

**Towards Understanding the Development of Connectedness-to-Nature, and its Role in
Land Stewardship Behaviour.**

by

Zachary Bogdon

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Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis including any required final revisions, as accepted by my examiners.

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Abstract

Exploitation of natural resources for human consumption and development has led to widespread loss of habitat and biodiversity. To address this issue, policy has largely focused on protecting large parcels of public land. However, a purely public approach has proven insufficient at addressing the issue, which is exacerbated in densely populated areas such as southern Ontario. The recognition that public lands alone are unable to address land conservation issues has led to widespread acceptance that private land conservation is required to compliment existing public efforts.

Given the relatively recent focus on private land conservation in most jurisdictions, fairly little is known about private landowner conservation behaviour. Traditional social-psychological models have been applied to understand general pro-environmental behaviours with mixed results. Connectedness-to-nature theory has also been applied towards understanding various pro-environmental behaviours, but has not focused on land-conservation behaviour specifically. Using a grounded theory approach, this thesis explores which factors might lead to the development of connectedness-to-nature. Further, this study explores the role that connectedness-to-nature plays in explaining land conservation behaviour.

Three major interconnected categories emerged from analysis and interpretation. First, unstructured time spent in nature, and guidance from mentors may be important factors in the development of connectedness-to-nature. Second, landowners who feel connected to nature may be more inclined to see conservation as a land use priority. Finally, results suggest that landowners have strong, affective relationships with nature as it exists on their land developed over time, beginning with the initial rural lifestyle decision.

Results suggest that land conservation behaviours are complex and represent specific types of pro-environmental behaviours. Connectedness-to-nature alone may be insufficient at explaining land conservation behaviours. Applying and integrating various social-psychological models that have been previously applied to general pro-environmental behaviours may further our understanding of land conservation behaviour.

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Table of Contents

Author’s Declaration	ii
Abstract	iii
Acknowledgements.....	iv
Table of Figures	vii
1.0 Introduction	1
1.1 Statement of the Problem	1
1.2 Purpose and Objectives	4
1.3 Conceptual and Theoretical Framework.....	4
1.4 Research Scope	5
1.5 Overview of Thesis.....	6
2.0 Literature Review	8
2.2 Regulatory Approach.....	11
2.3 Economic Incentives	12
2.4 A Social-Psychological Approach.....	13
2.5 Norm-Activation Theory	14
2.6 Values-Beliefs-Norms	15
2.7 Theory of Planned Behaviour.....	15
2.8 Connectedness-to-Nature	17
2.9 Developing Connectedness-to-Nature.....	20
2.10 Key Gaps.....	23
3.0 Methods and Materials	24
3.1 Methodological Approach	24
3.2 Social Constructivism.....	24
3.3 Constructivist Grounded Theory	25
3.4 Study Location and Characteristics.....	25
3.5 Phase 1: Survey.....	26
3.6 Phase 2: Interviews	29
3.7 Ethics.....	29
3.8 Interviewee Selection.....	30
3.9 Interview Structure.....	32
3.10 Grounded Theory Analysis.....	32
3.11 Coding.....	33
3.12 Memos.....	33
3.13 Constant Comparison	34
3.14 Sorting	34
3.15 Limited Theory Development.....	35
3.16 Ensuring Quality in Qualitative Research.....	35
3.17 Summary.....	36
4.0 Results and Analysis.....	37
4.1 Developing Connectedness-to-Nature.....	37
4.1.1 Exposure to and Experiences in Nature	38
4.1.2 Having a Mentor	42

4.2 Discussion: Developing Connectedness-to-Nature.....	44
4.3 Results: Exploring Individual Meanings of Connectedness-to-Nature.....	48
4.4 Discussion: Exploring Individual Meanings of Connectedness-to-Nature.....	50
4.5 Results: The Effect of Connectedness-to-Nature on Conservation Attitudes.....	51
4.6 Discussion: The Effect of Connectedness on Conservation Attitudes.....	57
4.7 Results: The Effect of Connectedness-to-Nature on Conservation Activity.....	59
4.8 Discussion: The Effect of Connectedness-to-Nature on Conservation Activity.....	62
4.9 Results: The Rural Landownership Decision.....	64
4.9.2. Personal Enjoyment and Quality of Life.....	66
4.9.3. Witnessing Negative Environmental Change.....	68
4.10 Discussion: The Rural Landownership Decision.....	69
4.11 Analysis Summary.....	72
4.6 Key Findings.....	73
5.0 Integrated Discussion.....	74
5.1 Developing Connectedness-to-Nature.....	74
5.2 The Effect of Connectedness-to-Nature on Conservation Attitudes and Behaviour.....	76
5.3 Re-Evaluating the Connectedness-to-Nature Scale.....	79
5.4 Theoretical Land Conservation Behaviour Model.....	82
5.7 Planning Implications: Conservation Program Design.....	87
5.8 Planning Implications: Urban Green Space.....	90
6.0 Limitations.....	94
6.1 Areas for Future Research.....	95
7.0 Conclusion.....	97
References.....	100
Appendix A.....	109
Appendix B: Interview Questions.....	110

Table of Figures

<i>Figure 1: Land tenure Ontario</i>	1
<i>Figure 2: Population density Ontario, 2011</i>	9
<i>Figure 3: Values-beliefs-norms theory (Stern et al. 1999)</i>	14
<i>Figure 4: Theory of planned behaviour (Ajzen, 1991)</i>	15
<i>Figure 5: Participant information</i>	30
<i>Figure 6: Effects of high and low connectedness-to-nature on conservation attitudes</i>	56
<i>Figure 7: Development of connectedness-to-nature and effect on land conservation</i>	74
<i>Figure 8: Theoretical model of land conservation grounded in the data</i>	81

1.0 Introduction

1.1 Statement of the Problem

The negative impacts that human population growth, industrialization, urban expansion, and land development have caused the natural environment have never been more apparent than they are today. Loss of biodiversity due to habitat clearing for human use is a pressing issue facing current society. To address these issues, programs and policies have largely focused on conservation of public land. However, wildlife and biodiversity conservation professionals have recently shifted from an initial focus on publicly protected landscapes (e.g. wildlife refuges, management areas, etc.) to the conservation of private lands (Ciuzio et al. 2013). Conservation of public land has proven effective at conserving large parcels of important native habitat, but raises ecological issues such as connectivity. This problem is exacerbated in heavily populated areas such as southern Ontario, where the majority of land is held by private landowners (figure 1)

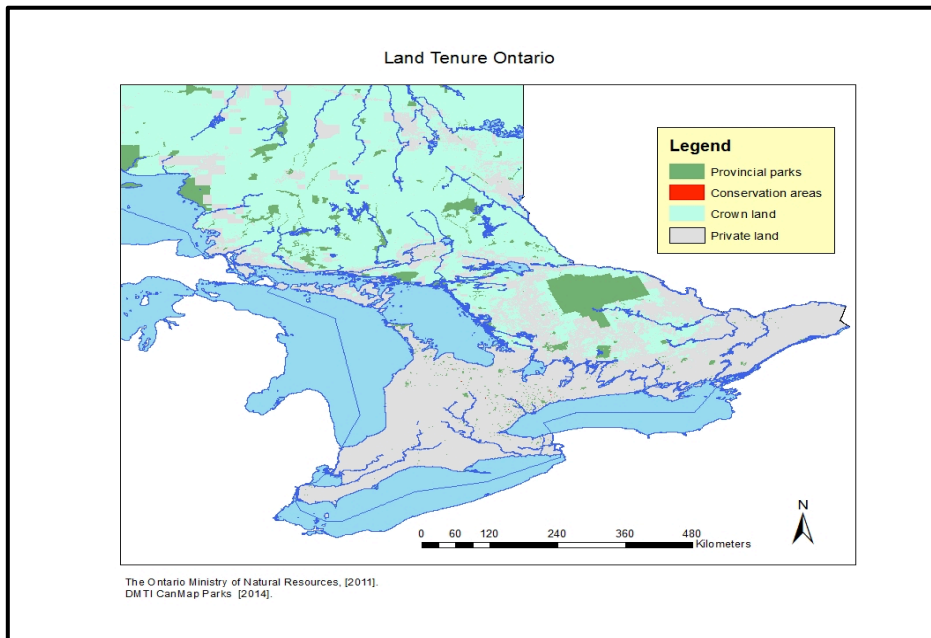


Figure 1: Land tenure in Ontario

Compared to conservation efforts focused on public lands, private land conservation raises unique challenges. For example, individual landowners vary greatly in their land-use behaviours and motivations. While economic incentives and regulatory approaches are widely applied to help increase conservation efforts on private land, the efficiency and effectiveness of such programs is often debated (Kammin et al. 2009; Armsworth et al. 2012). Further, evidence supporting the ability of such programs to change long-term behaviour is sparse.

Land conservation activities represent a specific type of pro-environmental behaviour, which can be described as behaviours that are environmentally friendly or reduce the negative impact that humans have on the environment, including land conservation (Kollmuss and Agyeman, 2002, P. 240). Traditionally, social-psychological models such as norm activation theory (Schwartz, 1977, values-beliefs-norms theory (Stern et al. 1999), and the theory of planned behaviour (Ajzen, 1991) have been used to explain pro-environmental behaviour. However, such models leave much variation unexplained. More recent studies (Schultz, Schriver, Tabanico, and Khazian, 2004; Mayer and Frantz, 2004; Gosling and Williams, 2010; Raymond, Brown, and Robinson 2011) have utilized the emerging construct of connectedness-to-nature to provide alternative explanations of pro-environmental behaviours. However, research has neglected to focus on the factors that might lead to the development of connectedness-to-nature and the role it plays in relation to

the expression of land conservation behaviour. To address this gap, this research focuses on furthering the understanding of connectedness-to-nature theory, and its application towards explaining private landowner conservation behaviour.

Little is known about land conservation attitudes of Ontario private landowners, and the influence that connectedness-to-nature might play on land conservation attitudes and behaviours. In Ontario, farmers own approximately 3,642,170 hectares of land (Statistics Canada, 2006). However, the number of active farms has been slowly decreasing over time, often due to the expansion of suburban development and an increase in amenity or lifestyle migration (Cooke et al. 2015). As well, the land that is not used for agriculture is of much higher importance from a conservation point of view, than the agricultural land itself. But while much research has focused on understanding conservation behaviours on working landscapes (i.e. Gosling and Williams, 2010; Raymond et al. 2011), much less has focused on the conservation behaviours of non-farming rural landowners. Therefore, this research attempts to contribute to a more complete view of private land conservation behaviour by focusing on rural, non-farming landowners, or on management of non-farm land portion of lands in possession of farming rural landowners.

Previous research on connectedness-to-nature has applied quantitative methods to develop and test tools to measure connectedness-to-nature. Consequently, this research can be seen as primarily inductive, providing depth through the qualitative approaches, but also breadth in a sense the open ended nature of interviews allows for divergence of data from that collected through highly structured quantitative instruments.

1.2 Purpose and Objectives

The purpose of this study is to apply connectedness-to-nature theory to create an exploratory model of land private land conservation behaviour informed by the perspectives of land stewards themselves. The objectives of the study are three-fold:

1. To understand what factors lead to the development of connectedness-to-nature.
2. To understand what role connectedness-to-nature plays in the expression of land conservation behaviours as specific types of pro-environmental behaviours.
3. To develop an exploratory model of land conservation behaviour in Ontario landowners.

1.3 Conceptual and Theoretical Framework

The initial conceptual framework adopted for this research is connectedness-to-nature theory, which states that people are more likely to protect nature if they feel they are a part of it (Mayer and Frantz, 2004). Connectedness-to-nature has a long history in writings in ecology (Leopold, 1949), and ecopsychology (Roszak, 1995; 2001), and has since evolved to be the focus of a substantial number of empirical studies (e.g. Schultz, 2001; Mayer and Frantz, 2004; Nisbet, Zelenski, and Murphy, 2009; Gosling and Williams, 2010; Raymond, Brown, and Robinson, 2011). Further, numerous scholars have attempted to develop different tools to measure connectedness-to-nature, including the environmental value

orientations scale (Stern and Dietz, 1998), the emotional affinity towards nature scale (Kals, Schumacher, and Montada, 1999), the inclusion of nature in the self scale (Schultz, 2002), and the implicit associations test (Schultz, Shriver, Tabanico, and Khazian, 2004). This study employed connectedness-to-nature as measured by the connectedness-to-nature scale (Mayer and Frantz, 2004). To date, various theoretical models have been developed and applied to understanding pro-environmental behaviours. However, pro-environmental behaviours are wide-ranging and complex (Lucas, Brooks, Darnton, and Jones, 2008). Given the exploratory nature of this research, a more comprehensive theoretical framework that utilizes elements from multiple social-psychological theories is presented in the discussion (Chapter 5).

1.4 Research Scope

This study is part of a much larger research project led by Dr. Michael Drescher from the School of Planning at the University of Waterloo, and builds on a previous study that focused on individual experiences of conservation behaviour (Drescher, 2014). The research project as a whole has received funding from the Social Sciences and Humanities Research Council of Canada (SSHRC), and is well suited to the focus of the SSHRC priority area ‘Canadian Environmental Issues’. More specifically, the scope of this particular study includes understanding the development and role of connectedness-to-nature on land conservation behaviour of landowners in the geographic area of southern and central Ontario, Canada.

1.5 Overview of Thesis

Including this introductory chapter providing a contextual background of the research problem, objectives, theoretical framework, and definitions of key terms, this thesis includes seven chapters. The proceeding chapters include a literature review in chapter 2, while methods and materials are explained in chapter 3. Chapter 4 includes an integration of main findings and discussion. An integrated discussion, theoretical model, and implications for the practice of conservation planning are presented in chapter 5. Chapter 6 offers a conclusion to the research. Finally, chapter 7 includes limitations and directions for future research.

1.6 Definition of Key Terms

Connectedness-to-nature: Affective relationship with nature; the degree to which a person feels he/she is a part of nature. This study uses the connectedness-to-nature scale as developed by Mayer and Frantz (2004) to measure the construct of connectedness-to-nature (appendix A).

Pro-environmental behaviour: A broad term used to describe behaviours that are environmentally friendly or reduce the negative impact that humans have on the environment, including land conservation. (Kollmuss and Agyeman, 2002, P. 240).

Land stewardship: The responsible use (including conservation) of natural resources in a way that takes full and balanced account of the interests of society, future generations, and other species, as well as of private needs, and accepts significant answerability to society (Worrell and Appleby, 2000).

Ecosystem goods and services: Ecosystem processes or functions that contribute to human wellbeing (Polasky, Nelson, Pennington and Johnson, 2011). Examples include pollination of plants, mitigation of flood, purification of water, carbon cycling, and other complex natural cycles (Brown, Bergstrom, and Loomis, 2007).

2.0 Literature Review

2.1 Private Land Conservation

The conversion of natural habitat for human use is currently one of the leading challenges facing biodiversity on a global scale. The exploitation of natural resources causing habitat destruction and loss of ecosystem richness has led biodiversity conservation to become one of the most important sectors in environmental policy (Paloniemi and Tikka, 2008). To date, much attention has been given to land conservation in the public realm. Often, the most environmentally significant lands are set aside by government to be protected in the form of national parks, provincial parks, or conservation areas. Indeed, conservation of public lands has proven successful at preserving Canada's most treasured natural landscapes.

Although a traditional, public approach to biodiversity conservation is necessary for protecting large parcels of special ecological concern, governments simply cannot afford to purchase every parcel of land that warrants conservation (Stein, Carr, McRoberts, Mahal, and Comas, 2010), and local municipalities prefer lands to be maintained by the private sector to generate important tax revenues for the community (Gustanski and Squires, 2000).

Purely public conservation efforts also raise issues of connectivity, with large parcels of protected landscapes separated by individually owned private parcels of land (Kamal,

Grodzinksa-Jurczak, and Kaszynska, 2015). Further, this has led to growing recognition that conservation strategies aimed only at public land are insufficient for the long-term protection of biodiversity (Knight and Cowling, 2007; Lanholz and Krug 2005). For these reasons, private land conservation is emerging as a leading biodiversity conservation strategy on a global scale for its ability to compliment existing public land conservation (Kamal et al. 2015). Overall, the acceptance of private land strategies for biodiversity conservation appears to be increasing even as homogenous, connected landscapes are shrinking (Mir and Dick, 2012). Additionally, alternative strategies to public conservation approaches can help gain public support for conservation in light of distrust in government intervention (Keiter, 2003; Logan and Wekerle, 2008).

Private land conservation presents unique challenges. In most situations, native species are mobile, migrating across property lines, and will reside on suitable habitat whether it exists on private or public property. For instance, Stein et al. (2010) estimate that 85% of the United States' federally listed species occur on private land. Although this statistic is geographically specific to the United States, it indicates the importance of private land for biodiversity conservation. The predominance of privately held land in Ontario creates a mosaic of uncoordinated land management, with private landowner intentions and practices relatively unknown (Mir and Dick, 2012). Such issues are exacerbated in more populated areas, such as southern Ontario where population is greater, parcel size is smaller, and

natural areas are fewer. (Figure 2)

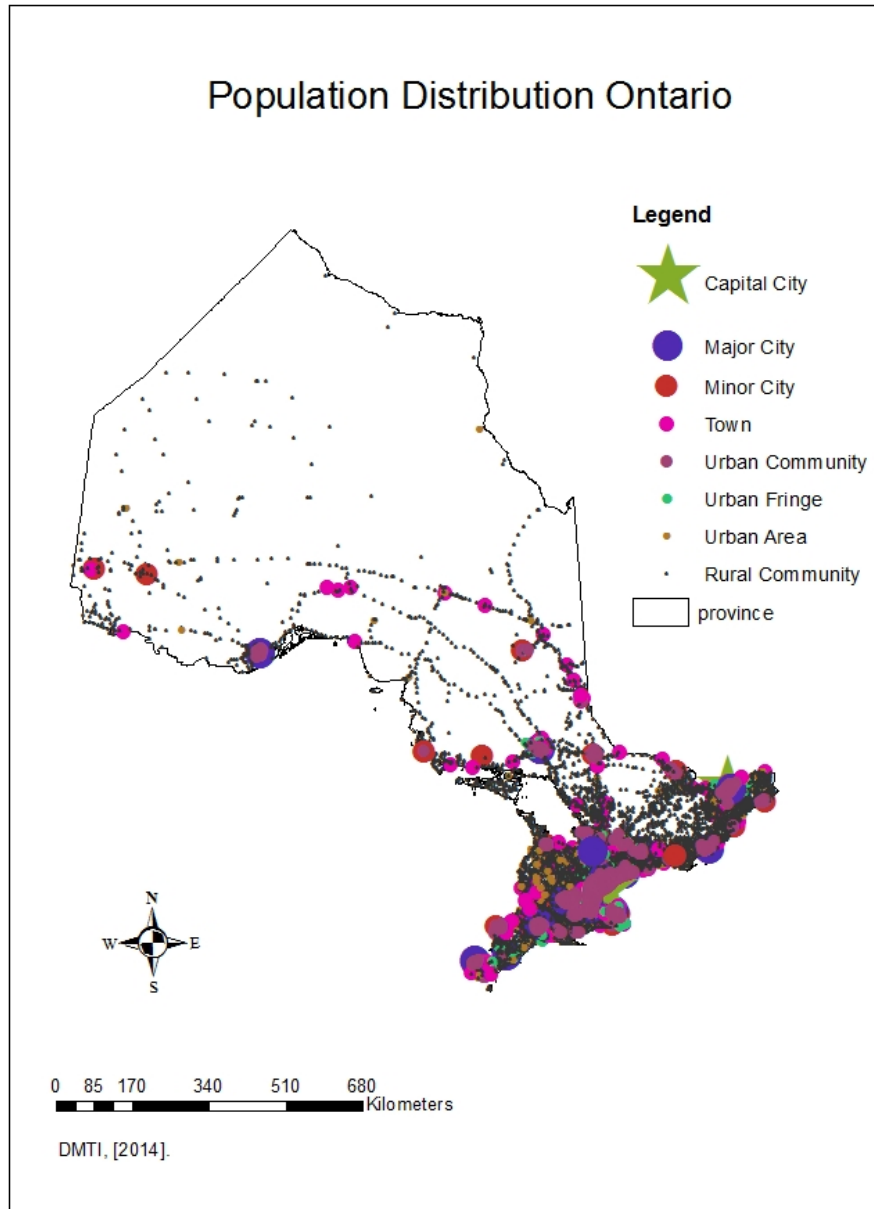


Figure 2: Population Distribution Ontario, 2011

In light of the importance of private land conservation as natural landscapes continue to be altered for human use, and the inability of governments to take sole action towards conservation goals, non-governmental agencies that focus on private land conservation are commonplace in all developed countries (Goddard, Dougill, and Benton, 2013). Non-governmental organizations exist at the grassroots to the international level (Barritt, 2014), and can have a large role to play in private land conservation through education and outreach (Mir and Dick, 2010; Olive and Minichiello, 2013), and through the provision of incentives and opportunities to participate in conservation programs (Kamal, Grodzinka-Jurczak, and Kasynska, 2015). However, conservation spending towards non-governmental organizations and other groups may be related to the economy (Pergams, Czech, Haney and Nyberg, 2004). In times of economic downturn, smaller non-governmental organizations may not be financially able to reach a wide audience, and have to rely more on voluntary conservation behaviours of private landowners.

2.2 Regulatory Approach

To increase land conservation efforts in the private sphere, governments often apply regulatory or economic tools to influence landowner behaviour. However, property rights have evolved over time and inform the attitudes of property owners. Landowners often oppose direct regulation because it interferes with their property rights (Paloniemi and Tikka, 2008), and may also interfere with their ability to use their property for economic gain (Tikka and Kauppi, 2003). Further, top down regulatory approaches often raise issues of trust in government intentions (Cooke, Langford, Gordon, and Bekessy, 2011), which

can act as a barrier to the uptake of conservation initiatives on private land (Raymond and Olive, 2008). In Ontario, an example of a direct regulation that impacts landowners is the Endangered Species Act, which is meant to protect listed species. However, such an approach can often have unintended negative consequences on biodiversity conservation. For instance, if landowners were to find a listed species on their property they might destroy it rather than report it and risk having limitations imposed on use of their property (Leuck and Michael, 2003; Innes and Frisvold, 2007).

2.3 Economic Incentives

Aside from direct regulation, economic incentives have also been widely utilized to encourage pro-environmental behaviours. In terms of private land conservation, tax incentives are often used to influence landowners to change their behaviour (Doremus, 2003; Kammin et al. 2009; Mir and Dick, 2012). In exchange for engaging in conservation behaviours on their land, eligible landowners may receive a property tax reduction on qualified lands. An example of such a program in Ontario is the Ministry of Natural Resource's tax incentive programs. Arguably, economic incentives may be more often required in working landscape contexts, where the conservation land would otherwise be used for crop production and the livelihood of the landowner (Pannell and Wilkinson, 2009; Mir and Dick, 2012). However, economic incentives for conservation may not be necessary for all landowners to engage in conservation behaviours on their land, and are often an inefficient use of government resources (Raymond and Olive, 2008).

Although economic incentives have widely been successfully applied in the environmental realm to help encourage a wide range of pro-environmental behaviours, they are based on the assumption that people behave in a purely economically rational, and utility-maximizing fashion. But models based solely on rational choice are often over-simplified and unrealistic (Turaga, Howarth, and Borsuk 2010). For instance, if people were only interested in economic gain, pro-environmental behaviours such as recycling may not be commonly observed. Further, economic incentives may “crowd out” existing pro-environmental behaviours by changing individual expectations of responsibility (Raymond and Olive, 2008; Cooke et al. 2011). Further, Sorice, Haider, Conner, and Ditton (2011) argue that relying solely on economic incentives is insufficient, given how varied individual landowners are in values and beliefs about their land. Instead, social networks and collaborative processes that help to build social norms should also be emphasized (Cooke et al. 2011).

2.4 A Social-Psychological Approach

Regulatory and economic incentive approaches have long been used to encourage pro-environmental behaviour. However, such approaches may be ineffective at changing long-term behaviours (Armsworth et al. 2012). To address this gap, much research has focused on applying social-psychological models of behaviour to pro-environmental behaviours. Since the 1970s, three main models have been a major focus of research on pro-environmental behaviours including norm activation theory (Schwartz, 1977), values-

beliefs-norms theory (Stern, Dietz, Abel, Guagnano, and Kalof, 1999), and the theory of planned behaviour (Ajzen, 1991).

2.5 Norm-Activation Theory

In the 1970s, Schwartz developed norm-activation theory to understand pro-social behaviour. Specifically, norm activation theory was used to explain altruistic behaviour, which can also include pro-environmental behaviour (Turaga et al. 2010). Norm activation has two major steps. First, an individual must be aware that their actions have consequences on others. Second, the individual must feel a personal responsibility to take action. Personal moral norms arise in specific situations, and reflect the expectations that people hold for themselves (Turaga et al. 2010). Violating personal norms results in feelings of guilt, while following personal norms results in a feeling of pride. In the 1970s, Van Liere and Dunlap (1978) posited that the norm activation theory would not only be applicable to behaviour concerning other humans, but to environmental behaviours as well. It has since been widely used to understand pro-environmental behaviours, and is generally well accepted (Turaga et al. 2010). Recently, the norm activation theory (Schwartz, 1977) has been applied in the literature towards understanding recycling and reuse behaviour (Mathies, Selge, and Klockner, 2012), energy conservation (Bator, Tabanico, Walter, et al. 2014), and forest conservation on agricultural lands (Mastrangelo, Gavin, Laterra, et al. 2014).

2.6 Values-Beliefs-Norms

A second prominent theory arising from the social psychological literature is values-beliefs-norms theory (Stern et al. 1999), which argues that in addition to altruistic values, egoistic and biospheric value orientations also influence pro-environmental behaviour (Turaga et al. 2010). Values-beliefs-norms theory builds on Schwartz's norm activation theory by arguing that norms are activated when individuals believe that threats to valued objects exist, and that their actions can help to alleviate the threat to valued objects (Stern et al. 1999). In this theory, concern for valued objects can fall into the categories of the self (egoistic), other people (altruistic), and other living beings (biospheric). The theory was originally used to explain support for environmental movements, and various types of Pro-environmental behaviour (Figure 3). More recently, it has been used to explain awareness for environmental problems (Wynveen, Kyle and Sutton, 2014), and ecological behaviours in general (Gonzalez-Lopez and Cuervo-Arango, 2014; Grenier, 2014).



Figure 3: Values-beliefs-norms theory (Stern et al. 1999)

2.7 Theory of Planned Behaviour

A third major theory from the social-psychological literature is the theory of planned

behaviour, developed by Ajzen (1991). The theory of planned behaviour is a rational decision making framework that focuses on behavioural intention as an antecedent to actual behaviour. Similar to Schwartz (1977) and Stern (1999; 2000), Azjen's theory included norms. However, the theory of planned behaviour also takes into account attitudes toward the behaviour, and perceived behavioural control to predict behavioural intent. Ajzen (1991) recognized the complexities of explaining behaviour, and argued that behaviour depends largely on non-motivational factors such as availability of opportunity and resources (Ajzen, 1991). Also included within the theory of planned behaviour is perceived behavioural control, which represents the perceived or actual barriers to performing an action. Perceived behavioural control represents the ease of engaging in a specific action (Figure 4). Recent studies have focused on trying to incorporate moral norm theories like values-beliefs-norms and norm-activation scheme into rational choice models such as the theory of planned behaviour (e.g. Price and Leviston 2014). However, there seems to be disagreement on how various aspects might fit together to explain pro-environmental behaviour. For instance, while del Carmen Aguilar-Luzon et al. (2012) found evidence that recycling behaviour as a type of pro-environmental behaviour is better explained using the theory of planned behaviour (Ajzen, 1991) rather than values-beliefs-norms theory (Stern et al. 1999), Price and Leviston (2014) found support for combining various aspects of both theories to explain environmental land management practices by Australian farmers. Further, Price and Leviston (2014) argued that there is currently a lack of existing frameworks that apply general theories of pro-environmental behaviour to land management as a specific type of pro-environmental behaviour, illuminating the need for further research on the topic.

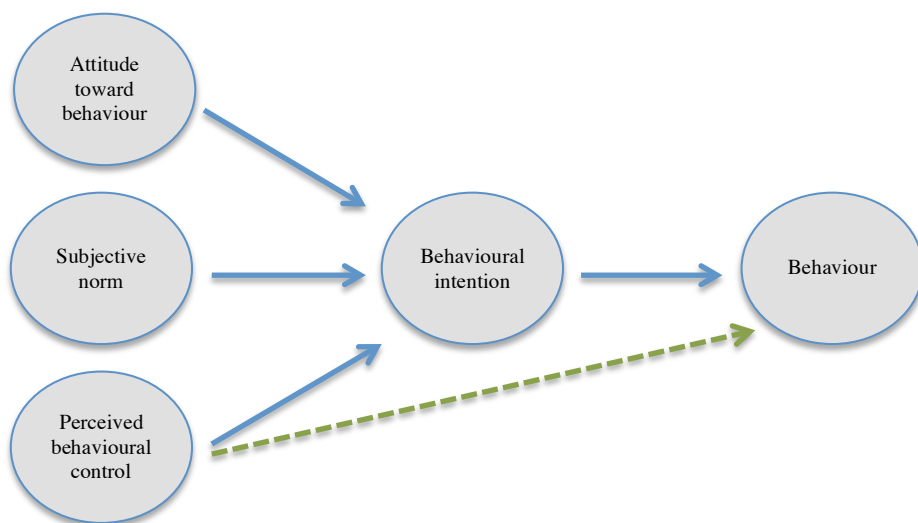


Figure 4:
Theory of
planned
behaviour
(Ajzen, 1991)

2.8 Connectedness-to-Nature

Traditional social-psychological models leave much variation in pro-environmental behaviour unexplained. Therefore, research has begun to focus on connectedness-to-nature theory to understand pro-environmental behaviours (Schultz et al. 2003; Mayer and Frantz, 2004; Nisbet and Zelenski, 2009). The human-nature relationship as a focus of study is not new. For instance, the ecologist Leopold (1949) called for a fundamental shift in how humans view their relationship when he famously stated:

“We abuse land because we see 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.”

Leopold called for humans to see themselves as part of nature, which is ultimately at the core of connectedness-to-nature theory. It has since evolved into numerous different scales

that attempt to measure connectedness, and constructs similar to connectedness, which raises challenges to gaining a comprehensive understanding (Restall and Conrad, 2015). For instance, it has been referred to in the literature as emotional affinity toward nature (Kals, Schumacher, and Montada, 1999), inclusion of nature in the self (Schultz, 2001), nature connectedness (Schultz, 2002), connectivity with nature (Dutcher, Finley, Luloff, and Johnson, 2007), nature relatedness (Nisbet, Zelenski, and Murphy, 2009), and love and care for nature (Perkins, 2010). Indeed, validity scores between the scales might indicate that they are closely related to the core construct of connectedness-to-nature (Brügger 2011). Although much research has focused on developing measurement tools and testing their validity and reliability, much less has focused on the role that such constructs play.

In academia, connectedness-to-nature can be traced back to at least 1999, when Kals et al. argued that pro-environmental behaviours could not be sufficiently explained by purely rational/cognitive approaches such as the theory of planned behaviour (Ajzen, 1991). Therefore, their research focused on understanding emotional motivations and resulted in the development of the emotional affinity towards nature scale, which attempted to measure both love for, and a feeling of oneness with nature. Results indicated that emotional affinity is a predictor of willingness to engage nature protective behaviour. Although Kals et al. (1999) used the term affinity towards nature, Schultz et al. (2003) furthered the concept by coining the term “connectedness-with-nature”, which is intended to be an implicit measure of the extent to which an individual believes he/she is a part of nature. Schultz et al. (2003) argued that the type of concerns that a person develops is associated with the degree to which they feel they are a part of nature.

There is general agreement that connectedness-to-nature is associated with pro-environmental concern, values, and beliefs, and certain types of pro-environmental behaviours. For instance, Kals et al. (1999) found affinity, interest, and inclination towards nature to be predictive of nature-protective behaviour. Similarly, Allen and Ferrand (1999) found that sympathy towards nature was predictive of environmentally friendly behaviour. Further, numerous studies (Schultz, 2001; Clayton, 2003; Mayer and Frantz, 2004; Nisbet et al. 2009) have found connectedness-to-nature to be related to self-reported pro-environmental behaviour.

Although the studies mentioned have found similar results, it should be cautioned against applying the results to all pro-environmental behaviours (Gosling and Williams, 2010). Pro-environmental behaviours can be separated into various types such as citizenship, consumer behaviours and ecological management behaviours (Stern et al. 1999). Collado, (2013) suggests that differentiating between types of behaviour is important, as the expression of more effortful behaviours may require a higher level of connectedness-to-nature, as well as other motivations. Similarly, Ernst and Theimer (2011) note that while there is considerable research available regarding the association between connectedness-to-nature and pro-environmental behaviours, the nature and strength of such a relationship needs further study, especially when differentiating between various types of pro-environmental behaviours.

Existing research often focuses on pro-environmental behaviours that may be easier to

engage in such as support for environmental causes, or picking up litter. In comparison, land conservation behaviours may be more difficult to engage in, and may be heavily influenced by contextual factors such as money, time, and equipment. Currently, a gap exists between feelings and attitudes (connectedness) towards nature and action. The field needs to address this gap to attempt to turn concern into behaviour (Nisbet et al. 2009).

Recent literature that has attempted to address this gap by focusing specifically on the role that connectedness-to-nature might play in land conservation, and has found mixed results. For instance, Raymond et al. (2011) found that connectedness-to-nature was a significant predictor of personally held norms related to conservation, but it did not predict behaviour itself. In contrast, Gosling and Williams (2010) found that connectedness-to-nature did in fact predict conservation behaviour by Australian farmers. Further illustrating the need for clarification of the role of connectedness-to-nature is the fact that the aforementioned study involved working landscapes, which may be viewed as different from non-working landscapes from a conservation standpoint. Therefore, more research is needed to determine the role that connectedness-to-nature may play in the expression of land conservation behaviours in non-farming, private landscapes.

2.9 Developing Connectedness-to-Nature

Little research has focused specifically on understanding factors that lead to the development of connectedness-to-nature. Indeed, upon creation of the connectedness-to-nature scale, Mayer and Frantz (2004) called for future research to fill this gap. Although

research to date has not necessarily focused on understanding the development of connectedness-to-nature as a specific construct, related research has focused on understanding the development of environmental knowledge, skills, values, and concerns, and factors leading to career choice (Tanner, 1980; James, Bixler, and Vadala, 2007). Such research may offer insights into factors that might also lead in the development of connectedness-to-nature.

Utilizing a significant life experience approach by asking conservationists for an autobiographical account of what factors they thought led to their career choice, Tanner (1980) found exposure to natural areas, habitat contact, and older family members to be the top three responses. Similar results were found by Chawla (1999), Palmer (1993), Sivek (2002), and Sward (1999). Additionally, Farmer, Chancellor, and Fischer (2011) found that informal experiences in and about the outdoors had an important impact on the development of a conservation ethic. These studies offer insights into potential ‘key factors’ that might also be useful when applied to the development of connectedness-to-nature, though current gaps exist. For instance, in a study focused on environmental education programs, Ernst and Theimer (2012) claimed there is a lack of understanding about what types of specific nature experiences help develop connectedness-to-nature. Scholars in the field of nature socialization research argue that although formal education experiences are important, serendipitous experiences should not be discounted (James, Bixler, and Vadala, 2010), most research has focused on understanding the role that formal environmental education programs play in connectedness and less so on non-formal outdoor childhood experiences such as hiking, fishing, and hunting. Ernst and Theimer

(2011) discuss that more research is needed to understand the influence of childhood experiences on connectedness-to-nature.

Recent research has now begun to focus on understanding what factors might lead to the development of connectedness-to-nature, and has pointed to various factors that may lead to development of connectedness-to-nature including childhood experiences in an outdoor setting and positive mentorship during childhood (Palmer 1993; Sward 1999; Chawla 1999; Sivek 2002; Chawla 2007; Ernst and Theimer, 2011). Research has also examined the role of formal education programs with mixed results (Ernst and Theimer, 2011; Collado, 2013). For instance, it has been difficult to determine whether connectedness-to-nature is influenced by formal education or by outdoor experiences in general. Collado (2013) attempted to address this knowledge gap by isolating formal environmental education from unstructured experiences by using two groups of students at a summer camp and found that the group without formal environmental education programming showed the same affinity towards nature as the group who received formal environmental education. Therefore, Collado (2013) argues that perhaps unstructured time in nature is enough for children to develop an affinity towards nature, a measure similar to connectedness. However, more research must be done to understand what types of experiences may lead to a development of connectedness-to-nature, and if people who lack connectedness-to-nature really failed to have similar childhood experiences.

2.10 Key Gaps

1. While much research has focused on the development and testing of tools to measure concepts related to connectedness-to-nature (Kals et al. 1999; Schultz, 2003; Mayer and Frantz, 2004; Nisbet et al. 2009), there is a lack of research focused on the role that connectedness-to-nature plays in specific pro-environmental behaviours. Recent research has found mixed results regarding the effect of connectedness-to-nature on private land conservation activity as a specific type of pro-environmental behaviour.

2. Existing research has found exposure to nature and learning from adults to be key factors in developing environmental attitudes, concerns, skills, and careers. However, less research has focused on understanding factors that lead to the development of connectedness specifically.

3.0 Methods and Materials

This chapter outlines the approach and rationale utilized in this study to understand conservation behaviour in Ontario landowners, the development of connectedness-to-nature in Ontario landowners, and the role that connectedness-to-nature plays in private land conservation.

3.1 Methodological Approach

To further our understanding of the complexities of private land conservation behaviour, a qualitative inductive approach was applied (Patton, 1990). A flexible approach allowed participants to express personally held attitudes, perspectives, and narratives related to land conservation in their own words. It is hoped that this study can shed light on conservation attitudes and behaviour of Ontario landowners that will advance knowledge in this field of research, and can be applied to improving policy and programs for private land conservation.

3.2 Social Constructivism

A social constructivist view was applied to this study. Social constructivism emphasizes the relationship between researcher and participants. Researchers are an inherent part of the research process and inevitably influence the research outcomes (Mils, Bonner, and Francis, 2006). In an attempt to minimize this effect, from the outset the researcher refrains from applying pre-conceived ideas to prove or disprove. Throughout the course of the

research, issues of importance emerge through the narrative that researcher and participants co-create. It is through this interaction that meaning, understanding, and theory is generated using a constructivist grounded theory approach.

3.3 Constructivist Grounded Theory

My personal beliefs about the nature of knowledge generation through co-creation of meaning is reflected in the choice of a constructivist grounded theory approach. Originally, developed by Glaser and Strauss in 1967 as a systematic approach to qualitative research (Bryant and Charmaz, 2007), it has since evolved into various formats. While traditional grounded theorists argue that a real, objective reality emerges through the research process (Glaser, 1978), constructivist grounded theory is based on the notion that a discovered reality is co-created between researcher and participant (Charmaz, 2000). The form of grounded theory methodology applied depends on the beliefs about the nature of the relationship between the researcher and participants (Mils et al, 2006). The format of grounded theory followed in this study is largely based upon Charmaz' constructivist grounded theory due to the alignment of constructivism with the my personally held view of the nature of learning and knowledge generation.

3.4 Study Location and Characteristics

The study was situated in south and central Ontario, Canada, the most densely populated region in Canada. As of 2011, this geographic area was home to approximately 12 million people (Statistics Canada, 2011), placing substantial development pressure on the natural

land cover in the region. Due to the vast majority of land in the area being privately held (Figure 1), southern and central Ontario is of special interest for private land conservation. The extreme south of the province is also home to the Carolinian life-zone, which is less than one percent of Canada's land mass but home to 25% of Canada's species at risk (Carolinian Canada, 2015). It is hoped that understanding more about land conservation behaviour can help to increase the quality and quantity of natural heritage provided in this densely populated, and ecologically significant region of Ontario.

3.5 Phase 1: Survey

This research was part of a much larger multi-phase, mixed-methods study. Although the second, qualitative phase of the study is much more relevant to this particular study, the quantitative, first phase of the study (i.e., survey) is outlined because of its implications for interviewee identification for the qualitative phase of the study. Further, the connectedness-to-nature scores (Mayer and Frantz, 2004) collected in the first phase of the study were also utilized in this particular qualitative research project.

The large-scale mail questionnaire was sent to 1,200 landowners beginning in May 2014. Landowners were identified by the Ontario Ministry of Natural Resources and Forestry (OMNRF) to have tenure of land that is eligible for one of two tax incentive programs: The conservation lands tax incentive program (CLTIP) offers a tax break for land with a variety of natural features of significance, while the managed forest tax incentive program (MFTIP) offers a tax break for woodlots over 4.05 ha (10 acres) specifically. This

population was chosen because participation in the programs can be seen as an example of land conservation behaviour. Further, these properties are known to be relatively large parcels of land with important natural features, perhaps providing opportunity for a wide range of land conservation activities, which is the subject of this research.

The survey was designed to follow Dillman's Tailored Design Method (TDM) to maximize social exchange between researchers and potential participants using both mail and Internet (Dillman, 2007). Research into survey methods has shown that the TDM can help to attain response rates of up to 70% (Huang, Hubbard, and Mulvey, 2003). Scholars have also found that providing incentives to participants can also help greatly increase the response rate (Warriner, 1996). Consequently, a five-dollar cash incentive was provided to each participant. Utilizing the TDM approach coupled with cash incentives helped lead to a fairly high response rate of 55%.

Maintaining numerous contact points and maximizing social exchange with potential survey respondents can garner higher response rates (Dillman, 2007). This principle was utilized by maintaining up to six contact points with potential participants. Prior to sending the survey, an advance letter was mailed to potential participants to explain the project. Second, a survey package was sent out with an information letter, the survey itself, a five-dollar bill, a return envelope with postage, and a 'frequently asked questions' page. The information letter also stated how participants could access the survey online if they preferred to do so. Two weeks later, all non-respondents received a brief reminder postcard. One week after the postcard was sent, non-respondents received a follow up letter, a second

copy of the survey, and return envelope with postage. The follow-up letter was intended to be a reminder and to indicate the importance of participation. Roughly two weeks later, all remaining non-respondents received a second follow up letter, survey, and return envelope with postage. It was believed that any non-respondents after the second follow up letter were highly unlikely to respond. The phase concluded with a thank-you letter to all respondents. A common critique of Dillman's method is that repeated contacts may prove to be an annoyance for uninterested potential participants. Therefore, all materials included contact information, which enabled participants to express their desire to decline participation in the study.

The questionnaire was 21 pages long, comprised of six sections. Section one focused on participation in the OMNRF conservation programs, section two focused on land conservation attitudes and behaviour, section three focused on views about the OMNRF conservation programs, section four asked about a broad range of opinions on environmental matters, section five focused on participant background information, and finally, section six focused on environmental choices and decisions. Questions were formatted as multiple choice, Likert scale, and open-ended responses.

The first phase of the study began in early May 2014, with survey responses continuing to be returned until November 2014. Although this particular research focuses more on the second phase of the study, the first phase provided valuable information and opportunity for the second phase of the study. Participants to the first phase of the study were able to indicate whether they would be interested in participating in the second phase of the study,

consisting of interviews. Overall, 207 (31%) of respondents from the first stage indicated interest in participating in the qualitative interviews.

3.6 Phase 2: Interviews

The interview phase began in February 2015 and ended in June 2015. Participants from phase one who indicated interest in participating in interviews were contacted with an information letter. One week after the letter was sent, the participants were contacted by phone to set up a time and location. Twenty-three interviews were completed, of which, twenty occurred in the participant's home, two were taken in coffee shops, and one was taken over the phone. Interviews followed a semi-structured format, and lasted between 30 minutes to one hour and 30 minutes, with an average duration of 50 minutes. With the consent of each participant, interviews were recorded using a digital microphone. The interview files were then uploaded to a personal computer and transcribed verbatim.

3.7 Ethics

This study received full ethics clearance from the University of Waterloo Office of Research Ethics (#19326). All materials used in this study including information letters, the survey itself, and interview questions were submitted, reviewed, and approved by the office of research ethics. The study received annual review clearance in September of 2015, providing ethics clearance for a further 12 months.

3.8 Interviewee Selection

Participants' scores on the connectedness-to-nature scale were known based on data collected during the first, quantitative phase of the study. Participants who scored high, medium, and low on the connectedness-to-nature scale (Appendix A) were purposively selected in order to compare and contrast for similarities or differences between groups. It was hoped that comparison would illuminate experiences (or lack thereof) that ultimately influence the development of connectedness-to-nature. Further, the aim of comparing the groups was also to help to determine if there was a difference in the land conservation activities between participants who scored high on connectedness-to-nature, and those who scored low. Due to project resources, potential interviewees were also grouped into geographic location to reduce travel costs (Table 1). While some of the participants in the study included currently-active farmers, the interviews always focused on non-farming land portions. Seventeen males and 6 females were interviewed; the median age was 63 years, well above the national median age of 39.9 years. Of the participants, 73.9% had an education level of at least college or university undergraduate degree, compared to the provincial average of 56% (Statistics Canada, 2009). The sample's median household income was between \$100,000 and \$119,000 per year, while the average for the province as a whole is \$76,510 (Statistics Canada, 2013). Overall, demographics indicate that the study sample was older, more educated, and wealthier than the general provincial population.

The theoretical minimum score on the connectedness-to-nature scale is 14, while the theoretical maximum is 70. Participant scores in this study ranged from a minimum of 20 to a maximum of 47. For the purposes of this study, participants were sorted into groups of high, medium, and low scores from the connectedness-to-nature scale. High scoring was defined as over 45, medium scoring was defined as 35-40, and low scoring was defined as less than 30.

PARTICIPANT	AGE	SEX	LOCATION	OMNRF PROGRAM	CONNECTEDNESS-TO-NATURE SCORE	CATEGORY
1	50	Male	Barrie	CLTIP	47	High Scoring
2	53	Female	Mount Forest	CLTIP	47	
3	53	Male	Puslinch	CLTIP	47	
4	53	Male	Uxbridge	CLTIP	46	
5	54	Male	Mount Albert	MFTIP	46	
6	55	Male	Cambridge	CLTIP	46	
7	56	Female	Woodstock	CLTIP	46	
8	57	Male	Burnstown	MFTIP	45	
9	59	Male	Guelph	CLTIP	38	Medium Scoring
10	59	Male	St Paul's	CLTIP	36	
11	62	Male	Cambridge	CLTIP	35	
12	63	Female	Puslinch	CLTIP	35	
13	66	Male	Cambridge	CLTIP	34	
14	66	Female	Milton	N/A	30	Low Scoring
15	67	Male	Kingston	MFTIP	29	
16	70	Female	Ottawa	MFTIP	29	
17	72	Male	Yarker	MFTIP	28	
18	72	Male	Kingston	MFTIP	28	
19	77	Male	Cambridge	CLTIP	27	
20	77	Female	Sutton	MFTIP	25	
21	81	Male	King City	MFTIP	22	
22	84	Male	Owen Sound	CLTIP	22	
23	85	Male	Guelph	CLTIP	20	

Figure 5: Participant information

*eligible but not participating in OMNRF programs

3.9 Interview Structure

Interviews were semi-structured and were meant to be open to achieve an understanding that was grounded in the personal reality of each participant. For context, the interviews began with questions about the land, including participants' personal history and interaction with the land. Interviews then proceeded to focus on land management activities, which allowed landowners to think about how they interact with flora, fauna, and the land itself. Significant life experiences and relationships were also explored. During the interview, all landowners were encouraged to speak freely, and prompted to expand on topics of interest to the study. The interview was tested in a practice interview setting prior to data collection. Questions were adjusted based on feedback from the practice interviews (Appendix B).

3.10 Grounded Theory Analysis

Constructivist grounded theory places the researcher as “the author of a reconstruction of experience and meaning” (Mils et al. 2006). Experience and meaning were reconstructed using a process common to constructivist grounded theory, including data collection, open coding, memo writing, focused coding, sorting, and limited theory development. Coding is the process of labeling data and was the first step in analysis. Memos were written notes about what I saw emerging in the data. Sorting involved discerning which memos, codes, and categories are pertinent to theory development. During the entire research process, I stayed close to the data, constantly comparing codes to categories, codes to codes, and codes to data to ensure an analysis that is truly “grounded” in the data (Charmaz, 2014). Although in-depth interviews are the main form of data collection in the majority of

grounded theory studies, grounded theory also utilizes other forms of data, including observation and survey data. This study also made use of survey data to support the emerging analysis generated from the interview data.

3.11 Coding

Transcripts were printed to hardcopy to engage in line-by-line, open coding. The purpose of open coding was to code as freely and quickly as possible while holding no preconceptions of the data (Charmaz, 2014). Overall, 437 codes were created and stored in a database. Initial codes were not all unique or mutually exclusive. Due to the large number of codes, there were many similarities between codes. Such similarities were addressed during focused coding, a process where codes were grouped together and given a common code. All codes were stored in a database that included code properties, and examples of participant text passages. Codes were updated to fit with emerging analysis as an ongoing process.

3.12 Memos

Memo writing is the process of writing down ideas about what is occurring in the emerging analysis, and is the first step towards final results. Memos are meant to be free in nature to allow the researcher to express informal ideas about the research, and push the research forward. Memos were often written immediately following each interview when memory was most accurate, and were updated as analysis progressed. A methodological journal was

also created and updated to keep track of important steps and rationale throughout the research process.

3.13 Constant Comparison

One of the key aspects of grounded theory is the use of the constant comparative method (Mills et al. 2006; Charmaz, 2014). Initially, memos were compared against each other to identify emerging similarities and differences on a broad scale. After each interview was transcribed, participants' statements to specific questions were compared to each other on a finer scale. Initial codes were also constantly compared, which resulted in the collapsing of similar open codes into themes and categories. Themes were then developed as interviews progressed. The constant comparison of cases, memos, data, codes, and themes allowed for exploration and development of emerging analysis, which ultimately led to the major themes presented in this research.

3.14 Sorting

Codes were first sorted manually in a codebook. Initial codes were then grouped into focused codes, which eventually became the major themes and focus of analysis. Diagrams were also extensively used to understand emerging relationships between various themes. Diagrams, memos, and ideas were recorded so that they could be compared as analysis evolved. Updated memos were written during the process of diagramming codes and themes. Memos, codes, and themes were sorted to flow in a clear, logical manner.

3.15 Limited Theory Development

To limit preconceptions on the data, the literature was explored after analysis began to explore models that fit the data well. Themes and ideas from existing social-psychological and pro-environmental behaviour research were applied to this study. An exploratory, theoretical model that is grounded in the data is presented in chapter 5 of this thesis.

3.16 Ensuring Quality in Qualitative Research

Ensuring rigor and high quality of research began with the decision to follow a theoretical sampling technique, a common approach in grounded theory (Charmaz, 2014). While quantitative studies aim for a statistically representative sample, this research attempted to gain a better understanding of the studied phenomena. Therefore, the sample included participants who expressed the phenomenon of interest (connectedness-to-nature), as well as the negative cases (Yardley, 2007). Predefined codes were not applied due to their potential to limit creativity and emergent themes. However, sensitivity to context was achieved by engaging with the literature on an early and ongoing basis. An effort was made to integrate the findings to add to the existing literature in the field. Transparency was achieved by detailing the methods used for the data collection and analysis process, and was based on the widely used resource by Charmaz (2014). Finally, the amount and depth of data collected added rigor to the study. The steps outlined in this methods chapter ensured that this qualitative research was of high quality by taking steps to assure

sensitivity, rigor, transparency, and importance by contributing to the conversation in the existing literature (Yardley, 2007).

3.17 Summary

This chapter began by explaining the qualitative approach chosen for this study, which was based on my social constructivist views and ultimately led to the use of social constructivist grounded theory. Data collection was also presented, including the application of the survey tool, followed by the interview participant selection and interview structure. The chapter concluded with a presentation of how constructivist grounded theory methodology was used to analyze the data. The following chapter focuses on results and analysis.

4.0 Results and Analysis

The analysis revealed three major, interrelated categories grounded in the 259 pages of single-spaced interview transcripts. This section will discuss each category in detail as it relates to the objectives of the study, including the use of quotes to illustrate the findings.

The three major categories that will be presented and discussed in this chapter are as follows:

1. Developing connectedness-to-nature.
2. The role of connectedness-to-nature in the expression of conservation attitudes and conservation behaviour.
3. The rural landownership decision and experience.

4.1 Developing Connectedness-to-Nature

Of the 23 participants in this study, eight scored high on the connectedness-to-nature scale, five scored mid-range, and ten scored low (Figure 5). The purpose of interviewing landowners with a wide range of scores on the connectedness-to-nature scale was to try to understand (1) how connectedness develops, and (2) what the differences are in land conservation behaviour between those who are developing high connectedness-to-nature, and those who are not. Two main patterns for developing connectedness-to-nature emerged amongst participants in this study. They are exposure to and experiences in nature, and having a mentor.

4.1.1 Exposure to and Experiences in Nature

How youth spend their time may influence what kinds of beliefs they develop later in life, including how they view nature. The majority of participants in this study recalled much of their free time during childhood being unstructured, regardless of score on the connectedness-to-nature scale.

“When I was a kid, I could leave the house when the sun was up. I had to be back in the house when the sun went down.” [P20]

“My life was pretty much just ranging around the countryside as a kid.” [P22]

Unstructured time may be a characteristic of many childhoods in decades past. However, differences emerged between groups in the recollection of unstructured time spent outdoors. For those who scored high on the connectedness-to-nature scale, much of their free time was unstructured, and spent exploring nature around them. Exploring the natural world was remembered as being the happiest times of their lives.

“Probably because the happiest times as a kid were outside running around, being outside.” [P7]

“I used to view it [nature] as my playmate. It was my companion. It was a source of my recreation; it was a source of my income; it was a source of my learning” [P4]

“We were always outside. We always loved nature a lot.” [P1]

“I like lived in the forest! You weren't afraid. I'd go out at eight o clock in the morning and come back when it got dark.” [P2]

Further, landowners who scored higher on the connectedness-to-nature scale often recalled interacting with non-human beings such as frogs, fish, and hunting quarry. Engaging with

animals helped them to develop a relationship with other beings.

“You'd go like...If there was a polywog to be found or a frog to be found, you were always just playing around in stuff like that” [P7]

“The farm was alongside a small lake, which obviously gave a young boy a tremendous amount of time to fish, and hunt, and trap, and tramp through the marshes and the shorelines, and probably, without knowing, understand how the hip bone is connected to the knee bone; that the woodlots and the farm, and the open fields, and the marshes all have a symbiotic relationship to each other. I probably got grounded in my appreciation for the outdoors more so from that than any other source... The lands, the streams, the woods, the forest. I was a squirrel hunter and a pheasant hunter; a duck hunter and a fisherman. I trapped when I grew up in this little town.” [P4]

“We had a cottage, or still do have this cottage on lake Simcoe. And, you know, as a young kid we were playing in the muck; in the mucky water catching the frogs... I just sort of grew up with all of that. The simple life, right?” [P1]

In contrast, participants who scored lower on the connectedness-to-nature scale did not seem to recall similar experiences of interacting with other non-human beings. This discrepancy in experiences between groups suggests that positive experiences interacting with non-human beings may be important to the development of connectedness-to-nature.

Just as important as unstructured time to explore, were the places where such time was spent. Many participants recall fond memories finding nature in specific places, such as a family homestead, cottage, or other retreat.

“I just think it was the environment I was put in. When we went to the cottage, we were really attached to nature there. We had this creek, then over further there was this abandoned beach area that had high grass...As kids we would go over there and explore.” [P1]

“I spent a lot of days when I was younger at the farm. I just had a love for the farm... I just spent a lot of time there as a kid. There was a creek running through,

woods. Yeah, it was a great spot...It was my favourite place in the whole world.” [P7]

Not everyone had access to a specific place such as a cottage or family homestead to explore nature. Therefore, being able to access nature anywhere was also found to be important for helping to develop a feeling of connectedness-with-nature. For many, unstructured time was spent outdoors in a variety of places.

“I liked the fact that you could go from the city out to an area that was open and you could walk along the river.” [P6]

“I think it just comes from when I was a kid. Even if you lived in urban areas, you always had a lot of green spaces around. A lot of forest area.” [P2]

Not all participants grew up in a rural setting with access to an abundance of natural areas.

However, nature was still accessible in urban areas, as one participant stated:

“Where I was born was sort of on the outskirts of a town. Still in town, but on the outskirts with a big garden and a big forest a couple of blocks away.” [P19]

Results indicate that unstructured, positive experiences in nature, along with interacting with non-human beings may help in the development of connectedness-to-nature.

Exposure to nature, and experiencing unstructured time to explore helped to develop a life long connection to nature, as one participant stated:

“I think the vistas and the vision that you give young people are the ones they carry on with them when they're older. So if you're used to natural beauty as a child, you probably will either return to it, or do everything possible to nurture it and keep it around.” [P3]

Participants who scored lower on the connectedness-to-nature scale also recalled spending much of their time outdoors. However, they did not recollect memories with similar fondness as participants who scored higher on the connectedness-to-nature scale. For instance, when prompted to discuss their memories of childhood activities, low scoring participants more often recalled outdoor experiences as mundane, and neglected to associate strong emotion with their memories in the same way that high-scoring landowners did.

“I guess I enjoyed walking more then. I had to do it, so that was one thing. Often on a Sunday afternoon I would go out and walk through the back.” [P15]

“I think it was always a part of me in a sense that it was nothing foreign or scary. It was there, and it was there for me to investigate.” [P19]

“As a kid, you play hockey outside; you play baseball in the backyard, you go to the park.” [P23].

When prompted to discuss their childhood experiences interacting with nature, low scoring participants did not attach strong, positive emotions with nature experiences to the extent that participants who scored higher on the connectedness-to-nature scale did. This result suggests that the specific type of experiences in nature and the affective impact they had on the individual is important to developing connectedness.

4.1.2 Having a Mentor

Unstructured, positive experiences spent in natural settings offer insight into the “what” and “where” of developing connectedness-to-nature. However, mentors are the “with whom” and also play a pivotal role in fostering a feeling of connectedness-to-nature. Mentors were not there to force nature upon participants, but exposed them to natural settings, sparking an interest. Participants who scored high on the connectedness-to-nature scale often readily recalled experiences with people in a mentorship role, including family friends, parents, and grandparents. These participants spoke fondly of positive memories with their cherished mentors who not only exposed them to natural settings, but also furthered their appreciation and knowledge of the natural world. By providing exposure, mentors helped to spark the initial interest in nature that ultimately lead to a life-long connection to nature.

“I had a good friend of mine... as I say a good friend of mine but he was my father's age; probably a bit older than my dad. But he had a property up on Mt. St. Patrick. I loved that property... This friend of my father, I guess was the closest. We did a lot of things together... I tagged along with this guy... He would have been as close as I got to someone I looked up to and admired. I liked his lifestyle.” [P8]

“I think his life in Finland, where forestry was very important, governed the way he treated the land. It sort of set up the ideas in everybody's head who has lived here.” [P5]

“I was very close to my grandfather. We would go for a lot of walks and stuff. I guess that made me feel how important nature was.” [P7]

“The initial offering of my grandmother's preoccupation of living on the farm and, naturally, teaching me all that she thought was important, and my father's encouragement, and you know, buying me those green rubber boots for my birthday.” [P4]

Mentors also were there to teach, fuelling a desire to learn more about the natural world.

“I grew up spending a lot of time with my paternal grandmother who still lived on the farm that my father was raised on... So I spent my really formative years, and I look back on it as personality setting and solidifying, and my appreciation of the outdoors really grew out of my grandmother's teaching and tutorial interest in me; teaching me of nature's bounty.” [P4]

Aside from exposure to nature and teaching about the natural world, mentors also had a positive influence by setting a good example through their pro-environmental actions in general. Many participants recall witnessing mentors engaging in various types of pro-environmental behaviour, and have since applied similar behaviours in their own lives.

“I think my dad saw himself as a good steward. He talked about it a lot and now I am doing the maintenance on the farms. It's quite obvious that uh, it is essential.” [P3]

“He grew up in Finland, where conservation is very important. He was not happy with what he found here” [P5]

“I would go for walks with my grandfather through the farm, with my mom too... I think my mom and dad were before their time when it came to composting and doing the water barrel.” [P7]

Many landowners who scored higher on the connectedness-to-nature scale had similar mentorship experiences. Interestingly, landowners who scored lower on the connectedness-to-nature scale tended to speak differently about mentors or seemed to lack mentors altogether. Often, lower-scoring participants did not readily recall a specific person who influenced them, or even explicitly acknowledged the lack of people in a mentorship role in their lives.

“I wouldn't call him a mentor by any stretch of the imagination. I'm not sure about mentors.” [P22]

“There were no... there was no woodlore or anything like that. Nothing that ever reached the level of a mentor, I don't think.” [P15]

“Mentors? No. I read lots of books when I was a kid about it. That's where I picked it up” [P17]

To summarize this section of the results: Connectedness-to-nature may be developed through exposure to natural settings, positive, unstructured experiences in these natural settings, and guidance from mentors. Mentors were often family members such as parents and grandparents, and sparked interest in nature by providing opportunity to interact with nature and further the personal development of participants.

4.2 Discussion: Developing Connectedness-to-Nature

Unstructured time spent outdoors is a recollection that almost all participants had in common, and it may be reflective of times gone by. Many of the participants were over 50 years of age, with childhood years occurring prior to advances in personal-use technology, the commonality of single parent and two-working parent households, as well as the extreme onset of youth sport leagues (Louv, 2005). However, participants who scored higher on the connectedness-to-nature scale often recalled the times spent outside as positive memories; they were much more engaged and fondly reminiscent of their experiences with nature during childhood, compared to those who scored low on the connectedness-to-nature scale. Further, participants who possess higher connectedness-to-nature often spoke of memories that provoked strong positive emotions, reflective of a deep relationship with the natural world. Therefore, findings suggest positive, unstructured time

in nature may contribute to the development of connectedness-to-nature.

This finding supports previous studies in this field of research. For instance, Farmer et al. (2011) found that free play in an outdoor setting may be associated with the expression of pro-environmental behaviour later in life. Wells and Lekies (2006) concluded similarly that informal experiences in nature as a child lead to the development of environmental attitudes later in life. Bixler et al. (2010) stressed the importance of environmental socialization, which embraces the roles of formal environmental education, but also emphasizes the importance of informal and serendipitous experience in developing environmental interest (James, et al. 2010). Indeed, this study also found environmental socialization to be important in developing connectedness-to-nature, especially socialization with non-human living beings. For example, landowners who scored higher on the connectedness-to-nature scale more often recalled interacting with animals such as frogs, fish, or wild game. It appears that activities that involve interacting with other living beings may help to provide a stronger connectedness-to-nature than simply being in nature. This finding supports similar existing research by Theimer and Ernst (2012), who posited that interaction with wildlife may lead to increased wildlife sensitivity, and connectedness-to-nature.

The specific locations that unstructured play occurred in may also play a role in connectedness-to-nature. “Finding” nature wasn’t always easy, especially for participants who grew up in urban areas (Chawla, 2003). Developing a feeling of connectedness-to-nature is difficult when nature is not accessible. Participants revealed that nature was not necessarily a specific location, but often made up of different locations, such as parks,

ravines, rivers, or a relative's yard. Bixler (2010) found similar results, stating that participants did not discuss exotic or "special locations", but mostly mundane areas such as "the park across the road", "the ravine", or "grandma's farm". Therefore, natural areas must be accessible to a wider range of people, rural and urban dwellers alike, especially in southern Ontario where the majority of the population lives in urban areas (Sanderson and Huron, 2011). Well-planned and well-placed natural areas located within the urban setting have the potential to give a much larger population access to nature, providing opportunities that might not otherwise exist.

The type of unstructured time spent in nature, regardless of where that nature was located, offers insights into what experiences might help develop a feeling of connectedness-to-nature. Who such experiences were shared with also emerged as an important factor towards developing a feeling of connectedness-to-nature. Mentors were found to be important in the development of a strong relationship with nature by providing exposure as well by providing guidance for further development. This result supports findings from other research focusing on the importance of mentors for fostering pro-environmental behaviours and environmental vocation (Tanner, 1980; Chawla, 1999; Farmer et al. 2011).

Mentors were also important through providing opportunities for such experiences. In this way, mentors guided experience, but did not necessarily always take an educational role. Similarly, Chawla (2007) found that guidance from mentors such as family members is only occasionally educational. James et al. (2010) found similar results, indicating that although children may naturally develop an initial connection to nature in their early years,

as they progress in age they may need more formal guidance and knowledge.

Numerous other studies have reported on the importance of mentors for the emergence of a human-nature relationship. For instance, Farmer et al. (2011) found that parents and other family members commonly had a major influence on individual development of environmental values. Additionally, Chawla (1997; 2007; 2012) has focused much of her research on children in nature, and has found that mentors play a vital role in developing environmental values, concerns, and attitudes through guidance and exposure (Chawla, 1998; 2003).

Participants who scored lower on the connectedness-to-nature scale often spoke of having lacked someone in a mentorship role. Additionally, low scoring participants often omitted referring to mentors at all. It appears that having a mentor was a major difference between those who score high and those who score low on the connectedness-to-nature scale, and may therefore be an important factor in the development of connectedness-to-nature.

The current study highlights the importance of mentors, but is not able to pinpoint at which point in a child's development they are the most necessary. Research by James et al. (2010) also found that mentors with different skill sets may be important at different life stages for development of environmental values in youth. This study did not differentiate between memories at different stages of childhood, and more research should be done to identify the importance of specific types of mentors during different stages of development.

One potential issue with the current findings is the accuracy of recollection by participants, referred to as the “utility of memory” by Nessler (1988). Memory research has found that people are often inaccurate about life events and therefore caution should be applied when interpreting the narrated childhood memories of the participants in this study. However, Howes (2007) argues that recollections of environmental experience are most likely to be valid, especially when dealing with general accounts of important events that are freely recalled. Chawla and Derr (2012) raises a more fundamental issue, stating that people who have developed stronger environmental values over the course of their life may be inclined to recall a larger amount of environmental experiences than actually occurred in reality. To remedy this issue, longitudinal approaches should be applied to future research (Chawla and Derr, 2012).

4.3 Results: Exploring Individual Meanings of Connectedness-to-Nature

Many studies have attempted to measure connectedness-to-nature and similar constructs with various measurement tools (e.g. Kals et al. 1999; Schultz 2002; Mayer and Frantz, 2004; Nisbet et al. 2009), showing that connectedness-to-nature is a construct that has proven difficult to fully capture. The qualitative methodology used in this study allowed participants to expand on what their relationship with nature entailed. Many participants who scored high on the connectedness-to-nature scale expressed statements closely related to those contained in the connectedness-to-nature scale itself (Mayer and Frantz, 2004).

[P1] “Maybe the best way I can quote it is... there’s a line in a song... how does it go now? I’m a drop of the sun; I’m a part of the earth. Something about being a part of the earth. I feel that way.”

[P4] “Nature is my heartbeat. I’m a part of it. I’m no different... I’m as dumb as that tree, ask my wife. But I’m just like that tree, or just like that deer, or just like that goose, or whatever.”

Interviewer: Where do you see yourself fitting in?

[P2] “Another species. Just another species.”

Interestingly, some participants who scored lower on the connectedness-to-nature scale also expressed similar statements.

[P20] “I believe there is a connection... I believe that in nature, when you are out in the forest, or out in the water, it creates peace in your spirit.”

Further discussion with some lower scoring participants revealed that they did in fact feel a connectedness-to-nature:

[P22] “ I suppose [a connection] has been with me all my life, not that I ever really thought about it.”

4.4 Discussion: Exploring Individual Meanings of Connectedness-to-Nature

The construct of connectedness-to-nature may be difficult to measure, which is supported by the fact that numerous tools have been developed in attempts to do so (e.g. Kals et al. 1999; Dunlap et al. 2000; Schultz, 2002; Clayton, 2003; Mayer and Frantz, 2004; Nisbet et al. 2009). Further, connectedness may be difficult to fully capture using quantitative tools. Although the connectedness-to-nature scale (Mayer and Frantz, 2004) was used to measure connectedness-to-nature in this study, results suggest that the scale may be unable to fully capture what connectedness-to-nature means to individual participants. Instead, participant narratives revealed individual meanings of connectedness-to-nature. One explanation that has been raised in the literature is that connectedness-to-nature may be an abstract concept, that is difficult to readily and easily express (Brügger et al. 2011). For example, one participant stated:

[P15] “The humans in nature is the difficult part. We can talk about the program, and how it saves us money... It’s the philosophical part that’s hard.”

A more detailed discussion on personally held meanings of connectedness-to-nature, and the connectedness-to-nature scale (Mayer and Frantz, 2004) as a measurement tool are presented in Chapter (6) of this thesis.

4.5 Results: The Effect of Connectedness-to-Nature on Conservation Attitudes

It is argued that the more connected to nature a person feels, the more likely they are to want to protect it (Mayer and Frantz, 2004). In essence, people who feel connected to nature have an expanded sense of self that includes the natural world. Therefore, hurting nature would ultimately be hurting the self (Schultz, 2002; Mayer and Frantz, 2005). This section of results will focus on the effect that connectedness-to-nature may have on conservation attitudes and behaviour

Connectedness-to-nature was found to have an impact on what landowners have concern for. Regardless of score on the connectedness-to-nature scale, participants in this study expressed altruistic concern for society on a local scale:

“I think it contributes to the enjoyment of the lake by hundreds of people.” [P16]

Moreover, participants also expressed altruistic concern for society on a broader scale.

“There is just a general sense of importance of looking after the land. It's what's good for the farmer is good for the city person is good for the province as a whole.” [P3]

“I just think that if you can have a love of nature, and if you have that, the enjoyment you get out of it... it's important for everybody” [P7]

“You feel kind of good about that because you don't feel like you're getting a handout. You're contributing to everyone around, so.” [P5]

Societal concern was not limited to current society, but was expressed towards future

generations as well. Participants often drew the connection between conservation of their land and the importance of it for future generations:

“I look at a place where it was beautifully forested, and then there is nothing. I say okay, my great grand kids will see this thing grow up again, but not in my lifetime.” [P17]

“That's our interest there, but it is based on preserving the environment how it should be preserved for the next generation... How can we protect this so that everyone has it down the road?” [P9]

“Do no harm. I think so. You keep it for the next generation.” [P5]

“We're only borrowing it. It's there for the next ones to come. The whole generational thing.” [P2]

“You know, you clear cut or you plant but it's going to be your grandchildren not yet born that benefit from that. I think that proper management, continuous management, keeps the bush in good shape.” [P8]

Although similarities in terms of concern for society at large exist across all landowners regardless of score on the connectedness-to-nature scale, higher scoring landowners tended to express higher concern for the biotic community and natural features on their land. For example, expression of biotic concern was demonstrated by acknowledging that landowners' actions provide habitat for a variety of species:

“I'd prefer to just leave it. It's good for life, and you know, squirrels and birds and whatever.” [P6]

“I just thought I would like to keep it for just nature; for birds and fauna and flora.” [P7]

“We hunted here, but I don't know. I look at the deer and say that the reason it runs from you is because it doesn't want to die, so why the hell should I kill it?” [P8]

“I figure the rest of the property is for the nature and the wildlife, and that's important to everybody, not just me.” [P1]

Concern for the biotic community on their property has allowed these individuals to make a connection between their role as landowners and their ability to benefit other beings:

“When you feed the birds...you know, try to help everything along, right...you also feel bad for them too. You see the road; you see the road kill. They’re having a tough time too. You know, you just try to make their lives easier, right? A lot of times, that’s just leaving them alone” [P1]

“Certainly the wildlife enjoys it; the rabbits, the coyotes, the deer. The chipmunks and squirrels seem to find it a haven. And um, they’re around on a daily basis... by keeping the property in good shape, the wildlife and animals that are there tend to enjoy it too.” [P3]

Connectedness-to-nature may also play a role in how landowners value their property, and nature in general. Participants valued different aspects of their land, and saw nature as having different forms of value including personal utility, utility in the form of ecosystem goods and services for society at large, and intrinsic value. Overall, participants in general recognized the value of ecosystem goods and services, and saw the benefits that their conservation behaviour can provide on a local scale:

“I think you realize how important it has been to the whole area, and the development of the area... if we lost all of the swamp, I think our water will be much less viable. The aquifers will dry up” [P13]

“It’s supposed to be important for our water, right? The swamps and the wetlands. You know, just the whole big picture. Things, once it’s gone, you’re not gonna get it back again, right? It’s important to have it.” [P1]

Participants also recognized the benefits that their conservation behaviour can provide to society on a broad scale.

“That whole area was full of red cedar again, crappy wood. But if you think of the amount of CO₂ that is being changed to oxygen by natural processes, that lot had a huge impact overall.” [P17]

“I sort of feel that somewhere in the woods here, and in the woods in the world, there is a plant that if found would probably cure most ills, but we haven't found them yet.” [P8]

Although many participants recognized the value of ecosystem goods and services that the natural features of their land provide, participants who scored lower on the connectedness-to-nature scale tended to view land for its value in a more utilitarian sense. For them, land was viewed as valuable based on the utility it could provide for them.

“It's on a hill and it's wonderful for logging because being on the hills, you get twice the log-length out of every tree.” [P20]

“I suppose the chances of maybe flipping this land for money or something like that.” [P16]

“When I bought, it was actually quite a useless parcel of land.” [P17]

These participants did not only apply a utility perspective to the property as a whole, but also to individual species.

“I've shot groundhogs because they're vermin. They dig holes in the ground where they're not supposed to.” [P19]

“The land is not really good for anything. It's mostly Canadian shield. There are rocks sticking out here and there. It had been cleared away at one point, I guess. It's all grown back; not particularly useful species.” [P15]

Participants who scored lower on the connectedness-to-nature scale valued the land for its utility, and conservation of the land was more of an afterthought for them. Only if the land was viewed as being less valuable from a utility-providing standpoint, conservation seemed a viable alternative.

“I can't really use the property for anything productive. I'm not growing crops or anything like that. So yes, I might as well.” [P19]

“It's useless. You cannot farm it. You cannot do a thing about it except let the trees grow back.” [P18]

In contrast, landowners who scored higher on the connectedness-to-nature scale tended to place more of an intrinsic value on their land. The biotic community on the land had value in and of itself, deeply appreciated by landowners.

“It's a worthy cause to keep it as a conservation area. No humans are probably going to see it, but does that make it any less important? I don't think so. I don't think it has to be enjoyed by people. If you just keep it there for nature, I think that's okay too.” [P7]

“Oh just because I love it. As I say... people have said "would you sell this?" There is no price. You could offer me any sum and I would not sell it.” [P8]

“Well, I look at this property like something of a rainforest. Rainforests have a lot of precious things in them; things that we don't even know are there yet.” [P1]

Who or what landowners have concern for, and how they value their land and nature in general, may inform what they see their role as while inhabiting the land. For instance, participants who express concern for the biotic community, coupled with an appreciation of the intrinsic value of natural features, may feel more inclined to protect the land in their care in its natural state. Two types of land conservation roles emerged during this study: (1) the protector or caretaker, and (2) the owner. Based on concern and beliefs about what is valuable, higher scoring landowners saw their role as protector or caretaker.

“How do I fit in with this? A protector, I guess...” [P8]

“My job has been sort of to watch over it...to make sure nobody comes onto it... I do look over it and know that everything is okay on this property” [P1]

“I think it's our responsibility to look after what we have.” [P7]

“By being a steward, I am looking after it and making sure that it is preserved and not destroyed.” [P8]

By seeing their role as a caretaker, high scoring landowners also consider how their actions can improve the natural features on their property for other life forms.

“The only thing I can think that would improve the situation would be to have a water source other than the creek... Obviously, for any wildlife, they can, you know, have a drink or we could even have fish in there” [P6]

“I’ve been back there pounding away, year after year, creating my little bunny brush piles and promoting wildlife and birds.” [P4]

“Supposedly when the lake freezes over in the winter time, game fish like trout and bass don’t get enough oxygen. I put trout in it twice and whether they survived...” [P8]

Higher scoring landowners may also hold themselves responsible for taking care of the land.

“I think it’s good to let the forest go. Other people cut theirs down, and we try to balance them off... I just think you have to help look after things.” [P5]

“Again, this is just me now. It’s one of my big things in life. I have no children. So in some ways, this property is very important to me in that way.” [P1]

“I have a very keen feeling of responsibility to the outdoors.” [P4]

In Contrast, lower scoring landowners see their role as more of an owner of the land, which is shown through expressed domain over the natural features on their property.

“I firmly believe that the forest belongs to us. We have a right to manage it for our benefit.” [P20]

“I like what I see. I like to maintain it if I see fit. If I want to change it, I will.” [P21]

To summarize this section of the results: All participants generally made a connection between conservation on their land and the provision of ecosystem goods and services to

society as a whole. However, participants who scored lower on the connectedness-to-nature scale often valued the land mainly for the utility it can provide. For them, conservation was a viable alternative only when the land was not seen as suitable for other uses. In contrast, landowners who scored higher on the connectedness-to-nature scale tended to have affinity towards nature, and appreciated the intrinsic value of their land, its natural state, and the biotic community in general.

4.6 Discussion: The Effect of Connectedness on Conservation Attitudes

Schwartz (1977) argued that social-altruistic value orientations informed pro-environmental behaviours. Stern et al. (1999) furthered this work by arguing that biospheric orientations could also be used to predict behaviour. Ultimately, pro-environmental behaviours may not only be informed by concern for other human beings, but can be extended to other species of living beings as well (Turaga et al. 2010). Results from the current study indicate that similarities and differences exist between participants who scored low versus high on the connectedness-to-nature scale with regards to underlying value orientations that inform their conservation attitudes (Figure 6).

Participant narratives provided support for previous empirical research that found moderate positive relationships between connectedness-to-nature and biospheric orientations, and a negative relationship between connectedness-to-nature and egoistic concerns (Schultz et al. 2004; Dutcher, Finley, Luloff, and Johnson, 2007). Regardless of their score on the connectedness-to-nature scale, participants' expressed social-altruistic concern (Schwartz, 1977) for current and future generations of society, indicating that nature should be

protected because it is important to human beings. In contrast, participants who scored high on the connectedness-to-nature scale tended to have increased biospheric orientations (Stern et al. 1999), expressing concern for the wellbeing of other non-human beings. Similar results have been discussed in previous research on connectedness-to-nature (Schultz et al. 2003; Mayer and Frantz, 2004). Further, some participants who scored low on the connectedness-to-nature scale showed signs of egoistic concern, indicated by statements about nature as providing personal benefits. This finding also provides support to existing research (Schultz et al. 2004; Dutcher et al. 2007) about the negative relationship between connectedness-to-nature and egoistic concern.

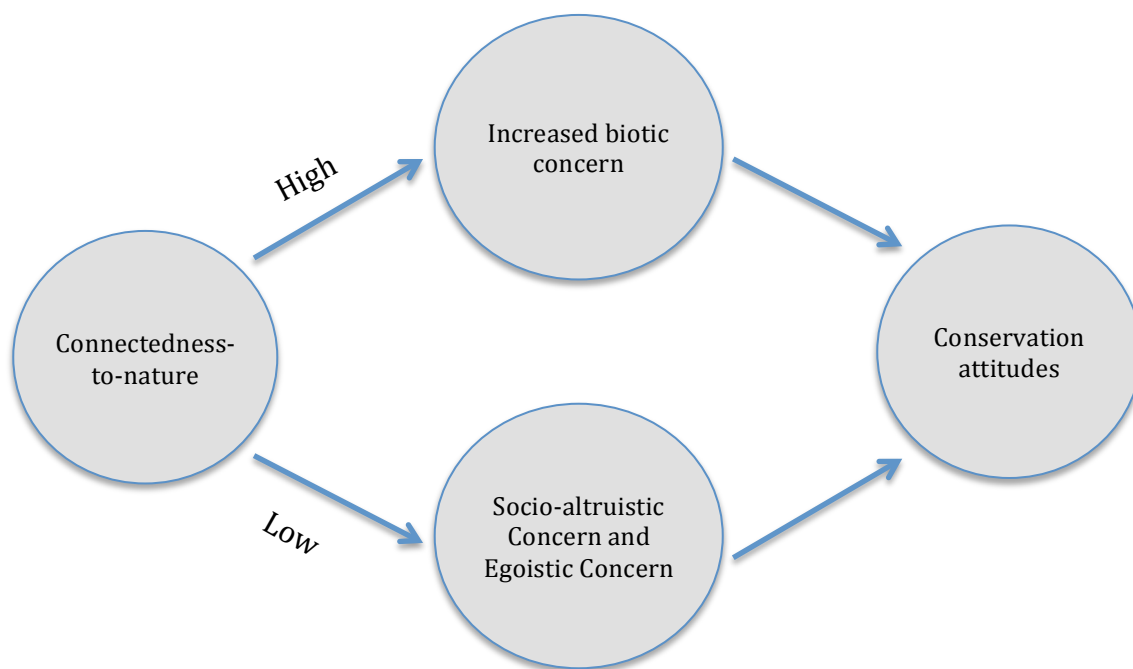


Figure 6: Effects of high and low connectedness-to-nature on conservation attitudes

The results also suggest that differences exist between high and low scoring landowners in the level of priority they attribute to land conservation, and the underlying beliefs that

inform this prioritization. Interestingly, landowners who score lower on the connectedness-to-nature scale may view their land mainly in a utilitarian sense. For them, conservation is seen as a viable alternative only when utilitarian land uses are deemed inappropriate (Polaski, Nelson, Lonsdorf, Fackler, and Starfield, 2005). Landowners who scored lower on the connectedness-to-nature scale were more likely to see land first and foremost as something that is there for them to use, with nature conservation seen as a secondary alternative.

4.7 Results: The Effect of Connectedness-to-Nature on Conservation Activity

One of the main objectives of this research was to understand the role that connectedness-to-nature might play in the expression of land conservation behaviour. The current study results do not indicate any large differences in land conservation behaviours between participants who scored high on the connectedness-to-nature scale, versus those who scored low. Generally speaking, all participants tended to engage in passive land conservation.

Passive conservation largely involved just “leaving nature be”:

“Mostly it's monitoring. Tree counts, bird inventories and things like that.” [P18]

“We maintain the area right around the cottage but we have never done anything with any of the rest of it. We have just allowed it to remain natural; in a natural state.” [15]

“I said we use firewood for winter or whatever. That's mostly dead trees. But the rest of it just sits there.” [P10]

“I mean, if nothing is wrong, I don't fix it. That's the way I am. We haven't had a problem with the back.” [P6]

Passive conservation behaviour was often informed by the belief that nature is perfectly capable of managing itself, without landowner intervention.

“We're not too active in the caretaking business. We pretty much just let it look after itself.” [P5]

“... I don't need to do anything. Let it do its own thing; just leave it alone right? So that's what I've basically done. My job has sort of been to watch over it; to make sure nobody comes onto it.” [P1]

However, not all participants limited themselves to passive conservation. A few participants took a more active approach to conservation of their property.

“I did try and plant 4,000 trees before I even built the house.” [P17]

“I'm using that land, and I've been stewarding it for the last 12 years. I've been clearing it because of the undergrowth, and the dead growth, and whatever was stifling any sunlight or air movement.” [P4]

“We planted in the course of that time, have planted 100,000 trees. Initially, we planted about 1,000 white pines and about 80,000 red pines. Later on, I put in 10,000 cedar trees in one planting.... I never planned on farming it. I thought why not return it to it's natural state” [P8]

Often, the transition from passive to active conservation was largely influenced by ability, including knowledge or technical ability.

“My second career is environmental. As it is, my profession now has a lot to do with the environment. I take this opportunity to put those practices in use on my own property.” [P18]

“It's really because of my geography background and my environmental studies background.” [P11]

Similarly, a lack of knowledge and technical ability also acted as a barrier to engaging in active conservation behaviour.

“I don't really go back there and see what's going on with the plant life. If there is some scrub trees that shouldn't be growing back there, I don't know about it. Maybe I should. Maybe I should be more proactive than just leave things alone. I'm not really environmentally knowledgeable to know what should be done in certain situations.” [P6]

“I just leave it as it is, mostly. Well the point is that the ... you get a list of what you can't do. You can't build on it; you can't modify it. You can't do this or that. But there's not really that much information on what you can or should be doing.” [P23]

“More suggestions from people. Should we be planting more trees? Should we be dredging the pond? What should we be doing with that?” [P23]

Further, as landowners age, they are less able to be as active in managing their land, and physical ability contributed to how they were able to manage their property.

“We're both getting up in years and we're not going to be spending our time swinging axes and stuff like that.” [P5]

Finally, the theme of economic ability also surfaced as an influencing factor on the decision to engage in passive or active conservation behaviour:

“I'm here. I like it. I'm going to do what I can without going out on a limb or spending thousands of dollars or stuff like that.” [P19]

“As soon as it comes out of conservation land, or if it gets reduced in size... the problem being of course that as a minor landowner, I can't afford to manage the way it deserves to be managed.” [P22]

To summarize this section of the results: The majority of participants in this study were engaging in a more passive approach to conservation of their land regardless of their score on the connectedness-to-nature scale. Knowledge and skills as well as economic, technical, and physical ability were identified as influencing factors to the expression of more active conservation behaviours.

4.8 Discussion: The Effect of Connectedness-to-Nature on Conservation Activity

Two typologies of land conservation behaviour emerged in this study. All participants were engaging in passive land conservation behaviour, exemplified by their participation in the conservation programs. Although the term passive conservation has been applied, it still requires landowners to act in the sense that they choose to enroll their properties in the conservation programs. Active land conservation implies action beyond enrolling land in conservation programs, and was found to be much less common than passive conservation behaviour.

The results indicate that the exact type of expressed conservation behaviour (i.e., passive or active) may not be associated with the level of connectedness-to-nature experienced by a landowner. Beery and Wolf-Watz (2014) found similar results, stating that the relationship between various measures of connectedness-to-nature and environmental behaviour appear to be minimal. While connectedness-to-nature may be associated with the willingness to protect the land based on an appreciation of its intrinsic value and out of biotic concern, differences in the conservation behaviours between high and low scoring landowners were minimal. This result supports findings by Raymond et al. (2011), who found that connectedness-to-nature is indicative of personal norms related to land conservation behaviours, but not to behaviour itself, but contradicts findings by Gosling and Williams (2010), who found that connectedness-to-nature is indicative of conservation behaviour. However, the Gosling and Williams study involved farmers, while the current study

focused on non-farming private landowners. Therefore it may be that differences in the landowner characteristics may account for the different outcomes of the two studies.

Pro-environmental behaviours vary greatly in their level of difficulty to complete (Collado et al. 2013). For instance, Stern et al. (2000) argued that pro-environmental behaviours are most likely to occur in situations where the cost and difficulty are viewed as low. Lewis et al. (2008) argued that some environmental behaviours are linear while others are complex, suggesting that there are also different levels of difficulty attached to different pro-environmental behaviours. For instance, the literature generally distinguishes among types of pro-environmental behaviour (Stern et al. 1999; Turaga et al. 2010). Active land conservation may include behaviours that are relatively more difficult to complete than others. For instance, landowners must first be knowledgeable about what types of activities are beneficial to their land, they must also have the skills and tools to complete such tasks (Price and Leviston, 2014). Indeed, this study found that landowners' perceived ability to engage in active conservation activities on their land was a major barrier to action, which echoes the structure of Azjen's (1991) theory of planned behaviour in which perceived barriers to a behavior can limit their expression even if an individual has a positive attitude and intentions to execute the behaviour. In the case of active land conservation behaviour, connectedness-to-nature may predict behavioural intent, but the expression of active conservation behaviour may be limited by ability. Sorice et al. (2011) and Wilcove and Lee (2004) found that habitat restoration is often limited by technical knowledge, or lack of funds. Findings from the current study support these findings. Indeed, the current research found that perceived ability to act is a definitive factor in the transition from passive to

active conservation approach. Knowledge and skills as well as perceived physical ability, financial ability, and technical ability all influence land conservation actions, or inactions.

4.9 Results: The Rural Landownership Decision

Although this study aimed to understand private land conservation through the lens of connectedness-to-nature theory, it did not seem to play a large role in the rural land ownership decision. However, the rural land ownership decision emerged as an important theme in this research, as it provides the requisite opportunity to engage in both passive and active conservation. Further, participants indicated strong, and often long-standing connections to their land, providing further insights into their conservation attitudes and conservation behaviour.

Land in this study comprised of rural properties with natural features of particular interest for conservation purposes located on them, which is why they qualify for tax incentive programs offered by the OMNRF. Certainly, the majority of people in Ontario choose to reside in urban and suburban settings. However, participants in this study chose to live in more rural settings, abundant with natural features. The decision to live a rural lifestyle quickly emerged as a major category in this study.

Participants often discussed their personal history on the properties, offering insight into the choice to live in a rural setting, and the relationship that they have developed with their land. Ultimately, the rural lifestyle decision provided participants with the requisite

opportunity to engage in conservation behaviours. The requisite opportunity to act is a major component of the theory of planned behaviour (Ajzen, 1991). Through discussing their history and experiences with their land, three major themes emerged: (1) familiarity of place, (2) personal enjoyment, and (3) witnessing change.

4.9.1. Familiarity of Place

For many, the decision to live a rural lifestyle was largely based on familiarity. Familiarity meant experience with a specific area developed over time, and often built on fond memories of time spent in that location.

“I think there's a strong connection with both farms” [P3]

“We had a cottage up by Orillia in that general area. I always liked this area. So then I moved up here and looked for a property like this. [P1]

“I would swim here in the river as a kid so when this property came up for sale, I couldn't believe it!” [P9]

Many participants in this study had an emotional and sentimental attachment to the land in question, developed through experience with the land during childhood. For many, the land had been passed on from generation to generation, and was seen as worthy of keeping in the family.

“You, from a psychological point of view, you really develop a sense of place and an affiliation with the land... I've been going there for 40 plus years.” [P18]

“It's my wife's family home. We were able to keep it in the family.” [P11]

“It's a family thing and we are emotionally involved in it. It's like home.” [P20]

“It's kind of... holding onto this little bit of the farm and that little bit of the farm.” [P14]

“So it’s more of a sentimental reason as well”. [P7]

4.9.2. Personal Enjoyment and Quality of Life

The second major theme related to the rural land ownership decision that emerged was personal preference and enjoyment of the land. Participants truly enjoyed the rural lifestyle, and the perceived health and wellness benefits that rural living brings. Residing on a property abound with natural features has brought landowners great happiness.

“That’s where you get the enjoyment. It can be so quiet. You can just sit there. You can watch the animals.” [P16]

“Just having a want...to be privileged... to be able to have this available that you can enjoy it right?” [P9]

“I just... I really like living here and I really appreciate the nature. I really do. It's just one of the simple things in life” [P1]

Part of personal enjoyment of the land was the beauty that these properties provided.

Participants generally found their land and surrounding features to be very aesthetically pleasing.

“It has a beautiful view up to the Calabogie Hills. It's lovely.” [P16]

“It’s beautiful... it's just a gorgeous piece of property.” [P20]

“I do like watching it. I do like being in nature. One of the reasons I am flying is just to see the beauty.” [P17]

“It’s beautiful back there... it's amazing” [P1]

Aesthetically pleasing land was not only perceived to be good for the eyes, but also for improving the quality of life.

“I can see how exceptional that advantage is because you are exposed to the health and the beauty; the health that outdoor living can bring you, and the beauty of the surroundings ... I think aesthetics allow people to ... the beauty of an area allows people to enjoy it more. It's good for the eyes, it's good for the health ... there are lots of rolling hills, I guess they call them drumlands. I think it adds to the quality of life in absolutely every way.” [P1]

Participants also valued their land for the perceived health benefits that nature provided them. For many participants, living on a property with plentiful natural features provided health and wellness benefits, including a feeling of peace and serenity.

“Green space is very soothing” [P16]

“I just feel like it's the most peaceful thing you can do is to be in nature... it just gives you a sense of serenity... I just think there is never a more peaceful time as one you can have when you're in nature with the sights and sounds. I don't know, it's just very peaceful and you feel content.” [P7]

“Just to be able to putt around on my four acres, do my little stuff. That brings me great peace.” [P4]

“The peacefulness, the wildness... it's nature without man having done anything to it.” [P19]

The natural features offer a break from the troubles of every day life. Interacting with their land allowed these landowners to put things into perspective, and find peace and calmness.

“Yeah. When you see the trees are growing, the birds are fed, everything is healthy and doing fine. The cars broken down, but it doesn't matter because the birds are getting fed. We as human beings often feel you have to do this, we have to do that, you need all this money. You don't! You really don't. And when you get into the forest and see how things really work, without all that, um, it helps you be at peace and it puts things back into proper perspective.” [P20]

“I feel like a steward for nature. I feel it's all part of the big plan; just try not to destroy it and try to work with it. Yeah, you just fit in. We're just one little piece of the whole big deal.” [P11]

“I mean, when I'm sitting out here, this time of year the swamp just comes alive. I love that sound. It's like I know that everything is good again.” [P1]

Further, interacting with their land offered an important outlet to maintain mental health.

“I feel it far more. Probably the reason I'm not in prison today is because I'm connected to the land. I guess otherwise, the kind of personality that I have would probably be penalized if I didn't have an outlet. It's right behind my family in terms of importance in my life... I feel that it's still the redeeming facet of my life; it's where I go to discharge and recharge, not unlike a water system. I discharge and recharge” [P4]

“I think that's important with the urban planning and how it ties in is that um, you know, I think it's very calming. Like I said I have to go plant trees with Jim to find my headspace.” [P2]

4.9.3. Witnessing Negative Environmental Change

Finally, almost all participants discussed witnessing negative environmental change in the form of land conversion from natural areas to built form. Some participants went as far as saying that they chose to live a rural lifestyle to escape from urban life:

“I have resisted all efforts to sell parts of parcels, simply because I don't like the countryside to be broken up.” [P3]

“We wanted to get away from the big smoke of Mississauga. When you think about it, we were running away from what mankind had already ruined.” [P22]

More than simply a desire to live a rural lifestyle, witnessing negatively perceived change has given some participants motivation to act.

“The swamp used to be a very large area, but there has been a lot of encroachment on it. We have to keep what we have left” [P13]

“We're preserving it because green space now is going to be limited in some ways. Our cottage isn't that far from Ottawa.” [P16]

“That's another reason why I want to keep it as conservation land because I've seen Whitby and what can happen. They can't let an open space just happen in Whitby.” [P7]

To summarize this section of the results: Many participants decided to own rural land based on familiarity, and a sentimental desire to keep such land in the family. Further, many participants decided to own land based on personal preference, enjoyment, and a desire for a higher quality of life. They also believed that they gained mental health benefits from a rural lifestyle, including peace, calmness and serenity. The emerging theme of conserving land in the face of change will be discussed in more detail in the next chapter.

4.10 Discussion: The Rural Landownership Decision

Understanding more about the conservation attitudes and behaviour of private landowners is an important step towards increasing the quantity and quality of conservation in general (Kamal et al. 2015). At the core of private land conservation is the land itself. Regardless of a landowner's score on the connectedness-to-nature scale, a number of motives emerged that caused a motivation for living a rural lifestyle that ultimately provided the opportunity to engage in passive or active land conservation behaviour. For many, the land in question had been in the family for generations, with sentiment and strong emotions attached to it. Fond memories of living the rural lifestyle helped to influence the decision to continue preserving this land. These findings echo the results of Drescher (2014) who emphasized the importance of the affective dimension for rural land ownership and private land conservation.

But many participants did not have land passed down from previous generations, and have developed a deep connection with their land that began with a more recent decision to live a

rural lifestyle. Participants in this study largely fit the definition of amenity migrants, or people who seek a rural, non-farming lifestyle (Cooke, 2015). Amenity migrants often seek the natural values and aesthetics of rural areas, pursuing the ‘simple life’ over a fast-paced urban lifestyle (Argent et al. 2010). Indeed, participants often spoke of the simple life and the aesthetics of living in a naturalized area. However, enjoyment of the land went much deeper than aesthetics and was associated with feelings of love and affection for their land, which is supported by results found by Drescher (2014). Such positive experiences of personal enjoyment may in turn lead to an increased willingness to protect nature (Cooke et al. 2015).

None of the participants in this study decided to purchase his or her land with the initial intent to focus on conservation. Instead, engaging in passive or active land conservation arose as consequent to the initial decision to move to a rural area in the first place. Over time landowners have developed an attachment to the nature on their property because of the enjoyment that it brings. Landowners have witnessed negative environmental changes in the form of urban sprawl, which has triggered a desire to protect nature. Similar results were discussed by Walker and Ryan (2008), who found that strong levels of support for conservation to be correlated with place attachment.

The relationship between people and place is complex, and understanding the relationships between people and place can be illusive (Walker and Ryan, 2008). Familiarity of place arose as a major theme in this research that is akin to the idea of place attachment, defined as an individual’s level of commitment to a place, revealed through social involvement and

subjective feelings (Gerson, Stueve, and Fischer, 1977). Many participants were connected to specific places from their past that held personal meaning, importance, and value and were seen as worth protecting. These results are similar to findings from Vaske and Korbin (2001), and Farmer et al. (2011) who found that place attachment may be associated with conservation behaviour. Further, Gosling and Williams (2010) argued that landowners had built an emotional attachment to their land that went beyond economic value, which is supported by the results from the current study. Nisbet et al. (2009) point out that people may be more receptive to act when their own personal emotions are involved. The participants in the current study have formed emotional connections with their land that have developed through years of interaction, and they may therefore be more willing to protect it from change. Previously, Gosling and Williams (2010) proposed that connectedness-to-nature and place attachment were similar constructs, that potentially led to biospheric concern, and ultimately pro-environmental behaviours. The current study found support that both connectedness-to-nature and place attachment might be indicators of conservation attitudes, and ultimately land conservation behaviour.

The rural lifestyle decision, and to some degree the land conservation decision, was influenced by witnessing negative changes. Similar findings were reported by Tanner (1980), who found that witnessing the loss of nature and wilderness motivated study participants to choose a career in conservation. Moreover, Chawla (1998; 2012) argued that witnessing negative change such as the loss of valued habitats can impact environmental behaviour later in life. More recently, Drescher (2014) noted observing negative land cover change as a motivator for private land conservation in southern Ontario. Witnessing

negative change led some participants to move away from urban surroundings in pursuit of the “simple life”, but it also helped to inform land conservation behaviour. Negative change in the form of urban sprawl and habitat destruction increased awareness of environmental problems, while the move to rural surroundings provided the opportunity to help alleviate the problem. In the case of habitat destruction, private landowners were able to ensure conservation of nature on their properties. Witnessing negative environmental change can be viewed as a threat to a valued object in value-beliefs-norms theory (Stern et al. 1999). In Stern’s theory (1999), personal norms are activated when an individual believes that there are threats to a valued object, and that their actions can help to eliminate that threat (Turaga et al. 2010). In this study, the perceived threat was exemplified by negative environmental change, while beliefs about ability to take action to alleviate the threat was exemplified by choosing to conserve nature on their land by participating in land conservation programs.

4.11 Analysis Summary

The analysis so far was presented in three separate, but interrelated sections. The first section introduced factors that might influence the development of connectedness-to-nature in Ontario landowners. In the second section, the effect that connectedness-to-nature has on conservation attitudes and behaviours was analysed by comparing and contrasting between participants who scored high on the connectedness-to-nature scale, versus those who scored lower. Further, section two also identified the perceived land ownership role, and how land conservation is expressed in either passive or active approaches by landowners. The final section focused on the rural landownership decision, without which conservation of the

land would be non-existent. The subsequent chapter will focus on a broader discussion and integration of findings, including implications for planning theory and practice.

4.6 Key Findings

1. Unstructured, positive experiences in nature, as well as having a mentor to provide exposure and guidance may lead to the development of a feeling of connectedness-to-nature.

2. The feeling of connectedness-to-nature is associated with increased biotic concern. Connectedness-to-nature was not found to be indicative of increased levels of active land conservation. Instead, landowners may view active land conservation as an undertaking involving more complex behaviours. As such, understanding private land conservation behaviour may benefit from utilizing numerous social-psychology theories to further understanding.

3. The primary motivators to pursue the rural lifestyle were familiarity with this way of life, personal enjoyment, and perceived health and wellness benefits. Landowners have developed an emotional connection and familiarity with their land, developed during childhood, or beginning with the initial decision to live a rural lifestyle. This emotional connection and familiarity may motivate them to protect it against previously experienced negative land cover change.

5.0 Integrated Discussion

Previous research indicated a need for further exploration on the effect that connectedness-to-nature has on the expression pro-environmental behaviour (Mayer and Frantz, 2004).

While research has since focused on understanding the effect that connectedness-to-nature has on various pro-environmental behaviours (e.g. Nisbet et al. 2009), and on land management in working landscapes (e.g. Gosling and Williams, 2010; Raymond et al. 2011), very little has focused on land conservation behaviours as a specific type of pro-environmental behaviour in a non-farming landscape. The current research sought to fill this gap, while also looking to build an exploratory model of land conservation behaviour of Ontario landowners. Salient findings from the study are (1) positive childhood experiences in nature and having a mentor may aid in the development of connectedness-to-nature, (2) landowners who are connected to nature may be more inclined to see conservation as a land-use priority, (3) individual landowners have varying conceptions of connectedness-to-nature which the connectedness-to-nature scale may fail to capture, and (4) integrating various existing social-psychological models may help to explain the complex pro-environmental behaviour of private land conservation.

5.1 Developing Connectedness-to-Nature

The first objective of this study was to understand what factors might lead to the development of connectedness-to-nature. This study revealed that unstructured, positive experiences in nature, and having mentors are important factors in the development of

connectedness-to-nature (Figure 7). These factors have been identified in other studies focused on understanding similar phenomena such as interest, skills, and careers in nature (Chawla, 2007; Tanner 1980; Bixler et al. 2010; Farmer et al. 2011). Results from the current study suggest that landowners who score high on the connectedness-to-nature scale may place higher priority on land conservation, while numerous other studies have found that connectedness-to-nature and other similar constructs are associated with pro-environmental attitudes (Kals et al. 1999; Mayer and Frantz, 2004; Gosling and Williams, 2010; Nisbet et al. 2011; Raymond et al. 2011). With this in mind, encouraging experiences that lead to the development of connectedness-to-nature is a worthwhile endeavor. The difficulty lies in how to provide such experiences to children. Ultimately, children depend on adults to provide opportunity to experience nature. Indeed, this study found that having a positive mentor is an important factor in developing connectedness-to-nature. Mentors were found to play a variety of roles, from educational to exposure oriented. Mentors with different skill sets may be required at different stages in development to encourage and increase the development of connectedness-to-nature (James et al. 2010).

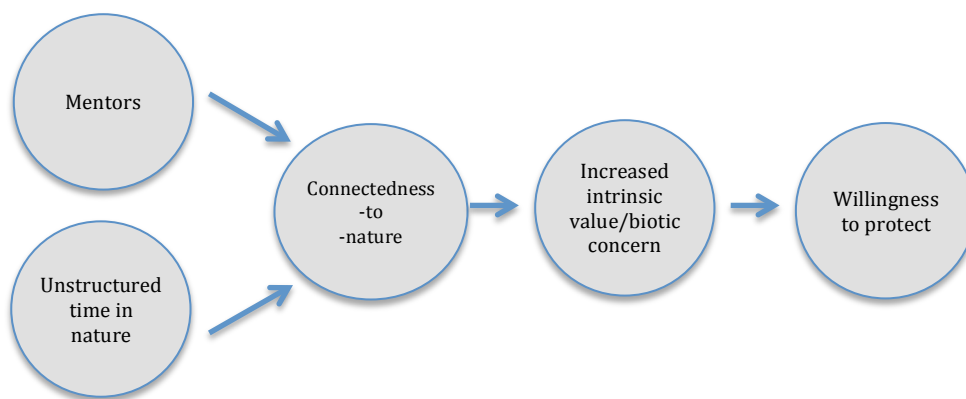


Figure 7: Development of connectedness-to-nature and effect on land conservation

5.2 The Effect of Connectedness-to-Nature on Conservation Attitudes and Behaviour

The second objective of this study was to explore the effect that connectedness-to-nature might have on conservation attitudes and behaviours in Ontario landowners. What consequences does being connected to nature, or not, have for conservation attitudes and behaviours? While studies have explored the link between connectedness-to-nature and a variety of pro-environmental behaviours (Mayer and Frantz, 2004; Davis, Green, and Reed, 2009; Müller, Kals, and Pansa, 2009; Schultz, 2001; Nisbet and Zelenski, 2011), few have differentiated land conservation as the specific type of behaviour. This study focused on the effect that connectedness-to-nature has on land conservation behaviour as a specific type of pro-environmental behaviour in a non-farming context.

The results of the current study suggest that participants who scored higher on the connectedness-to-nature scale tended to have increased biospheric concerns towards nature (Dunlap and Van Liere, 1978; Stern et al. 1999). In contrast, participants who scored lower on the connectedness-to-nature scale tend to have more socio-altruistic and egoistic concerns, and view land in a utilitarian sense. A utilitarian view of land ownership was not observed in participants who scored higher on the connectedness-to-nature scale, which may have significant implications for further understanding of private land conservation behaviour. For instance, participants who view land ownership in a more utilitarian sense may be hesitant to set aside land for conservation because of the opportunity cost associated with doing so (Polasky, Nelson, Lonsdorf, Fackler, and Starfield, 2005). If such individuals

own land that is deemed to be of high quality for agricultural purposes, land uses such as recreation or agriculture are given priority over conservation (Cassingham et al. 2002). Therefore, the opportunity cost of conserving land that is seen to be useful for other purposes represents a constraint. Such constraints do not exist on land that is deemed as marginal, and utilitarian landowners may only then see conservation as a viable alternative land use. This was certainly the case for the few landowners in this study who currently reside on agricultural land, and supports findings from other studies (Raymond et al. 2011; Gosling and Williams, 2010), which acknowledged that landowners of working landscape may be constrained by loss of income from primary production settings. While low-scoring landowners tended to have a utilitarian view of the land and see it as a livelihood asset, high-scoring landowners tended to view their land and nature as a lifestyle asset (Abrams and Bliss, 2013). Additionally, stewarding the land may even increase the value of nature as a lifestyle asset, especially valued by non-farming amenity migrants (Cooke et al. 2015). For landowners who score high on the connectedness-to-nature scale, using the land for conservation purposes may not have an opportunity cost associated with it.

Although high connectedness-to-nature has been found to be associated with biotic concern, and potentially more willingness to participate in conservation behaviour (Müller et al. 2009; Gosling and Williams, 2010; Raymond et al. 2011), low connectedness-to-nature does not necessarily mean a lack of conservation attitude, or even land conservation behaviour for that matter (Beery and Wolf-Watz, 2014). That is to say, a high score on the connectedness-to-nature scale (Mayer and Frantz, 2004) is not a requisite for conservation attitudes and conservation behaviour. Further, concern for the environment and attitudes

towards conservation are not always translated into behaviour. Nisbet et al. (2009) echo similar thoughts, stating that although many people hold concern for environmental issues, such concern is not always reflected in behaviour, and vice-versa. Participants who scored low on the connectedness-to-nature scale in this study still engaged in conservation behaviours on their land by participating in conservation programs. Therefore, conservation attitudes and outcomes are often influenced both by underlying altruistic concerns, as well as biospheric concerns (Stern et al. 1999).

The findings should be placed in the context of similar research in this field of study. For instance, Gosling and Williams (2010) found that connectedness-to-nature may be associated with increased conservation of native vegetation, while Raymond et al. (2011) found that connectedness-to-nature was related to personally held norms about conservation, but not behaviour itself. The current study suggests that connectedness-to-nature may make land conservation more acceptable as an alternative land use, if the perceived ability to act was increased by removing constraints, as outlined in the proposed model (Figure 9). However, while the study results suggest that connectedness-to-nature might be associated with willingness to commit to land conservation behaviour as a type of pro-environmental behaviour (Müller et al. 2009), this link needs further verification (Nisbet and Zelenski, 2011).

5.3 Re-Evaluating the Connectedness-to-Nature Scale

Previous research has critiqued the ability of the connectedness-to-nature scale to measure connectedness-to-nature (e.g. Perrin and Benassi, 2009; Beery and Wolf-Watz, 2014).

Interestingly, the narratives of some landowners who scored low on the connectedness-to-nature scale revealed that they nevertheless felt a connection to nature. An interpretation of what this means for the connectedness-to-nature scale is now offered.

First, the connectedness-to-nature scale as a measurement tool may fail to fully capture connectedness, because it may be a concept that holds different meanings to different people. Open-ended interviews allowed individuals to more fully describe their views on the human/nature relationship. This point supports findings by Klassen (2010), who argued that scores on the connectedness-to-nature scale in the study seemed insignificant, while participant interviews revealed significant differences between study groups. One of the reasons that the connectedness-to-nature scale has been widely utilized as a tool to measure the construct of connectedness-to-nature is because of its demonstrated empirical support (Mayer and Frantz, 2004; Beery and Wolf-Watz, 2014). However, in follow-up interviews with low-scoring landowners, some stated that they did indeed felt a connection to nature, contrary to what their connectedness-to-nature score indicated.

Although the connectedness-to-nature scale as a measurement tool is empirically supported to be a valid measure of the connectedness-to-nature construct (Nisbet et al. 2009), this study suggests that connectedness-to-nature varies between individuals. Indeed, some

participants who scored low on the connectedness-to-nature scale still felt a connection to nature that the connectedness-to-nature scale failed to capture. It could be that the connectedness-to-nature scale does not measure an emotional connection as Mayer and Frantz (2004) claim, but instead measures cognitive beliefs about the human-nature relationship (Perrin and Benassi, 2009; Beery and Wolf-Watz, 2014). Of course, it might also be that these landowners misunderstood the meaning of the connectedness-to-nature concept or that they were unable to consciously and readily reflect on their personal connection with nature (Brügger et al. 2009), in which case the connectedness-to-nature scale might have performed well.

Further, the term ‘nature’ as it exists in connectedness-to-nature may represent a concept that is too abstract for people to easily comprehend. The current study suggests that participants consider nature to be a specific locale, and supports work by Beery and Wolf-Watz (2014) who argue that the environment as ‘nature’ is geographically undefined and abstract, and might better be substituted by the geographical concept of ‘places’.

Connectedness-to-nature and attachment to place may share common elements, as other scholars have recently explored (Gosling and Williams, 2010). Although the current study did not focus on place attachment, participant narratives suggest that nature as specific places was important for the development of connectedness-to-nature.

The results of the current study do not definitively show that substituting ‘nature’ for ‘places’ would be beneficial to understanding the relationship between experiences in nature and pro-environmental behaviours such as land conservation. However, they suggest

that the meaning of ‘nature’ is subjective and varies among individuals. Individual beliefs about where and what ‘nature’ is, and their relationship with nature are largely informed by previous experiences in specific, or similar locations that help to build familiarity. For instance, Clayton (2003) defined the term environmental identity as

“A sense of connection to some part of the non-human natural environment, based on history, emotional attachment, and or similarity, that affects the ways in which we perceive and act towards the world; a belief that the environment is important to us and an important part of who we are.” (45)

Further, place attachment can be defined as the positive bonds that develop between a person towards a geographic location (Altman and Low, 1992; Raymond et al. 2011), and can be seen as an affective relationship between a person and an environment (Altman and Low, 1992; Hidalgo and Hernandez, 2001). Similarly, connectedness-to-nature is also a measure of affective relationship, although it largely refers to non-specific nature rather than a specific geographic locale. The emotional attachment to the experiences and memories interacting with nature in specific locations is important, and may play a critical role in the decision to protect the ‘nature’ that exists in these locations. This finding supports existing research by Walker and Ryan (2008), who found that support for conservation initiatives is correlated with place attachment, while Raymond et al. (2011) encouraged further research to include place attachment in models of pro-environmental behaviour. The results also echo findings from (Drescher, 2014), who found themes of place attachment and association to be important factors in private land conservation.

5.4 Theoretical Land Conservation Behaviour Model

A main objective of this study was to develop an exploratory model of land conservation behaviour in Ontario landowners through the lens of connectedness-to-nature theory. Results suggest that connectedness-to-nature may not fully capture individual feelings of connectedness, and that land conservation behaviours are complex and non-linear (Lucas et al. 2008). Understanding the land conservation behaviour of Ontario landowners may benefit from utilizing various existing social-psychological models, an approach that has been applied in past research (Turaga et al. 2010). An exploratory model that is grounded in the data is presented (Figure 9).

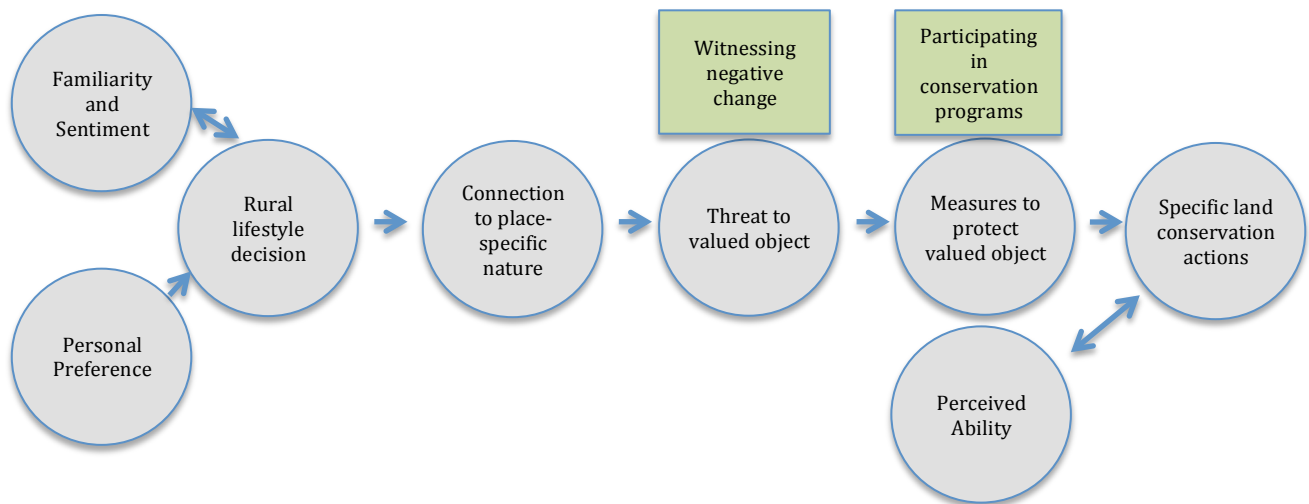


Figure 8: Theoretical model of land conservation behaviour grounded in the data

In this model land conservation begins with the initial decision to live a rural lifestyle. Participant narratives revealed that the rural lifestyle decision was largely based on either familiarity with, or sentiment towards the land, or on personal preference to live in the

country. The rural lifestyle decision is an important component of the proposed model, and an emerging body of literature has begun to explore the phenomenon as amenity migration (Cooke et al. 2015). Over time, landowners have built a relationship with the nature that they are familiar with. For many, connectedness is developed through positive experiences socializing with nature on their land, and may develop well beyond childhood. For instance, although nature socialization occurred for many participants during childhood, it was not discussed by every participant. Instead, some participants noted increased interaction with nature beginning with the rural landownership decision. As such, the relationship between sentiment and the rural lifestyle decision may be bi-directional. While sentiment may be developed from childhood, it may also be a function of time, with sentiment and enjoyment beginning and increasing over time from the rural lifestyle decision. Indeed, a similar study exploring factors that influence the choice of environmental vocation found that nature socialization may be important into adulthood as well. (James et al. 2010).

As mentioned previously, the current study supports the notion that connectedness-to-nature and related concepts may be too abstract, and may be difficult to comprehend for the layperson contemplating the human-nature relationship (Brügger et al. 2011). As such, the model developed through this research understands nature as a specific place, or a number of places (Beery and Wolf-Watz, 2014). Beginning with their exposure to such places, landowners develop place-specific connections to nature, and nature becomes a valued object (Stern et al. 1999).

The proposed model includes elements adapted from the values-beliefs-norms theory (Stern et al. 1999), which states that actions flow from beliefs that valued objects are under threat,

and that actions taken by an individual can help to alleviate the threat, thus restoring the valued object (Stern et al. 1999). The results suggest that for landowners the valued object is the land and its natural features, while witnessing negative environmental changes represents a threat to the valued object. More specifically, urban sprawl has often been seen as a threat to the valued object. Sprawl can be seen as a negative environmental change, acting as a catalyst for increased support for nature protection (Walker and Ryan, 2008). Living a rural lifestyle provides landowners with the opportunity to act to alleviate the threat to their valued objects. Specifically, by participating in conservation programs or applying a passive or active approach to land conservation, they believe that they have the ability to protect their land. This action represents the steps taken to alleviate the perceived threat to the valued object, as outlined in the values-beliefs-norms theory (Stern et al. 1999).

Active land conservation may be viewed as a specific type of pro-environmental behaviour that can be further broken down into individual land management activities. Perceived ability is the degree to which a person believes that they can engage in activities. Perceived ability as described in this model is similar to perceived behavioural control in the theory of planned behaviour (Ajzen, 1991), which states that control beliefs influence perception of the resources available to perform an action. An individual's behaviours are limited by both social and physical contexts in which they function (Shove, 2003). Technical knowledge, monetary ability (Raymond et al. 2011), and physical state may be important contextual factors that contribute to the perceived ability to participate in conservation activities (Price and Leviston, 2014). Further, if lacking, these factors can be viewed as constraints on

conservation activities. As such, landowners who lack technical knowledge about land conservation, have limited monetary funds to set aside for conservation activities, or are physically unfit to perform conservation activities, are less likely to engage in active conservation (Kammin et al. 2009). Interventions to overcome perceived ability constraints are discussed in the following section.

Interestingly, a bi-directional relationship may also exist between perceived ability and increased conservation activity as a function of time. While perceived ability may act as a constraint towards increased land conservation activities, engaging in more conservation activities may also help to raise perceived ability. This relationship has been discussed in recent literature, including Cooke et al. (2015) who found that many rural landowners learn to conserve their land by doing, or actively engaging in conservation behaviours.

As Ajzen (1991) states, “as every student of psychology knows, explaining human behaviour in all its complexity is a difficult task.” Land conservation behaviours, depending on the specific behavioural expression, may be more difficult to engage in than other types of pro environmental behaviours (Lucas et al. 2008). The results indicate that connectedness-to-nature may have an effect on increased land conservation activity when combined with other factors. For example, whether or not participants engaged in a more active approach was largely based on their actual or perceived ability to engage in specific activities, similar to perceived behavioural control in Ajzen’s theory of planned behaviour (1991).

Turaga et al. (2010) argue that pro-environmental behaviours such as land conservation activities are more likely to arise when the benefits are directly apparent to the decision maker, and the inconveniences of actions are small. In the case of active land conservation, many landowners may be unaware of the benefits of their actions (Cassingham et al. 2002; Pannell and Wilkinson, 2009), and may not fully understand the wide range of actions that they could engage in with varying levels of convenience. Therefore, interventions aimed at overcoming these barriers may result in more active conservation behaviour.

Interventions can have different forms, from simple education and outreach, to technical and material assistance. The current study did not explore interventions that may be used to increase conservation behaviour. It would be beneficial to explore whether or not conservation activities differed between participants who scored high on the connectedness-to-nature scale, and those who scored low, after interventions aimed at increasing land conservation activities were applied. The results suggest that those who scored higher on the connectedness-to-nature scale might be more inclined to further their conservation activities (Mayer and Frantz 2004; Müller et al. 2009; Nisbet and Zelenski, 2011). Future research should seek to explore this hypothesis to attain a better understanding of the interaction of connectedness-to-nature with interventions that are applied to remove behavioural constraints.

In this research, passive conservation behaviour was defined as simply participating in formal conservation programs, while active conservation behaviour required an increased level of conservation activity. It is important to note that an apparent lack of conservation

ethic does not necessarily result in a subsequent lack of conservation behaviours. For instance, it is likely that some landowners were participating in the conservation programs solely based on the financial incentive or other rational factors, which were not included in the model. As it turned out, not all participants had strong conservation ethics, which means that their choice to engage in passive conservation behaviour may not be an example of land conservation. Instead, conservation behaviour may be a more appropriate term, while conservation may be reserved for those who act based on strong underlying conservation or environmental ethics that take into account the interests of society, future generations and other species (Worrell and Appleby, 2000).

5.7 Planning Implications: Conservation Program Design

Rural landowners in this study were largely found to be engaging in passive conservation, meaning they are not actively managing the natural features on their land. As discussed, the difference between passive and active land conservation is largely influenced by ability in the form of technical, physical, and financial ability to act. If passive conservation of land is the desired outcome, then the existing OMNRF programs are appropriate. However, if an active approach is the desired outcome, then more educational, technical, and outreach assistant is required.

Findings suggest that a lack of technical knowledge is a major barrier to engaging in active land conservation, a finding that has been the focus of previous research. Research by Kammin et al. (2009) found that providing technical and material assistance is essential for

maintaining the quality of wildlife habitat over the long term. The current study did not focus on understanding the degree to which rural landowners are knowledgeable of specific conservation activities, but the results suggest support for the findings from previous studies. For instance, Hersha et al. (2013) found that riparian landowners have limited knowledge of ecology as well as limited awareness of riparian issues, which become major barriers to increased action.

A key issue raised by participants was the lack of contact from Ontario Ministry of Natural Resources and Forestry staff. This is a troublesome finding, given that education and outreach have been found to increase land conservation behaviour. For example, Cassingham et al. (2002) found that education about the ecological significance of land increases landowner willingness to protect. Additionally, Pannell and Wilkinson (2009) argue that training is beneficial when the learned activities are simple with low learning costs. It appears that in the context of Ontario landowners, active land conservation could be increased through increased contact from Ministry staff and education about simple land conservation activities.

Recent research has also shown that interpersonal contact is an important factor in learning about conservation (Ryan 2009), a finding that is salient to the current study. Paloniemi and Vainio (2011) argue that landowners require competent professionals to provide information about what types of conservation activities should be engaged in, and assistance to engage in those activities that are more difficult. Recent research by Cooke et al. (2015) focused on understanding how amenity migrants learned to engage in

conservation behaviours. Findings indicate that many first-time rural landowners “learn as they go”, and outreach could help to shape their land management and conservation behaviour.

Limited government resources require careful thought into how to improve conservation programs. Interpersonal contact may best be applied in situations where the land is deemed to be of high environmental importance (Tyson et al. 2004). Outreach efforts must also be tailored to individual landowners, especially with regards to length of tenure. Old-stock landowners may hold prior assumptions about land management and conservation activities that are hard to sway. Conversely, newer landowners may require assistance in developing their conservation attitudes and behaviour (Cooke et al. 2015). Further, it should be noted that the current study included only participants who are already participating in conservation programs, and therefore may already have strong conservation attitudes. Betts et al. (2002) argue that it may be beneficial to actively solicit landowners who are not currently participating in such programs.

Participant narratives revealed that a lack of technical knowledge limited their ability to engage in active land conservation, while explicit statements revealed a lack of contact from environmental professionals. Therefore, targeted outreach at owners of land that is deemed to be of high ecological significance, and education about conservation activities that are easy to engage in and ecologically beneficial (Paloniemi and Vaino, 2011) may help to increase conservation activities in Ontario landowners.

5.8 Planning Implications: Urban Green Space

Though a relatively new profession, planning shapes the every day lives of citizens by planning the communities in which they reside. As such, good planning practice has the ability to, and should aim to enrich, the quality of life for all citizens (Sandercock, 2004). Of course, humans require places to live, and the overwhelming trend in Canada has been to transition from rural to urban areas. Currently, 81% of Canadians live in urban areas, and that number is expected to continue to grow (Olive, 2014). The current study found relevant points to be considered by the planning profession.

First, exposure to nature was found to be beneficial for feelings of health and wellness. This finding is well supported in the research (Kuo 2001; Dearborn and Kark, 2010; Douglas, 2012). If the goal of the planning profession is improve the quality of life for all residents by creating equitable, and truly livable cities, then the importance of naturalized areas cannot be overlooked.

For instance, landowners associated nature with positive feelings, which may help to strengthen their desire to conserve it (Cooke et al. 2015). Additionally, Chawla (1999) argues that children need first-hand experience with nature to become passionate about its protection. Unfortunately, many people lack access to a specific natural place to become emotionally attached to such as a cottage, homestead, or other significant place. Instead, many people gain familiarity with numerous, or variable places, which can also provide for environmental socialization. However, cities often act as barriers to accessing nature (Beery

and Wolf-Watz, 2014). A growing body of literature is recognizing that the opportunities to interact with nature are becoming less readily available in urban areas (Vadala et al. 2007), which may lead to less people with strongly held environmental concerns and orientations (Louv, 2005; Miller, 2005; Wells and Lekies, 2006). Therefore, the ability to connect with nature in urban areas should be enhanced by being engrained in every day life; in parks and in playgrounds; in cityscapes and walkways in a mosaic of green spaces (Chawla, 2012). However, not all green spaces offer the same benefits to developing a connection to nature. For instance, although urban sporting fields and other large ‘manicured’ areas are accessible to a greater population, they provide little true nature (Derby, Piersol, and Blenkinsop, 2015). This may require a re-evaluation of how nature is provided within modern cities.

Planners ultimately may have the ability to help indirectly influence citizens’ conservation ethics by providing urban green spaces that are truly naturalized. Dense populations in urban areas mean the ability to reach a much wider population, as Sanderson and Huron (2011) state “cities are the most important places for conservation exactly because the majority of people live there.” If we do not want to raise generations of people with environmental awareness but lacking environmental connectedness, cities must continue to grow with nature and conservation in mind.

Population growth, coupled with the desirability of single-family home ownership means the likelihood that existing naturalized areas will continue to face pressures. Implementing policies and tools to ensure the integrity of existing natural areas remains, and that new

naturalized areas are planned with local ecology in mind can minimize these pressures. For example, some North American cities currently have by-laws in place that protect natural features, such as trees (City of Guelph, 2015). Further, policies and guidelines that set minimum designations for naturalized areas in park space could also increase the quality of nature in existing and new public parks. Currently, cities in Western Canada such as Edmonton, Calgary, and Regina have initiatives in place to naturalize urban green spaces, and exemplify how the planning practice can increase exposure to nature by implementing naturalized urban green spaces. One of the main goals of Calgary's initiative is to promote and increase biodiversity (City of Calgary, 2015). Similarly, non-profit organization Evergreen has created a publicly available guidebook focusing on urban naturalization in a policy and program context. One of the benefits listed is to improve public education and outreach (Evergreen, 2001). Case studies and resources such as these should be seen as valuable assets, and applied on a wide scale as urban areas continue to grow.

As people continue to migrate towards urban settlements, the possibility of a disconnection from nature becomes much more apparent. At an individual scale, feelings of personal enjoyment, happiness (Gosnell et al. 2011; Drescher, 2014) and mental health benefits may drive our desire to connect to nature. On a large scale, our livelihood and wellbeing as a species depends on the wellbeing of nature (Hein, van Koppen, de Groot, van Ierland, 2005). The benefits of encouraging feelings of connectedness-to-nature outweigh the potential risks of a generation that instead feels disconnected from nature, which is a topic that has recently gained mainstream attention from authors such as Richard Louv (2005). Youth need to connect to nature so that they can at least have the opportunity to develop a

relationship over time. Hopefully that relationship is positive, and they begin to see nature as a valued object that is worth protecting.

6.0 Limitations

First, the research only includes cases that are currently participating in the OMNRF conservation tax incentive programs. Having another sample of cases who are not participants in the OMNRF programs would allow for comparison, and a more thorough understanding of the role that connectedness-to-nature may or may not play in land conservation. Participants who are enrolled in the OMNRF programs may have been biased in their responses, given how their existing land management activities may differ from those of landowners who are not participating in formal conservation programs. (Heckman, Ichimura, Smith, and Todd, 1998; Smith and Elkin, 2007; Peck, D'attoma, Camillo, and Guo, 2012; Momen-Haravi, 2015). Landowners who are not currently participating in the conservation programs were not included because they generally did not indicate they were interested in qualitative phase of the study. Future research would benefit from including landowners who occupy land that is eligible for inclusion in the OMNRF conservation programs, but are currently not participating in these programs.

Second, the study was based on self-reported land conservation activities. Participants could be biased in their responses, especially having filled out the survey prior to the interviews (Adams, Sourmarai, Lomas, and Ross-Degman, 1999; Podsakoff, MacKenzie, and Lee, 2003; Kantner and Lindsay, 2012). Further, the OMNRF programs have specific criteria that have to be followed to maintain eligibility. Participants may have been wary of

revealing details what would jeopardize their eligibility for participation in the programs, even though the researcher was not affiliated with the OMNRF.

Third, participant memory, which in many cases was drawn from many decades ago, may be inaccurate. Chawla (2012) states that this can be overcome by applying a longitudinal study. Future studies aimed at understanding connectedness-to-nature should apply a longitudinal approach, given appropriate funding and time allowances.

Finally, grounded theory is not meant to test existing theory but is better suited to theory development. However, grounded theory studies often evolve over time and deviate from the initial proposed research (Charmaz, 2014). This study included findings that were partially inconsistent with previous research on connectedness-to-nature (i.e. Mayer and Frantz, 2004). The connectedness-to-nature scale (Mayer and Frantz, 2004) was developed mainly with responses from university students, and was largely based on the readings of Leopold (1949). Those included in the development process of the connectedness-to-nature scale may not have been representative of a wider population, may have had biased opinions about what connectedness-to-nature is, and ultimately what factors to include in the connectedness-to-nature scale.

6.1 Areas for Future Research

1. Mentors proved to be important factors in the development of connectedness-to-nature. Future research should focus on understanding what type of mentorship is beneficial at

various stages in an individual's development.

2. This study required participants' to recollect memories of many decades ago. It is possible that memories are inaccurate. Future research could address this issue by applying a longitudinal approach.

3. Perceived ability was found to be an important factor in the expression of land conservation activities. Future research should compare differences in land management activity between participants who score high on the connectedness-to-nature scale, and those who score low on this scale when perceived ability is high (i.e. constraints removed).

4. Results were partially inconsistent with previous, qualitative approaches to measuring connectedness-to-nature. Future research should attempt to more closely capture individually held meanings of connectedness-to-nature, and explore the implications to the connectedness-to-nature scale as a measurement tool for connectedness-to-nature.

7.0 Conclusion

The current research project focused on exploring the role that connectedness-to-nature plays in private land conservation behaviour in Ontario, Canada. Results from this study may be useful to both researchers and conservation policy and program professionals alike.

First, this research examined what factors might lead to the development of connectedness-to-nature. The results support previous research, which found that unstructured, positive experiences in nature, and having a mentor may lead to pro-environmental behaviours later in life (Tanner, 1980; Chawla, 1999; Farmer et al. 2011). The current study found similar results, but applied them to the specific concept of connectedness-to-nature by comparing and contrasting landowners who scored high on the connectedness-to-nature scale, versus those who scored low.

Second, the current research explored the effect that connectedness-to-nature may have on both conservation attitudes and conservation behaviour. Landowners who scored higher on connectedness-to-nature scale tend to possess more biotic concern, and appreciation for the intrinsic value of land, while landowners who scored lower on the connectedness-to-nature scale tended to have a more utilitarian view of the land. This research did not find major differences between high and low scoring landowners in the expression of land conservation behaviours. Instead, perceived ability to act may play an important role,

limiting both high and low scoring landowners to passive conservation behaviour. However, the current study suggests that the conservation attitudes of high scoring landowners might make them more likely to engage in higher levels of conservation behaviour, if educational or technical barriers were removed. From a practical standpoint, landowners may require technical assistance and education to overcome a lack of knowledge about what land management activities are most beneficial. This result suggests an interesting direction for future research, which might explore whether or not differences in land conservation behaviours exist between high and low scoring landowners if constraints were removed, thereby affecting perceived ability.

Finally, a model that is grounded in the data was developed to offer insights into land conservation behaviour of Ontario landowners. Land conservation activities are types of pro-environmental behaviour that may be more difficult to engage in than other pro-environmental behaviours such as activism, recycling, or energy conservation. While other research has applied various social-psychological models on an individual basis, the current research found support for combining various aspects of connectedness-to-nature theory (Mayer and Frantz, 2004), values-beliefs-norms theory (Stern et al. 1999), and the theory of planned behaviour (Ajzen, 1991) to explain land conservation behaviour.

The first major component of the model developed as part of this study is the rural lifestyle decision, which is largely influenced by familiarity, sentiment, and personal preference. The rural lifestyle decision is important because it provides the requisite opportunity to engage in passive or active land conservation. Living a rural lifestyle leads landowners to

develop a connection to place-specific nature. Negative environmental changes in the form of built-form development poses a threat to the valued object, represented as place-specific nature. Landowners recognize the threat posed to nature, and have the ability to act by participating in active or passive conservation. Although passive conservation requires relatively little effort, an active land conservation approach requires more knowledge, money, and physicality. Therefore, the difference between passive and active land conservation is largely influenced by perceived technical, financial, and physical ability. Informed by landowner narratives, and supported by previous social-psychological (Schwartz, 1977; Ajzen, 1991, Stern et al. 1999) and connectedness-to-nature theory (Mayer and Frantz, 2004), the model can inform understanding of the development of conservation behaviour of non-farming rural landowners.

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Appendix A

Connectedness-to-nature Scale

1. I often feel a sense of oneness with the natural world around me
2. I think of the natural world as a community to which I belong.
3. I recognize and appreciate the intelligence of other living organisms.
4. I often feel disconnected from nature.
5. When I think of my life, I imagine myself to be part of a larger cyclical process of living.
6. I often feel a kinship with animals and plants.
7. I feel as though I belong to the Earth as equally as it belongs to me.
8. I have a deep understanding of how my actions affect the natural world.
9. I often feel a part of the web of life.
10. I feel that all inhabitants of Earth, human, and nonhuman, share a common “life force”.
11. Like a tree can be part of a forest, I feel embedded within the broader natural world.
12. When I think of my place on Earth, I consider myself to be a top member of a hierarchy that exists in nature.
13. I often feel like I am only a small part of the natural world around me, and that I am no more important than the grass on the ground or the birds in the trees.
14. My personal welfare is independent of the welfare of the natural world.

All questions are answered using a five-point Likert scale as follows:

- 1 – Strongly disagree
- 2 – Disagree
- 3 – Neither agree nor disagree
- 4 – Agree
- 5 – Strongly agree

Source: Mayer and Frantz, (2004)

Appendix B: Interview Questions

What experiences, events, or processes lead to the development of connectedness-to-nature among Ontario landowners?

Initial statement.

Thank you for taking the time to chat with me today. As indicated in the letter you received, I would like to talk to you about the MNR programs, but more importantly, I also want to talk about the underlying reasons about your conservation behaviour including information about yourself and your personal history. I want to assure you that all of the information provided will remain anonymous. There will be no personal identifiers included in any documents produced. When answering my questions, please keep in mind that this is not about what is right, wrong, or objective. It is not about me, it's all about your personal reality. It's about you and your story. I encourage you to speak freely, and not to say things just because you feel they are the right things to say.

Questions of interest

1. What is the context of this property/participant?
2. What motivations does this participant have to engage in conservation behaviours?
3. What does connectedness-to-nature mean to this person?
4. How do experiences throughout life shape this person's connectedness-to-nature?
5. What role do mentors play in fostering a feeling of connectedness? (How is CN increased/fostered)

Interview questions

1a. Please tell me about yourself, your property, your favourite aspects of this property?

- How do you manage certain features?
- How did you come about owning this piece of land?
- What are your experiences with the OMNR programs like?
- What do you like most/least about the programs?
- How long have you been enrolled in the programs?
- How much of an economic benefit do you gain?
- Is this a significant influence on your decision to participate?
- What suggestions do you have to improve the programs?

1b. What types of properties have you live on in the past?

- Which property was your least/most favourite and why?

2a. Do you consider yourself a steward of your property (caretaker)?

- Why do you take care of this property?
- What do you get gain by taking care of this property? What do you get out of it?
- Do you remember why you began to engage in conservation behaviours?

- Were other people in your life engaging in conservation behaviours?
- Who were these people and what kinds of conservation activities did they engage in?

3a. Do you feel a connection to nature? How do you view your interaction with nature?

- Where do you see yourself fitting in within nature? That is, where is your place in nature?
- Have you always thought this way?
- Were there any experiences that shaped the way you viewed nature?
- Did you have any good/bad events or memories?
- Did you see anything that shaped how you viewed nature?

3b. Do you think that the way you manage your land affects the wildlife and plantlife on this property? How?

- What conservation activities do you engage in? How did you choose these activities?
- Do you think your actions (or inactions) affect nature in general? How?
- Is there anything that made you decide to become a steward of the land?

4a. Take a few moments to think of your life as a story. Can you tell me how you liked to spend your time as a child? What did you enjoy doing? How did this change from when you were a small child to an adult?

- Were these activities structured?
- follow up with a interpreting statement (is it correct that....)
- perhaps a contrasting/comparison question. (how was activity X different between adolescent years and into adulthood)
- Where were your favourite places to do these activities?
- Did you spend the majority of your time in one type of place (city, forest, farm, other)? Was this by choice?

4b. Can you tell me about how you viewed nature when you were younger?

- What or where did you consider “nature” to be? Were you able to find your idea of nature wherever you went?
- Have your views of the nature changed over time while growing up? How so?
- Did you take nature for granted?

5. Can you tell me about your biggest mentors when you were growing up?

- What kind of activities did they like to do?
- What kind of influence did they have on you?
- What kinds of activities did you engage in with people in a mentorship role when you were younger (for instance, parents, teachers, family members, friends, siblings). Can you tell me about any memories with these mentors that stick out above the rest?

Closing questions to bring it back to a conversational tone

1. What do you have planned to get ready for the spring?
2. What kind of activities will you engage in over the summer, etc.
3. What kind of wildlife do you see on this property?