbanization, and believed that the urban expansion on to the Moraine was a worse threat than invasive species. This may be the result of an acceptance of disturbance on the Moraine, because Factor 2 did not indicate preference for an idealized form of nature that was separate from human uses. In fact, not only did Factor 2 respondents see the Moraine as both a natural and human working landscape, but respondents in this category also indicated an interest in prairie and grassland habitats (many of which on the Moraine are old agricultural fields) and responded negatively to statements about restoring or replanting forests. Finally, Factor 2 indicated concern for social justice issues on the Moraine, arguing that all Moraine users should share the costs of its conservation.

Table 6 - Normalized Q sort for Factor 2. This table represents an average sort for a respondent in this factor grouping.

Strongly Disagree	Strongly Agree

-5	-4	-3	-2	-1	0	1	2	3	4	5
35	17	27	23	2	34	4	30	32	11	6
	31	33	22	21	28	29	5	24	13	
		20	25	3	26	19	10	12		
			14	16	18	8	7			
				9	36	1				
					15					

Table 7 - Normalized ranking of statements for Factor 2 that had significant scores. This table represents an average sort for a respondent in this factor grouping. Note that high positive scores indicate strong factor agreement, and low negative scores indicate strong disagreement, and that "significant" scores are identified as greater than 1 or less than -1.

-2.391	35) Pesticides should be carefully used to prevent invasive species from taking over and get rid of them if possible.
-1.953	31) We need to replace the old artificial pine plantations on the Moraine with the type of hardwood forest that was there originally- that would bring it back to a more natural state.
1.766	6) The Moraine is both a natural and a human landscape. It's not a nature preserve behind gates- it's a working landscape where people live, work and play.
1.613	11) The pressure of urbanization is the main threat to the Moraine.
-1.556	17) Invasive species make the Moraine less natural- they're not part of the natural cycle.
1.427	13) If the Moraine is for everybody, let everybody pay for it. Because right now it's the landowner who has to bear the burden of Moraine conservation.
1.275	32) Prairie and grasslands on the Moraine provide great habitat and diversity- even if they're just abandoned farm fields. We need to maintain those habitats on the Moraine.
-1.251	20) The threat of invasive species is far more serious than urban development and human uses.
-1.169	33) The main priority should be increasing the size and quality of forests on the

	Moraine.
1.117	24) The Moraine should be managed to allow hiking, education, and other "soft" public uses that won't cause damage.
1.07	12) I don't see a conflict between preserving the Moraine and trying to use it for human benefit at the same time.

Invasive Species

The most strongly sorted statement by respondents grouped in Factor 2 related to the use of pesticides to control invasive species: statement 35 (*"pesticides should be carefully used to prevent invasive species from taking over and get rid of them if possible"*) received a score of -2.391, the most significant score for any statement among all three factor groupings. ORM24 argued that the use of chemicals is "impractical and dangerous," and ORM50 questioned "if pesticides are more and more being banned by municipalities why would we even think of introducing them into the Moraine?" Resistance to using chemicals to control invasive species may result from this grouping's perception of invasive species as a minimal threat compared to urbanization, as respondents generally disagreed (-1.251) with statement 20 (*"the threat of invasive species is far more serious than urban development and human uses"*). Similarly, Factor 2 respondents strongly disagreed with statement 17, which suggested that invasive species *"make the Moraine less natural – they're not part of the natural cycle."* With a score of -1.556, Factor 2 felt much more strongly about this statement than Factor 1 (0.018) and Factor 3 (-0.532). This pattern was consistent for all of the above statements related to invasive species; overall, out of the three factor groupings, Factor 2 demonstrated the greatest amount of acceptance for invasive species. This group also indicated their value for what can be considered disturbed habitat types.

Respondents in Factor 2 indicated high interest in prairie and grassland habitats by sorting statement 32 (*"prairie and grasslands on the Moraine provide great habitat and diversity – even if they're just abandoned farm fields. We need to maintain those habitats on the Moraine"*) highly at 1.275. While habitat types like Oak Savannah and Tallgrass Prairie were once very common across the entire landform, these areas were targets for agriculture and development and remain only in small fragments (with the exception of the Rice Lake Plain on the east end of the Moraine, which is the subject of an excellent research and restoration program). These habitats occur on agricultural lands when they are left fallow or abandoned. As a result, many of these "old field" habitats (which are the result of human use) are becoming valuable prairie and savannah environments with incredible plant and animal diversity. If human disturbance had not occurred and resulted in agricultural lands, these areas would likely have remained as forests (assuming they were not developed). In addition, prairie and savannah are dynamic natural systems which require disturbances like fire, ploughing or mowing to prevent developing into closed-canopy forest. As a result, grassland habitats can be seen as characterized by disturbance both ecologically and in the context of the Moraine; the fact that respondents in Factor 2 indicated value for this natural feature over all others (including water) suggests an acceptance or appreciation for disturbed environments. ORM25 was sorted in Factor 1, but this participant most strongly agreed with the statement about prairie and grassland and evoked a narrative about the Moraine's past while arguing for the conservation of grassland habitats:

> "The grasslands, with no forests to clear, were easy targets for pioneer farms, but became very poor agriculturally because of the sapping of the fertility from the

> sandy soils. Farmers, on the Moraine's pasture areas, should be encouraged and aided in growing prairie species for part of their livestock's forage. . . . it should also be emphasized that it is not only the plants that are being saved, but the animals, birds and insects that need this habitat to survive (ORM25)."

Perhaps as a result of this acceptance of disturbed landscapes (and tolerance of invasive species), Factor 2 respondents were strongly opposed to deliberate restoration of the large areas of artificial pine plantations on the Moraine, most notably in the Ganaraska and Northumberland County Forests. This group assigned statement 31 (*"we need to replace the old artificial pine plantations on the Moraine with the type of hardwood forest that was there originally – that would bring it back to a more natural state"*) a very low score of -1.953, the second-highest score for this group. This statement was sorted very slightly positively by Factor 1 (0.064) and slightly negative by Factor 3 (-0.882), which in comparison to the very low score of -1.953 are fairly insignificant; however, the artificiality of these pine plantations emerged as a concern several times during interviews, where respondents described the pines as invasive species which were not considered natural. In the context of these strong views, it is surprising that the only strong response to this statement was a negative one. However, it is likely that while respondents in all factor groupings may have considered the plantations invasive or unnatural, forcible removal of such large areas of middle-age trees was not seen as a reasonable response. AsORM27 explained, the pine plantations will "take care of themselves in a few decades." Similarly, in comparison with Factors 1 and 3, Factor 2 indicated strong disagreement (-0.93) with a statement that advocated the need for ecological restoration (s27; *"we need to do some ecological restoration on the Moraine*

to repair the damage and restore it to its original natural state"); in comparison, Factor 1 strongly agreed with this statement (1.039) and Factor 3 moderately agreed (0.583).

Respondents in Factor 2 also strongly disagreed (-1.169) with statement 33, which suggested *"increasing the size and quality of forests on the Moraine"* as a management priority. This strong disagreement is perhaps due to this grouping's interest in prairie habitats, and also perhaps due to a hesitancy to interfere with the intent of reducing human influence on the landscape; Factor 2 respondents strongly indicated their perception of the Moraine as a nature-culture hybrid which can and should be used by humans.

Working Landscape and Use of the Moraine

Perhaps due to a heightened awareness of the disturbed nature of the Moraine, or at the very least due to a tolerance of disturbance on the Moraine, respondents in Factor 2 indicated high value for the human dimensions of the Moraine landscape. Use of the Moraine was not seen as oppositional to its conservation, as statement 12 was sorted highly at 1.07. Similarly, Factor 2 also identified the Moraine as a working landscape for both nature and humans (statement 6; *"the Moraine is both a natural landscape. It's not a nature preserve behind gates – it's a working landscape where people live, work and play"*) with a significantly high score of 1.766. This suggests a dismissal of ideals about 'naturalness,' a sentiment that was explicitly addressed by ORM24 in a comment following their sort:

> "Conservation does not require a return to a 'natural' state. In its natural state, this country alternates between bug-infested oven and frozen wasteland. The former

> drives [humans] mad – the latter simply kills them outright. Nature is neither inherently good, nor inherently evil – it is indifferent. Careful development need not destroy ecosystems – and it can create new ones which are more desirable (ORM24)."

Not only does ORM24 dismiss romanticism of nature (and is in fact quite negative about the relationship between nature and humans in Canada), but this respondent very explicitly refers to the usefulness of ecosystems, suggesting that they can be made "more desirable" to suit human needs. Respondents sorted in Factor 2 further expressed this utilitarian view of the Moraine by indicating high value for recreational and educational uses of the landscape. Statement 24 (*"the Moraine should be managed to allow hiking, education, and other 'soft' public uses that won't cause damage"*) was ranked highly at 1.117. ORM50 argued that uses like education and recreation can facilitate stewardship and ensure long-term protection of the Moraine:

> "If the Moraine truly is for everybody and if there truly is a management body to preserve it then why shouldn't it be managed to allow access, education, [a] source of pride and to instil loyalty to nature. If it is not allowed then how will it be respected? Resistance will abound which will contribute to its demise (ORM50)."

In this statement, ORM50 also suggests that access to the Moraine should be a public right. In a related environmental justice issue, respondents in Factor 2 also expressed concern about the distribution of costs and benefits in the protection of the Moraine. Statement 13 *("if the Moraine is for everybody, let everybody pay for it.*

Because right now it's the landowner who has to bear the burden of Moraine conservation") was ranked very high at 1.427. ORM24 indicated strong concern for the effect of the ORMCP on private landowners, arguing that "thousands of people have invested their lives in their land on the Moraine, only to find that they are denied full use of their own property."

However, while respondents in Factor 2 demonstrated awareness of the negative consequences of the ORMCP on private landowners, they remained strongly supportive of conservation efforts. Like Factors 1 and 3, this group identified urbanization as the most significant threat to the Moraine (statement 11) with a score of 1.613. While this score was significantly less than Factor 1 (2.105) it was significantly more than Factor 3 (-0.46), and it was the fourth-highest score for Factor 2. Other statements relating to urbanization were also scored highly; ORM27 strongly agreed with statement 29 *("the first management priority should be to stop the disturbances so it can become more natural over time"*), explaining that urbanization is "the main cause of disturbance to date." This is to say, despite this factor grouping's emphasis on using the Moraine for human benefit, they strongly identified the need for its conservation.

Factor 3

Like Factor 1, respondents in Factor 3 indicated an awareness of land use planning issues and framed the Moraine in terms of its landscape-scale ecological services. This emphasis did not, however, emerge as strongly as in Factor 1. Instead, respondents in Factor 3 demonstrated greater awareness of the biology of the Moraine, scaling down from the higher-scale biological functions (as prioritized in Factor 1) to a more specific

emphasis on the physical biological interactions 'on the ground'. More specifically, respondents in Factor 3 most highly ranked the importance of the Moraine as a habitat for diverse plants and animals, and engaged very strongly with the statements about invasive species. While this factor grouping accepted that the Moraine is not a pristine environment, they indicated strong support for deliberate restoration and re-naturalization of the Moraine. Significantly, this factor grouping emphasized the interconnectedness between nature and culture, arguing for a 'working landscape' model and suggesting that actively using and managing the Moraine will lead to stewardship and long-term conservation. Unlike Factors 1 and 2, Factor 3 was not highly engaged with land use planning issues on the Moraine, as respondents did identify urbanization as a severe threat to its conservation.

Table 8 - Normalized Q sort for Factor 3. This table represents an average sort for a respondent in this factor grouping.

Strongly Disagree									Strongly Agree	
-5	-4	-3	-2	-1	0	1	2	3	4	5
8	13	22	31	33	20	32	6	19	1	4
	21	34	28	10	2	27	26	12	24	
		36	9	11	35	16	3	5		
			25	29	23	30	14			
				17	15	18				
					7					

Table 9 - Normalized ranking of statements for Factor 3 that had significant scores. This table represents an average sort for a respondent in this factor grouping. Note that high positive scores indicate strong factor agreement, and low negative scores indicate strong disagreement, and that "significant" scores are identified as greater than 1 or less than -1.

Z Scores	Statements
1.692	4) The Moraine contains a variety of healthy and diverse plant and animal habitats.
1.532	1) The Moraine is most valuable as a natural system that filters and replenishes our water supply.
-1.52	8) If we all went away and left the Moraine alone for 100 years it would go back to its natural state.
-1.436	21) Invasive species don't threaten what I value about the Moraine, so I'm not really concerned about them.
-1.44	13) If the Moraine is for everybody, let everybody pay for it. Because right now it's the landowner who has to bear the burden of Moraine conservation.
-1.43	36) There's little hope that invasive species can be wiped out so why fight a losing battle? We shouldn't bother trying to control them.
-1.387	34) Protecting the Moraine means letting it do what it's supposed to do. Just let nature take care of itself.
1.364	24) The Moraine should be managed to allow hiking, education, and other "soft" public uses that won't cause damage.
1.280	19) Let's worry less about how many invasive species there are and more about what they're doing – good or bad.
-1.273	22) The Moraine is already a disturbed landscape, so why bother worrying about invasive species?
1.242	12) I don't see a conflict between preserving the Moraine and trying to use it for human benefit at the same time.
1.162	5) The Moraine is most valuable as a connected landscape- one of the last remaining green corridors in Ontario.
-1.146	25) If you make the Moraine accessible to everyone they're going to cause an awful amount of damage.
-1.136	9) The Moraine is nature at its finest. It's basically untouched by humans- nature in its natural state.

1.159	6) The Moraine is both a natural and a human landscape. It's not a nature preserve behind gates- it's a working landscape where people live, work and play.
1.071	26) The management priority should be protecting the natural services that the Moraine provides, like water filtration. That in turn leads to conservation of everything else.
1.05	3) The Moraine is important because it's so close to urban centers- people shouldn't have to go all the way to Algonquin Park to experience nature.
1.047	14) The conservation policies that protect the Moraine are permanent and quite strong.
-1.021	28) Who says what "belongs" on the Moraine or how it should be restored? If we interfere and start making decisions on behalf of nature, is it really natural anymore?

Engagement with Biological Features of the Moraine

Respondents in Factor 3 perceived the Moraine as important habitat, strongly agreeing (1.692) with statement 4 (*"The Moraine contains a variety of healthy and diverse plant and animal habitat"*).ORM40 explained, "I feel that the main value of the Moraine is its diversity of habitats." While ORM29 was sorted into Factor 1, this respondent strongly agreed with statement 4, and offered the following explanation: "the largest benefit of the Moraine is the biological diversity it supports; the variety indicates overall health and allows for targeted monitoring of various impacts such as studying amphibians for water quality and interior bird species for forest quality. The Moraine is nothing if not an oasis for biodiversity."

While the statement about the Moraine's importance for water (statement 1; *"the Moraine is most valuable as a natural system that filters and replenishes our water supply"*) was ranked as the second-highest (1.532), this sorting was lower than Factor 1 (1.769) and was not sorted as "most strongly agree" by any participants in Factor 3.

However, the importance of water was emphasized in response to statement 26, which suggests that protection of water will result in the protection of 'everything else' *("the management priority should be protecting the natural services that the Moraine provides, like water filtration. That in turn leads to conservation of everything else"*). However, in these responses expressions of value for the Moraine's water-related services are situated within explicitly biological, above-ground features: "by protecting its natural services through tree planting, stream rehabilitation and creation of wetlands, we are not only protecting its natural services as a water filtration system but also contributing to ecological improvements above ground (ORM30)";

> "Water is the most important key feature that is distinct to the Oak Ridges Moraine. Sometimes this is hard to appreciate because much of this is underground and takes place at a scale which is hard to visualize. It is an important feature that affects all living things – people, plants, animals, and the habitats in which they live (ORM45)."

This suggests that Factor 3 respondents recognized the importance of water (perhaps due to the way that the landform is branded by Moraine organizations), but framed the importance of this feature within their own interest in biological services – wetlands, habitats, and other "above ground" features. Perhaps as a result in this interest in biological interactions "on the ground," this factor grouping engaged very strongly with the statements about invasive species.

Respondents sorted in Factor 3 indicated a high level of concern for invasive species, with a score of -1.436 for statement 21 *("invasive species don't threaten what I*

value about the Moraine, so I'm not really concerned about them"). ORM40 most strongly disagreed with this statement, explaining: "I think invasive species are the largest single threat to native diversity. Although I think we have a lot of non-native species that have integrated quite nicely into the ecosystem there are those that have a virulent affect and need to be combated at every turn."

Despite the challenges of eradicating invasive species, this factor grouping disagreed with the idea of 'giving up,' sorting statement 36 (*"there's little hope that invasive species can be wiped out so why fight a losing battle? We shouldn't bother trying to control them"*) as strongly negative. The score for this statement (-1.43) was very similar to that of Factor 1 (-1.46). Similarly, this factor grouping strongly disagreed (-1.273) with the idea that since the Moraine is already disturbed, there's no point in attempting to eradicate invasive species (statement 22). Despite these strong views about fighting invasive species, Factor 3 respondents also viewed invasive species in the context of their negative effects. Statement 19 (*"let's worry less about how many invasive species there are and more about what they're doing – good or bad"*) was strongly agreed with at 1.28, suggesting that these respondents would be willing to take a less militant stance against invasive species if it could be demonstrated that they were participating or contributing to natural systems.

Naturalness

Factor 3 respondents did not perceive the Moraine as a pristine landscape; sorting statement 9 *("The Moraine is nature at its finest. It's basically untouched by humans…"*) very low at -1.574. One respondent most strongly agreed with this statement, confirming

"the Moraine is not pristine untouched nature (ORM35)". In response to this perceived disturbance, this factor grouping engaged strongly with statements about restoration. This Factor grouping appeared to favour very deliberate human interference in repairing natural systems by sorting statement 34 (*"protecting the Moraine means letting it do what it's supposed to do. Just let nature take care of itself"*) very low at -1.387. ORM45 argued that 'letting nature take its course' is not an effective restoration strategy and naively implies that the Moraine could ever be free enough of human influence to "do what it's supposed to do": "if everyone had this mentality, what is the point of any stewardship projects – to simply speed up a long process? I disagree with this statement because it implies that people do not have an effect on the environment and are therefore not responsible for its safekeeping." In this statement, ORM45 also evoked the idea that deliberate human intervention should be part of the re-naturalization of the Moraine; in this case this intervention is justified by belief that humans are responsible for its "safekeeping."Along the same lines of supporting deliberate restoration, Factor 3 respondents rejected the idea that the Moraine will return to its 'natural' state after a certain amount of time. Statement 8 (*"if we all went away and left the Moraine alone for 100 years it would go back to its natural state"*) was strongly disagreed with, with a score of -1.52. Significantly, this was the third-highest sorted statement for this factor grouping, including both positive and negative scores.

Similarly, Factor 3 respondents strongly disagreed (-1.021) with statement 28, which questioned how to determine what "belongs" in the Moraine in the context of its restoration. ORM30 justified their disagreement with this statement by arguing that regardless of uncertainties, restoration is a critical component of protecting the Moraine:

"with continued pressures on the Moraine (i.e. development, climate change, diversion of water), how can we possibly expect the Moraine to preserve and restore itself? Continued restoration efforts are critical if we are to ensure this landscape is protected."

In the comments following the sort, ORM40 further discussed the need to dismiss ideals of the Moraine being separate from human society, and that there is instead a need to take a deliberate and active role in its re-naturalization:

> "I strongly feel that we should not regard the ORM as a pristine ecosystem that cannot be touched. Humans have already put the ecosystem out of balance and we need to fix things when there is an obvious problem. Although with such a high human population in the area we don't have the option of keeping people out but rather to allow them in a safe and ecologically sound manner (ORM40)."

The theme of interconnectedness between nature and culture and the dismissal of the idea that it is possible to manage nature without human influence spilled over into discussions about human use the Moraine.

Working Landscape

Like Factor 2, respondents in Factor 3 also identified the Moraine as a working landscape with a score of 1.159 for statement 6 ("*natural and human landscape. It's not a nature preserve behind gates – it's a working landscape where people live, work and play"*).This statement was sorted consistently high by Factor 3, but no respondents "most strongly agreed" with this statement; however, two respondents who were Non-Loaders most strongly agreed with this statement and provided comments:

> "It's all about balance. My preference would be to have more natural areas in Ontario and the moraine provides important breeding habitat and a corridor for movement of species. The reality is that people are to stay and we need to find ways of managing our relationship with natural, semi-natural or 'green' areas (ORM34)."

> "I agree with this because the Moraine is more than just a beautiful natural landscape – it's a place for human-nature interactions where we can enjoy nature responsibly and where many people rely on the land to sustain their livelihoods. Humans are part of the landscape and that's what makes it so special (ORM39)."

Factor 3 respondents also agreed with those in Factor 2 in the belief that using the Moraine for recreation and other human benefits did not jeopardize its protection: statement 12 *("I don't see a conflict between preserving the Moraine and trying to use it for human benefit at the same time"*) was ranked highly at 1.242. Two Factor 3 respondents most strongly agreed with statement. ORM42 highlighted social justice issues in their argument that the Moraine should be used for human benefit so that the costs of conservation are not unequally distributed: "I strongly believe that in highly urbanized areas it is an unrealistic luxury to have green spaces or conservation lands that are not designed or programmed for some use by the millions of people who live nearby and want and need access to nature."ORM35 argued that because the Moraine is itself a social construct, it is a product of human use and therefore human use is not oppositional to its protection:

> "Nature and culture are never separate. Humans are nature and nature is human. The mere act of identifying something called the Oak Ridges Moraine is therefore a cultural act. The Moraine is a human not a natural construct. 'Human use' is therefore implicated everywhere. As humans have to think about respectful use everywhere, human use that takes place within ecological limits and respects ecological processes while at the same time taking account of social justice and public access questions. The last point is important because we should not create ecological[ly] conserved landscapes that are only reserved for the wealthy (ORM35)."

Once again, ORM35 evokes the idea that perceiving the Moraine as separate from humans neglects the reality of the role of humans in its creation and maintenance, and misses an opportunity to integrate local communities in its conservation in a sustainable way. Furthermore, isolating the Moraine from human use raises social justice questions around access to the landform both for economic use and for those who are not privileged to already live there.

While respondents in this factor grouping were generally in agreement with Factor 2 respondents in their emphasis on working landscapes and connectivity between nature and culture, those sorted in Factor 3 had a nearly polar opposite score to statement 13 *("if the Moraine is for everybody, let everybody pay for it….")*. In stark contrast with Factor 2's score for this statement (1.427), Factor 3 respondents strongly disagreed that everyone should help pay for the costs of protecting the Moraine (-1.44). ORM42 emphasized that conservation as a land use planning process is not always fair to everyone in their explanation to strong disagreement with this statement:

> "I believe this statement suggests that all current landowners should be highly compensated by government for the full development potential of their land. I disagree. I believe that they should be compensated to some degree but land use planning has for decades created some winners and some losers and we cannot begin to try to even out this playing field (ORM42)."

Continuing on the themes of access to and use of the Moraine, this factor grouping agreed with Factor 2 that the Moraine should be managed for hiking, education and other 'soft' human uses (statement 24), with a score of 1.364 for this statement. Similarly, Factor 3 disagreed that making the Moraine accessible to everyone will cause damage (statement 25), with a score of -1.146.

Land Use Planning and Urbanization

Unlike Factors 1 and 2, this factor grouping did not strongly engage with the land use planning theme. In addition to valuing water and advocating for managing to sustain the Moraine's ecological services, Factor 3 respondents also valued the landform as part of a connected greenspace. Statement 5 (*"the Moraine is important as a connected landscape – one of the last remaining green corridors in Ontario")* received a positive score of 1.162. This factor grouping also valued the Moraine for its proximity to urban centers by positively sorting statement 3 (*"The Moraine is important because it's so close to urban centers – people shouldn't have to go all the way to Algonquin Park to experience nature"*). Agreement with this statement demonstrates an awareness of landscape-scale planning and, once again, positions the Moraine in light of its human usefulness. In this case, it is seen as useful due to its proximity for recreation and connection with nature.

Beyond these landscape-scale urban planning considerations, however, Factor 3 respondents did not engage with issues of planning or urbanization. In fact, this factor grouping slightly disagreed (-0.46) to statement 11 which identifies urbanization as the main threat to the Moraine. This view is dramatically different from respondents in Factor 1, who sorted statement 11 at 2.105. In addition, this factor grouping perceived the conservation policies that protect the Moraine to be quite strong and permanent, sorting statement 14 highly at 1.047. Again, this score is dramatically different from Factor 1, who sorted this statement as -1.961, and indicated severe concerns about weak or impermanent conservation policy.

Discussion

Framing the Moraine

Respondents overwhelmingly situated the discourse of the Moraine within the bureaucratic land-use planning process. By emphasizing the planning-scale themes of water and urbanization, respondents engaged heavily in the political process of conserving the Moraine, and emphasized these themes over their own normative-based reasons for valuing the landform. As a public good, framing the Moraine as "the water barrel of Ontario" was a strategic way of uniting public and political interest in conservation. It was also a strategic way of expanding conservation to fit the entire landform, rather than just protecting localized habitats for Species at Risk or other bits and pieces of greenspace, where a political battle would need to be fought for each piece.

As Whitelaw et al. (2008) note, the Moraine has been a unique site of social learning, as Moraine activists have developed the capacity to participate in the bureaucratic process of conservation, though not because wealthy landowners benefited most from Moraine conservation, as suggested by Wekerle et al. (2007). They began as small activist groups focused around different localized issues across the Moraine, but by joining forces and developed expertise in the conservation planning process. In this way, the civil society groups of the Moraine became active contributors to the planning process, even receiving a large sum of Provincial funding for monitoring programs and other initiatives, coordinated through the Oak Ridges Moraine Foundation. Perhaps because this water and land-use planning framing was a product of the movement itself, there was widespread acceptance of this model among respondents.

However, because Moraine legislation encompasses the entire landscape – including private lands – respondents expressed concerns about the distribution of costs and benefits resulting from conservation. Some respondents believed that private landowners on the Moraine were being punished because conservation limited the use of their land. In response to this perceived inequity, some respondents emphasized the importance of developing sustainable local economies and strengthening local communities. The working landscape model is rooted in ideas about sustainability and successful human-nature cohabitation. In the context of the Moraine, however, the idea of the working landscape was framed in the context of repairing inequities caused by conservation, and generating a local resource-based economy which was seen as being impaired by Moraine legislation and "environmentalist" activities. The ORMCA and ORMCP explicitly include provisions for local communities and agricultural lands in particular; in fact, there is a special zoning designation for "Rural Settlements." It is interesting, then, that respondents framed consideration of communities and economies as a "next step," or as an issue that needs addressing. For example, the Stewardship, Livelihoods and Learning conference was heavily themed around local economic development (with presenters from the Township of Cavan Monaghan, Kawartha Choice FarmFresh and the Kawartha Heritage Conservancy's Farmlands Program as part of a "livelihoods" panel). The conference was held in the eastern end of the Moraine, near Peterborough, which organizations identified as a way to target those who are on the "fringe" of the movement and are otherwise left out of activities. A deliberate effort to include those on the fringe of the movement is perhaps part of a process of reconciliation: even though there are strong provisions in the Plan for rural communities and economic

development, there was very negative response to the ORMA and Moraine conservation in general. In addition, the Moraine movement remains branded as ecocentric. Framing the Moraine as a working landscape appears to be the beginning of a process of re-branding to orient the movement toward the pursuit of social, economic and environmental goals, beyond the more commonly cited and "original" goals of fighting urbanization and protecting ecologically significant features. Building trust and addressing perceived past injustices in this way is a key component of effective conservation in complex socio-ecological landscapes, because "public distrust, especially local community distrust, can have severe implications for the quality and durability of natural resource policy decisions (Leahy and Anderson 2008, p. 100)." The importance of a healthy relationship among Moraine stakeholders – particularly the ones who identify themselves as being on the same "side" – is perhaps particularly relevant in advance of the formal ORMCP review, currently scheduled for 2015.

The tensions around the working landscape model suggest that it is experiencing some growing pains during the process of implementation. It is not as widely accepted as the strategy of framing the Moraine as a water-producing landscape, but because it incorporates a wider array of human concerns and attempts to tackle environmental justice issues, it is highly relevant to conservation on such a socially and economically complex landscape. Despite challenges of the working landscape model, it has the potential to be a very effective way of encompassing social as well as environmental issues, which is a critical step towards sustainability as well as implementation of the UNESCO Biosphere Reserve designation.

Conception of Naturalness

Despite emphasis on water, socio-economic development and landscape-scale planning, respondents very strongly engaged with the subjective and value-driven concept of naturalness. In particular, respondents identified the Moraine as natural but believed that its naturalness had been reduced by past human uses and the effects of fragmentation and invasive species. Respondents dismissed the idea of the Moraine as a pristine landscape as a result of this reduction in naturalness. However, the effects of invasive species and past human uses like agriculture were perceived as temporary disturbances that reduce naturalness in the present but will not prevent re-naturalization in the future. Respondents indicated that re-naturalization is a process rather than an end result, and restricting more permanent disturbances like urbanization will ensure that processes of naturalization can continue. As a result, respondents identified these negative effects as significant in the long-term but concluded that they are dwarfed by other threats like urbanization in the present. In this way, reduced naturalness is not seen as significant in the context of larger, structural threats, but is considered problematic in the long term; naturalness of the Moraine does not matter now, but it will in the future. By identifying the temporal context of disturbance, respondents suggested that given enough time in the absence of new disturbance, the Moraine *can* re-naturalize. Some respondents dismissed the proposal that the Moraine could ever return to its original pristine state, and others questioned whether this original state ever existed. Many believed that a full reclamation of naturalness was a function of time and a lack of human interference, yet definition of this restored state remained vague.

Respondents were also hesitant to define what they meant by restoration and how it should occur and remained equally vague regarding the time frame of re-naturalization processes. This suggests that, while respondents valued a return to the authentic natural state of the Moraine, their conception of a re-naturalized landscape was not objective or concrete. They did not conceive of a return to a natural state as evaluated by particular ecological criteria. In this way, respondents perceived reclamation of naturalness as part of a *process* rather than an end result. This perspective is evocative of new ways of thinking about ecosystems, where scientists no longer pursue or idealize static or stationary forms of nature in light of growing understanding of flux and change processes: as Jeffrey and McIntosh (2006) suggest, socio-ecological networks are "a type of change" that can be understood through the analogy of the biological theory of co-evolution. Respondents' conception of naturalness as a non-fixed state also hints at an acceptance of nature-culture coupling (Zimmerer 2000); respondents already rejected idealization of the Moraine as pristine, and accordingly their perception of its return to naturalness is equally nuanced and cognizant of the human role in the landscape.

Significantly, while respondents reflected on past land uses as a valued cultural history, these uses were explicitly identified by most respondents as having a negative effect on the Moraine's naturalness, and were evoked in explanations of why the Moraine is no longer pristine. These effects were considered less permanent and therefore less damaging than urbanization. However, past human uses that respondents identified as reducing naturalness included agriculture and small-scale resource economies – the very uses that were advocated for as part of a working landscape. In this way, a conflict emerged in the conservation values that respondents expressed for the Moraine and the

conceptual models for framing the Moraine that respondents endorsed. Rather than viewing this disconnect as a conflict between preserving and using nature, it is more productive to evaluate whether the working landscape model captures the full range of conservation values held by the civil society engaged in Moraine conservation. In this case, naturalness emerged as a very deep-rooted value among nearly all respondents, in spite of acknowledging that the landform is not pristine. While respondents did not frame the Moraine in terms of its naturalness, it did emerge as an important consideration and source of value, yet the water and working landscape framing fail to include any consideration of naturalness. Based on Bocking's (2005) analysis of the conservation movement, failure to incorporate naturalness in framing the Moraine's value may have been deliberate rather than an oversight: because activists legitimized conservation of the Moraine using science, subjective, value-based engagements with the landform were actively discouraged and repressed. As a loosely defined and normative concept, the importance of protecting the Moraine's naturalness did not carry the same weight as hydrological or urban planning arguments. Presenting a different perspective, McElhinny (2006) suggests the Moraine does not fit into existing aesthetic considerations of what is sublime and worthy of conservation, so activists lacked the discourse to describe their value for it. Regardless of *why* the Moraine movement was not framed in terms of subjective ideals of naturalness, this study found the concept to be highly relevant to respondents. Importantly, respondents also believed that the restoration of naturalness *should* be an outcome of conservation efforts.

Nature-Culture Dichotomy: Apart from and a part of the Moraine

If concepts like naturalness can act as a bridge to exploring how social construction of nature and the nature-culture dichotomy play out on landscapes, how did respondents' conception of the Moraine address these themes?

Both sides of the nature-culture divide were evident in this case study. Respondents indicated value for naturalness, which was overwhelmingly seen as reduced or impaired on the Moraine as the result of human influence. In addition, many respondents believed that naturalness could be restored over time and in the absence of human disturbance. In this way, respondents perceived humans and human activities as a negative influence on the naturalness of nature. Conversely, respondents also endorsed the working landscape model of the Moraine, where human communities are seen as a part of and contributor to ecological communities, and where nature is not held up on a pedestal as a pristine, untouchable and non-human entity. These conflicting perceptions of the relationship between nature and culture are not unusual, and can be seen as both sides of the preservation *vs.* use dichotomy as discussed by Daugstad et al (2006).

These conflicting perspectives were not held by different groups or even different individuals, however: they were held by the *same* individuals, who did not find themselves in conflict by existing on both sides of the nature-culture dichotomy. For example, even respondents who expressed value for idealized nature also dismissed ideas that the Moraine is, was, or ever could be pristine. Similarly, even respondents who emphasized the goal of local economies and communities being supported by sustainable use of the Moraine advocated for conservation of its natural features.

In this way, respondents saw themselves as both apart *from* and a part *of* the Moraine; existing as a part of ecological communities while also retaining value for nature as separate from human influence. Just as the Moraine is a hybrid landscape, so too did respondents identify it as a hybrid between the two divergent sides of the nature-culture divide.

For Moraine activists, then, the distinction between nature and humanized non-nature (Lien 2005) is insignificant. The Moraine is both valued as a site of natural conservation and a site of social production; in this way, respondents do not perceive the ecological values of the Moraine and the human processes that exist within and around it as being binary opposites. Beyond the permanent effects of urban development, respondents did not perceive human influences on the Moraine as constituting the "end of nature" (McKibben 1989); on the contrary, respondents perceived the Moraine as "natural" in spite of past disturbance, and valued the landform for its intrinsic natural qualities. Moraine activists appear to be existing within this paradox with ease; however, tensions remained in consideration of past human influences as reducing naturalness and the hesitancy to vocalize normative arguments of protecting the Moraine in favour of more objective scientific arguments.

Proctor (2001) suggests that such tensions are necessary, because different ways of perceiving both environmental and social issues will always be socially constructed narratives, not truths or untruths, even though they may conflict with each other. In this way, different narratives of perceptions exist as a paradox of being truths and untruths at the same time. Proctor (1998) explains that embracing the paradoxical nature of apparently opposing truths is a way to reconcile socially constructed nature; because it is

socially constructed, it is extremely variable and complex. In this way, acceptance of two conflicting views is better than compromise, which involves diluting each perspective in attempt to reconcile their differences. Similarly, Gibson (2009) cautions against pursuing balance in complex social and ecological environments, because it implies that some level of stasis should be achieved between two opposing interests. He argues:

> "On a planet where human demands on biophysical carrying capacity are already too high and rising, and where billions of people lack material basics, the fundamental trends of growing damage and deepening inequity must be reversed. Balancing won't do that. Because it treats ecology and economy and society as competing priorities, balancing can deliver only compromises and trade-offs. At best our ship will sink more slowly (Gibson 2009)."

Embracing the paradox of valuing nature as nonhuman while at the same time existing within it is perhaps a way of moving beyond the binary distinction between nature and society, existing within a conception of hybrid nature which recognizes "the intimate, sensible and hectic bonds through which people and plants; devices and creatures; documents and elements take and hold their shape in relation to each other in the fabrications of everyday life (Whatmore 2002, p. 3)." More than a way of resolving conflicting tensions, recognition of hybrid nature is an imperative for the North American environmental movement, which Wapner (2010) suggests continues to cling to outdated preferences for pristine nature. Embracing hybridized "postnature," he argues, is a way to reconcile the paradoxes of managing nature and accept the reality of human interconnection with natural systems. In this view, dismissing idealized notions of pure

nature is essential to advance conservation agendas in a world that is increasingly characterized by hybrid nature; there are no frontiers to save from human influence anymore (if such frontiers even existed), and embracing the hybrid character of nature as natural is a necessary step for conservation and for reconciling the human relationship with nature. An integrative approach to coexisting with nature is an ancient principle of many cultures and indigenous peoples, so this approach may represent a return to a previous acceptance of hybrid nature rather than a new concept. Regardless, it is a key requirement for developing a more sustainable interconnected socio-ecological system.

Conclusion

Nature conservation is a complex and socially situated process. The ways in which nature is set aside for protection or managed are a product of highly subjective norms and values. The approach to conservation in Canada is evolving toward valuation of hybrid nature; whether this change is occurring due to growing acceptance of the integration of socio-ecological systems or due to pressures of urbanization and the need for conservation planning is outside the scope of this study. However, findings from this study reinforce the social importance of hybrid or humanized nature, even in the context of significant disturbance. Protecting non-human nature remains an important if rarely articulated priority for Moraine activists, though such subjective, intrinsic value arguments for protecting the Moraine have been deliberately repressed in favour of scientific arguments. Failing to represent this value, however, excludes a key priority for conserving the landform which may contribute to conflicts in the future management of the Moraine.

Existing comfortably within a conservation paradox, activists balanced values for preserving and using the Moraine simultaneously. Following their lead, it is perhaps time that this paradox is more explicitly incorporated into the conservation discourse. Moraine activists represent a framework for valuing the naturalness of hybrid landscapes, but this model has yet to be applied in the discursive ways that the Moraine is framed or in the policy tools that are in place to protect it. Incorporating more value-based considerations of naturalness in future planning, management and framing may aid in the development of a hybrid model for sustainability in the region, where natural and social considerations are considered in relation to rather than in opposition to each other.

Appendix A: Questions for Loosely Structured Interviews

Demographic Information

- In which township, city, or town do you live?
- Do you live on the Moraine? If so, where (approximately)?
- How are you involved with the Moraine?

Conservation Vision

1. Why are you interested in protecting the Oak Ridges Moraine?
2. What do you value most about the Moraine?
3. What is your conservation vision for the Moraine?
4. Does anything threaten what you value about the Moraine?

Defining the Moraine Landscape

5. What natural or landscape features do you believe are most characteristic of the Moraine?
6. What natural functions or services do you believe the Moraine provides (if any)?
7. Do you consider the Moraine to be environmentally pristine?
8. Are forests an important part of the Moraine? Do you consider the Moraine to be an "old growth" forested landscape?
9. Do you consider the Moraine to be a fragmented landscape? (ie. Divided up between different land uses)
10. Do you believe that the Moraine needs to be ecologically restored? Why/why not? If yes, what would you include in an ecological restoration?

11. Studies have found that "balance" and "naturalness" are the most important conservation principles according to the public. Do you agree with these priorities? Do they fit with to your conservation priorities for the Moraine?

People and the Moraine

12. Do you believe that the Moraine should be accessible to everyone? Why/why not?

13. Do you believe that the Moraine *is currently* accessible to everyone?

14. Do economic activities belong on the Moraine? Why/why not/which types?

15. Do you believe that Moraine policies are fair to landowners with property on the Moraine? Why/why not?

16. Do you believe that the costs of conserving the Moraine are shared by everyone?

Invasive Species on the Moraine

Background: What's an invasive species*?* Invasive species are plants or animals that are introduced to an area and case some kind of negative effect, whether to humans (economic, emotional or health effects) or to the environment (ecological effects like competing with native species). Examples include the Emerald Ash Borer, Garlic Mustard, Dog-Strangling Vine and European Buckthorn.

17. Are you aware of the presence of invasive species on the Moraine? If so, are you concerned?

18. Do invasive species "belong" on the Moraine? Why/why not?

19. Would you be in support of management efforts to control invasive species (eg. Spraying herbicides or pesticides, cutting down trees to quarantine invasive insects, etc)? What management actions would be acceptable (if any) and why?

20. Invasive plant and animal species *are* present in the Moraine. Do you believe that the presence of these species makes the Moraine less "natural" or pristine? Please explain why or why not.

Appendix B: List of Coded Free Nodes

- Acknowledgement of the ORM's settled past- not pristine
- Boundaries-geographically defining the Moraine
- caution
- continuous natural~~landform
- Development pressure, threats
- Documents about the ORM
- East, west conflict
- ecology in the moraine
- exploitation
- Farming on the ORM
- Goals of the conservation movement
- Gravel quarrying
- History of the conservation movement
- industry, economic opportunity
- land use designations
- Logging, reforestation, Ganaraska and Northumberland
- Management and Invasive Species
- Management of the Moraine
- Moraine as Urban Wilderness
- Moraine Integrity
- natural heritage features
- Naturalness of the Moraine
- precious
- pristine
- resiliency
- Restoration
- Restoration and invasive species
- Romanticism
- Scientific facts about the ORM
- Smart Growth
- sprawl
- struggling centers
- the Moraine as a landscape, landform
- Threats to the ORM
- Use of the Moraine, working landscape
- Valuation of the Moraine
- water in the moraine
- We need to protect the ORM
- What is the Moraine
- What's next for the Moraine
- Why people get involved, motivations
- Why we need to protect the ORM, importance of the ORM

References

Anderson, D. G., & Berglund, E. K. (2003). *Ethnographies of conservation: Environmentalism and the distribution of privilege*. New York: Berghahn Books.

Bischof, B. G. (2010). Negotiating uncertainty: Framing attitudes, prioritizing issues, and finding consensus in the coral reef environment management. *Ocean & Coastal Management,* 53(10), 597-614.

Bocking, S. (2004). *Nature's experts: Science, politics, and the environment*. New Brunswick: Rutgers University Press.

Bocking, S. (2005). Protecting the rain barrel: Discourses and the roles of science in a suburban environmental controversy. *Environmental Politics, 14*(5), 611-628.

Born, R. J. G., Lenders, R. H. J., De Groot, W. T., & Huijsman, E. (2001). The new biophilia: An exploration of visions of nature in western countries. *Environmental Conservation, 28*(1), 65-75.

Bradford, A. (2008). Water policy for ecosystem integrity: Oak ridges moraine conservation plan, Ontario, Canada. *Water International, 33*(3), 320-332.

Braun, B., & Castree, N. (2001). *Social nature: Theory, practice, and politics.* Malden: Blackwell.

Brown, S. R. (1980). *Political subjectivity: Applications of Q methodology in political science*. New Haven: Yale University Press.

Brunson, M. W. (2000). Managing naturalness as a continuum: Setting limits of acceptable change. In P. H. Gobster, & R. B. Hull (Eds.), *Restoring nature: Perspectives from the social sciences and humanities,* (pp. 190-244). Washington, D.C.: Island Press.

Buijs, A. E. (2009). Lay people's images of nature: Comprehensive frameworks of values, beliefs, and value orientations. *Society and Natural Resources, 22*(5), 417-432.

Burns, M., & Cheng, A. S. (2007). Framing the need for active management for wildfire mitigation and forest restoration. *Society & Natural Resources, 20*(3), 245-259.

Castree, N. (2001). Socializing nature: Theory, practice and politics. In N. Castree & B. Braun. *Social nature: Theory, practice and policies,* (pp.1-21). Malden*:* Blackwell.

Castree, N. (2004). Nature is dead! Long live nature! *Environment and Planning A, 36*(2), 191-194.

Colautti, R. I., & MacIsaac, H. J. (2004). A neutral terminology to define 'invasive' species. *Diversity & Distributions, 10*(2), 135-141.

Cosgrove, D. (1984). *Symbolic landscape and social formation*. London: Croom Helm.

Cronon, W. (1996). The trouble with wilderness: Or, getting back to the wrong nature. *Environmental History, 1*(1), 7-28.

Daugstad, K., Svarstad, H., & Vistad, O. I. (2006). A case of conflicts in conservation: Two trenches or a three-dimensional complexity? *Landscape Research, 31*(1), 1-19.

Dearborn, D. C., & Kark, S. (2010). Motivations for conserving urban biodiversity. *Conservation Biology, 24*(2), 432-440.

Demeritt, D. (2001). Being constructive about nature. In N. Castree & B. Braun. *Social Nature: Theory, practice, and politics,* (pp. 22-40). Malden*:* Blackwell.

Duncan, J., & Duncan, N. (2004). *Landscapes of privilege: The politics of the aesthetic in an American suburb.* New York: Routledge.

Escobar, A. (1999). After nature: Steps to an antiessentialist political ecology. *Current Anthropology, 40*(1), 1-30.

Filion, P. (2001). Suburban mixed-use centres and urban dispersion: What difference do they make? *Environment and Planning A 33*(1), 141-160.

Fischer, A., & van der Wal, R. (2007). Invasive plant suppresses charismatic seabird - the construction of attitudes towards biodiversity management options. *Biological Conservation, 135*(2), 256-267.

Fisher, J. R., & Alexander, D. H. M. (1993). The symbolic landscape of the oak ridges moraine: Its influence on conservation in Ontario, Canada. *Environments: A Journal of Interdisciplinary Studies, 22*(1), 100.

Fisher, J., Helleiner, F. M., & Wehrenberg, K. (1991). Greenways and green space on the Oak Ridges Moraine: Towards co- operative planning. *Occasional Paper - Trent University, 14*.

Foster, J. (2010). Landscape continuity: Ecology, power and social order in environmental planning. *Planning Theory & Practice, 11*(2), 167-186.

Foster, J., & Sandberg, L. A. (2004). Friends or foe? Invasive species and public green space in Toronto. *Geographical Review, 94*(2), 178-198.

Gibson, R. B. (2009). What's the big idea? Balance. *Alternatives, 35*(4).

Gilbert, L., Sandberg, L. A., & Wekerle, G. R. (2009). Building bioregional citizenship: The case of the oak ridges moraine, Ontario, Canada. *Local Environment, 14*(5), 387-401.

Gobster, P. H. (2000). Restoring nature: Human actions, interactions, and reactions. In P. H. Gobster, & R. B. Hull (Eds.), *Restoring nature: Perspectives from the social sciences and humanities* (pp. 1-19). Washington, D.C.: Island Press.

Gobster, P. H. (2005). Invasive species as ecological threat. *Ecological Restoration, 23*(4), 261.

Gobster, P. H., & Barrow, S. C. (2000). Negotiating nature: Making restoration happen in an urban park context. In P. H. Gobster, & R. B. Hull (Eds.), *Restoring nature: Perspectives from the social sciences and humanities* (pp. 189-207). Washington, D.C.: Island Press.

Government of Canada. (2009). *Invasive species in Canada.* Retrieved 12/1, 2010, from http://www.invasivespecies.gc.ca.

Oak Ridges Moraine Conservation Act, (2002). Queen's Printer for Ontario: Toronto.

Oak Ridges Moraine Conservation Plan, (2002). Queen's Printer for Ontario: Toronto.

Hanna, K., & Webber, S. (2010). Incremental planning and land-use conflict in the Toronto region's Oak Ridges Moraine. *Local Environment, 15*(2), 169-183.

Hanna, K. S., Webber, S. M., & Slocombe, D. S. (2007). Integrated ecological and regional planning in a rapid-growth setting. *Environmental Management, 40*(3), 339-348.

Haughton, G., & Counsell, D. (2004). *Regions, spatial strategies, and sustainable development.* Sussex: Psychology Press.

Head, L., & Muir, P. (2006). Suburban life and the boundaries of nature: Resilience and rupture in Australian backyard gardens. *Transactions of the Institute of British Geographers, 31*(4), 505-524.

Hull, R. B., Robertson, D. P., & Kendra, A. (2001). Public understandings of nature: A case study of local knowledge about" natural" forest conditions. *Society & Natural Resources, 14*(4), 325-340.

Hurley, P. T., & Walker, P. A. (2004). Whose vision? conspiracy theory and land-use planning in Nevada County, California. *Environment and Planning A, 36*(9), 1529-1547.

Jeffrey, P., & Mcintosh, B. S. (. (2006). Description, diagnosis, prescription: A critique of the application of co-evolutionary models to natural resource management. *Environmental Conservation, 33*(4), 281-293.

Jordan, W. R. (2000). Restoration, community, and wilderness. In P. H. Gobster, & R. B. Hull (Eds.), *Restoring nature: Perspectives from the social sciences and humanities* (pp. 23-36). Washington, D.C.: Island Press.

Kendle, A., & Rose, J. (2000). The aliens have landed! what are the justifications for 'native only' policies in landscape plantings? *Landscape and Urban Planning, 47*(1-2), 19-31.

Kirkham, W. S. (2004). Situating the *merremia peltata* invasion in Samoa. *Geographical Review, 94*(2), 218-228.

Knights, P. (2008). Native species, human communities and cultural relationships. *Environmental Values, 17*(3), 353-373.

Lach, D., List, P., Steel, B., & Shindler, B. (2003). Advocacy and credibility of ecological scientists in resource decisionmaking: A regional study. *Bioscience, 53*(2), 170-178.

Landres, P. B., Brunson, M. W., Merigliano, L., Sydoriak, C., & Morton, S. (2000). Naturalness and wildness: The dilemma and irony of managing wilderness. *DN Cole, SF McCool, W. T. Borrie, & J. O'Loughlin (Comps.), Wilderness Science in a Time of Change Conference 5,* 377-381.

Larson, B. M. H. (2007). Who's invading what? systems thinking about invasive species. *Canadian Journal of Plant Science, 87*(5), 993-999.

Leopold, A. (1949). *A sand county almanac and sketches here and there*. New York: Ballantine.

Lien, M. (2005). 'King of fish' or 'feral peril': Tasmanian Atlantic salmon and the politics of belonging. *Environment and Planning D-Society & Space, 23*(5), 659-671.

Light, A. (2000). Ecological restoration and the culture of nature: A pragmatic perspective. In P. H. Gobster, & R. B. Hull (Eds.), *Restoring nature: Perspectives from the social sciences and humanities* (pp. 49-70). Washington, D.C.: Island Press.

Lister, N., & Kay, J. J. (2000). Celebrating diversity: Adaptive planning and biodiversity conservation. In S. Bocking (Ed.), *Biodiversity in Canada: Ecology, Ideas, and Action.*, 189–218. New York: Ballantine.

Lister, N. M. E. (2008). Bridging science and values: The challenge of biodiversity conservation. In D. Waltner-Toews, J. J. Kay & N. M. E. Lister (Eds.), *The*

ecosystem approach: Complexity, uncertainty, and managing for sustainability (pp. 83-108). New York: Columbia University Press.

Lockwood, J., Hoopes, M., & Marchetti, M. (2007). *Invasion ecology*. Malden: Blackwell.

Lodge, D. M., Leung, B., Williams, S., MacIsaac, H. J., Hayes, K. R., Reichard, S., et al. (2006). Biological invasions: Recommendations for U.S. policy and management. *Ecological Applications, 16*(6), 2035-2054.

Logan, S., & Wekerle, G. R. (2008). Neoliberalizing environmental governance? land trusts, private conservation and nature on the oak ridges moraine. *Geoforum, 39*(6), 2097-2108.

MacEachern, A. Rationality and rationalization in Canadian national parks predator policy. In C. Gaffield and P. Gaffield (Eds.), *Consuming Canada: Readings in Environmental History* (pp. 197–212). Mississauga: Copp Clark.

Mack, R. N., Simberloff, D., Lonsdale, W. M., Evans, H., Clout, M., & Bazzaz, F. A. (2000). Biotic invasions: Causes, epidemiology, global consequences, and control. *Ecological Applications, 10*(3), 689-710.

MacKenzie, S. H. (1996). *Integrated resource planning and management: The ecosystem approach*. Washington, D.C.: Island Press.

McElhinny, B. (2006). Written in sand. *Critical Discourse Studies, 3*(2), 123-152.

McKeown, B., & Thomas, D. (1988). *Q methodology. Thousand Oaks:* Sage Publications.

McKibben, W. (1989). The death of nature. *New York: Doubleday,*

Merchant, C. (1992). *Radical ecology: The search for a livable world*. New York: Routledge.

Monitoring the Moraine. (2007). *About the MTM project.* Retrieved 8/15, 2010, from http://www.monitoringthemoraine.ca/AboutMTM/AboutMTM.htm

National Invasive Species Information Center. (2009). *What is an invasive species?* Retrieved 12/1, 2010, from http://www.invasivespeciesinfo.gov.ca/whatis.shtml

Poncelet, E. C. 2001. "A kiss here and a kiss there": Conflict and collaboration in environmental partnerships. *Environmental Management 27*(1), 13-25.

Pond, David. 2009. Institutions, political economy and land-use policy: greenbelt politics in Ontario. *Environmental Politics 18*(2), 238-56.

Proctor, J. D. (2001). Solid rock and shifting sands: The moral paradox of saving a socially-constructed nature. In N. Castree & B. Braun. *Social nature: Theory, practice and policies*, (pp. 225-238). Malden*:* Blackwell Publ.

Proctor, J. D. (. (1998). The social construction of nature: Relativist accusations, pragmatist and critical realist responses. *Annals of the Association of American Geographers, 88*(3), 352-376.

Pyne, S. J. (1998). *How the canyon became grand: A short history.* New York: Viking Press.

Robbins, P. (2004). Comparing invasive networks: Cultural and political biographies of invasive species. *The Geographical Review, 94*(2), 139-156.

Sandberg, L. A., & Wekerle, G. (2009). Reaping nature's dividends: The neoliberalization and gentrification of nature on the oak ridges moraine. *Journal of Environmental Policy & Planning, ifirst*, 1-17.

Sexton, N., Swann, E., & Burkardt, N. (2008). *Stakeholder evaluation for Canaan Valley National Wildlife Refuge.* United States Fish and Wildlife Service.

Sickler, J., Fraser, J., Webler, T., Reiss, D., Boyle, P., Lyn, H., et al. (2006). Social narratives surrounding dolphins: Q method study. *Society & Animals: Journal of Human-Animal Studies, 14*(4), 351-382.

Swart, J. A. A., van der Windt, H. J., & Keulartz, J. (2001). Valuation of nature in conservation and restoration. *Restoration Ecology, 9*(2), 230-238.

Swedeen, P. (2006). Post-normal science in practice: A Q study of the potential for sustainable forestry in Washington State, USA. *Ecological Economics, 57*(2), 190-208.

Takacs, D. (1996). *The idea of biodiversity: Philosophies of paradise. Baltimore:* Johns Hopkins University Press.

Taylor, L. (Forthcoming). Local area planning and global environmental imaginaries. In S. J. Kiss, F. Brammer & T. D. Kremser (Eds.), *Green Dominion? The Politics of the Canadian Environment.*

Tole, L. (2008). Changes in the built vs. non-built environment in a rapidly urbanizing region: A case study of the Greater Toronto Area. Computers, Environment and Urban Systems 32, 355–364.

Tomalty, R. (2009). The ecology of cities. *Alternatives 35*(4), 18-21.

Trigger, D. S., Toussaint, Y., & Mulcock, J. (2010). Ecological restoration in Australia: Environmental discourses, landscape ideals, and the significance of human agency. *Society & Natural Resources, 23*(11), 1060-1074.

van Eeten, M. V. (2000). Recasting environmental controversies: A Q study of the expansion of Amsterdam airport. In H. Addams, & J. Proops (Eds.), *Social discourse and environmental policy: An application of Q methodology.* (pp. 41-70). Northampton: Edward Elgar.

Vogel, J., & Lowham, E. (2007). Building consensus for constructive action: A study of perspectives on natural resource management. *Journal of Forestry, 105*(1), 20-26.

Walker, B., & Salt, D. (2006). *Resilience thinking.* Washington: Island Press.

Wallington, T. J., Hobbs, R. J., & Moore, S. A. (2005). Implications of current ecological thinking for biodiversity conservation: A review of the salient issues. *Ecology and Society, 10*(1), 15.

Waltner-Toews, D., Kay, J. J., & Lister, N. M. E. (2008). *The ecosystem approach: Complexity, uncertainty, and managing for sustainability*. New York: Columbia University Press.

Wapner, P. (2010). *Living through the end of nature the future of American environmentalism*. Cambridge: MIT Press.

Webler, T., Danielson, S., Tuler, S., Kalof, L., & Shockey, I. (2009). Using Q method to reveal social perspectives in environmental research. *Greenfield: Social and Environmental Research Institute, 1-55.*

Wekerle, G., Sandberg, L. A., Gilbert, L., & Binstock, M. (2007). Nature as a cornerstone of growth: Regional and ecosystems planning in the greater golden horseshoe. *Canadian Journal of Urban Research, 16*(1), 20-38.

Whatmore, S. (2002). *Hybrid geographies: Natures, cultures, spaces.* Thousand Oaks: Sage Publications.

Whatmore, S., & Boucher, S. (1993). Bargaining with nature: The discourse and practice of "environmental planning gain." *Transactions of the Institute of British Geographers, 18*(2), 166-178.

Whitelaw, G. S., Eagles, P. F. J., Gibson, R. B., & Seasons, M. L. (2008). Roles of environmental movement organisations in land-use planning: Case studies of the Niagara escarpment and Oak Ridges Moraine, Ontario, Canada. *Journal of Environmental Planning and Management, 51*(6), 801-816.

Woods, M., & Moriarty, P. V. (2001). Strangers in a strange land: The problem of exotic species. *Environmental Values, 10*(2), 163-191.

Woolley, J. T., & McGinnis, M. V. (2000). The conflicting discourses of restoration. *Society & Natural Resources, 13*(4), 339-357.

Zimmerer, K. S. (2000). The reworking of conservation geographies: nonequilibrium landscapes and nature-society hybrids. *Annals of the Association of American Geographers, 90*(2), 356-369.