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Engaging with Nature:
A Participatory Study in the Promotion of Health

by

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Dedication

This dissertation work is dedicated to community citizens, practitioners, and decision-makers who unite to promote the health of people and the planet in enduring and everyday ways. It is also dedicated to my children who always restore my connections to health and nature with their abundant joy in the simple wonders of the natural world.

Abstract

Research evidence suggests that engaging with nature can promote health by reducing stress, improving cognition, fostering social connectivity, and supporting healthy behaviours such as physical activity, healthy eating, and pro-environmental practices. Yet there are empirical data gaps about how community members engage with nature in their local context, what facilitates or inhibits access to outdoor places , and how health practitioners and decision-makers use evidence on the linkages between health and nature to inform their work. Using a participatory, community-based research design and adapting photographic methods from the fields of ecological restoration and health care, this dissertation study addressed these critical gaps. The study was conducted in rural Nova Scotia, a site that offered considerable access to natural environments. In phase one, an aggregate group of parents with young children (n=8) participated in photo narration and photo elicitation interviews and focus groups to explore how they engage with nature to promote their individual and family health. In phase two, local practitioners and decision-makers (n=16) engaged in photo elicitation focus groups to discuss and expand the analytic themes from phase one and to examine how they use evidence on the health benefits of engaging with nature to design community-based health promotion interventions. Critical analytic themes emerged from the dialectical analysis of data from both phases and offered insight into the value of restorative places and experiences in nature, the barriers and facilitators to connecting with the natural world, the ties between engaging with nature and ecological citizenship, and the proposed shifts in practice and policy

norms and governance processes needed across sectors and citizen groups to simultaneously promote and protect the health of people and the natural world. The findings provided a unique view of ecologically-sound everyday access to restorative outdoor places as critical to the promotion of health. This paper-based dissertation details study findings and implications for research, practice, and policy through five manuscripts that together confer conceptual, evidence-informed, and analytic views of nature-based health promotion and provide insight into rigorous participatory photographic research methods for community engagement in mutual generation and exchange of knowledge.

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and health but encouraged me onwards during moments when I was tired and I did not know if I could do it. I still watch them so in-tuned and stirred by nature and am reminded daily of how important the natural environment is to their quality of life. These moments continue to inspire me to more critically understand the relationship between nature and health and to contribute to enduring change for the health of people and the planet.

Table of Contents

Tables

Figures

Appendices

Chapter One: Introduction and Overview

This dissertation details the conceptual underpinnings, methodology and methods, analytic findings, and implications of a community-based study that used photographic methods to examine nature-based health promotion with a group of citizens, practitioners, and decision-makers from a rural community in Nova Scotia. The findings provide potential direction for community citizens, health practitioners, and decision-makers in realizing engagement with nature in daily life, practice, and policy.

For purposes of this dissertation research, nature is defined as outdoor natural ecosystems such as gardens, green space, waterways, and woodlands, found in local contexts (Maller et al., 2008). Nature-based health promotion is the process of generating health by strengthening access to everyday activities and conditions that connect people with the natural world (Hansen-Ketchum et al., 2009). The dissertation study drew on a unique and expanding view of health that ventures beyond disease to account for the conditions and processes that promote healthy living for people and the planet. Nature-based health promotion is built on a proactive, strengths-based perspective of health promotion and environmental health. It involves addressing the complex system of individual, organizational, community, and policy influences that characterize the opportunities and challenges for enabling access to nature and promoting health in local contexts.

The dissertation is structured according to guidelines for the paper format option outlined by the University of Alberta Faculty of Graduate Studies and Research. The dissertation begins with an introductory chapter and is followed by five chapters in paper format. A seventh and final chapter concludes the report.

Hence, chapters two through six are comprised of five manuscripts featuring an a-priori conceptual model published in the *Journal of Advanced Nursing*, an integrative literature review published in *Health Promotion International*, a methods paper prepared for *Qualitative Health Research*, and two manuscripts on study findings, one in-press with the *University of British Columbia Press* and the other recently revised for *Health and Place*. The combined findings from these papers confirm that nature can provide conditions for simple yet profound and enriching experiences that are good for people and the planet. Taken together, the papers depict the need for citizens and researchers, practitioners, and decision-makers across sectors to shift norms and processes toward collaborative efforts that can promote and protect the health of people and the world by creating equitable and ecologically-sound access to nature in local contexts.

This introductory chapter begins with a brief background on the topic of nature-based health promotion and then provides an overview of the study methodology and methods. Further details on the conceptual framework, literature review, methods, and findings are provided in the dissertation papers. A final section of this chapter provides an overview of the five dissertation papers as segue into subsequent chapters.

1.01 Background

Theoretical and research literature across fields provide evidence to substantiate the health promoting benefits of interacting with nature (Dunkley, 2009; Ewert et al., 2005; Berger & MacLeod, 2006; Burns, 1998; Hartig et al., 2001; Kingsley & Townsend, 2006; Kuo, 2001; Kuo & Sullivan, 2001; Lundgren,

2004; Milligan et al., 2004; Wakefield & McMullan, 2005; Wells, 2000; Williams, 1999; Wilson, 2003; Ulrich, 1984). Spending time in nature has also been shown to increase the likelihood of being active, eating well, and adopting pro-environmental behaviours for the health of the planet (Ewert et al., 2005; Carrus, Passafaro, & Bonnes, 2008; Hartig, Kasier, & Bowler, 2001). Pro-environmental behaviours like walking instead of driving are actions that can have a positive impact on natural ecosystems (Groot & Steg, 2009; Stern, 2000). Other research (Collins & Kearns, 2007; Milligan, 2007; Milligan & Bingley, 2007) helps to challenge presumed benefits of being in natural environments by pointing to potential risks and perceived fears that can be associated with these places (Taylor et al., 2001; Wells, 2000).

The research evidence on the value of engaging with nature as a resource for health, in balance with the risks and fears of being in nature and the barriers and facilitators to accessing natural places, can together inform and potentially strengthen current work in public health. Yet, scholars such as Orr (1992, 2004), Kahn (1999), Kellert (1993) and Wilson (1984) contend that health and well-being remains impoverished in a modern world consumed by technological and economic progress that provides increasingly limited opportunities to directly connect with the natural world in health promoting ways. Moreover, little is known about experiences in nature in local communities or about the facilitators and challenges to equitable access to these experiences. Furthermore, there is limited research on how health practitioners and decision-makers use research on the benefits of engaging with nature to inform their work.

Current views of health promotion draw the connections between people and their physical and socio-cultural contexts (Kreiger, 2001; McLeroy et al., 1988; Sallis & Owen, 1997; Smith, Tang, & Nutbeam, 2006; Stokols, 1996). Nature-based health promotion, then, is not limited to education and lifestyle change, but should involve critically analyzing, implementing, and evaluating strategies that address the human-environment reciprocity at the individual, interpersonal, organizational, community, and policy levels. Furthermore, similar to human health, nature is sustained or degraded by the type and quality of inter-relationships between people and the world they share. By engaging with nature, people can both promote their own health and simultaneously develop sensibilities to motivate practices that are just for people and the environment (Ewert et al., 2005; Carrus, Passafaro, & Bonnes, 2008; Hartig, Kasier, & Bowler, 2001). Nature-based health promotion involves developing ecological sensibilities that can potentially help researchers, together with communities of citizens, practitioners, and decision-makers, promote health for all. Yet, despite mounting evidence from the biological and behavioral sciences that engaging with nature has direct and long term benefits for human health and the health of the environment, proactive and long term thinking about the links between human and ecosystem health remain on the fringe in health systems and society at large.

Based on a critical appraisal of the literature (Chapter 2), knowledge gaps remain in the following areas: 1) narrative accounts and experiential perspectives about engaging with nature in local contexts and community settings, particularly in rural areas; 2) citizens' perceptions of the barriers and contributors to engaging

with nature within their communities; 3) perspectives of health practitioners and policy-makers on nature-based health promotion; 4) the socio-ecological complexities of engaging with nature in the promotion of health; 5) nature-based interventions in community contexts; and 6) nature-based interventions used in conjunction with other health promotion and/or ecological initiatives (e.g. healthy eating and active living programs, creation of green spaces). Using a participatory community-based research approach, this dissertation study addresses gaps one through four and generates knowledge for future work on gaps five and six. The study demonstrates that bringing people together in creative ways to explore the significance of nature-based health promotion in local contexts can bring it to the forefront of thinking across sectors.

1.02 Research Purpose and Questions

The purpose of this research was to generate knowledge about engagement with nature in the promotion of health. Specifically, I pursued the following research questions:

1) How do parents of young children care for and engage with nature to promote their individual and family health?

Sub-questions:

a) What are parents' perceptions of the relationship between nature and their own and their families' health?

b) What are parents' experiences of engaging with nature in their community?

c) What do parents perceive as barriers and enablers to caring for and engaging with nature?

d) What do parents perceive needs to be done to remove barriers and improve opportunities for engaging with nature in their community?

2) How do health practitioners and decision-makers use evidence on the health benefits of engaging with nature to design community-based health promotion interventions?

Sub-questions:

a) What do health practitioners and policy-makers understand about the relationship between nature and the promotion of health?

b) What do practitioners and policy-makers perceive as the supports, challenges and opportunities for designing and implementing health promotion interventions that enable engagement with nature?

1.03 Research Design

The study design and methodology was rooted in a critical realist view of research, layered with socio-ecological thinking and ideals from the field of ecological restoration. Critical realism, embedded in the work of Dunning (1997), Habermas (1984), Israel et al. (1998), McEvoy and Richards (2006), Morrow and Brown (1994), Proctor (1998) and Thompson (1995) helped to situate knowledge and truths at the intersection of multiple perspectives, as shaped by social, political, cultural, physical, political, cultural, physical, and economic contexts. Further, socio-ecological thinking enabled me to consider and examine the individual, family, community, and system level determinants of and influences

on experiences (Edwards, Mills, & Kothari, 2004; McLeroy et al.,1988; McMurray, 2007; Stokols, 1996;). Insights from the field of ecological restoration (Higgs 2003, 2005, Mills, 1995) and from a restorative approach to research in health care (Marck et al., 2006a, 2006b, 2008; Marck, in press) provided theoretical, scientific, and practical justification for attending to and examining the reciprocity between people and their natural environment. A restorative approach guided me in designing and implementing photographic methods in ways that engaged people with their shared local places and with each other and enabled us to collectively examine nature-based health promotion. Hence, an integrative methodology supported me in comparing and contrasting variant perspectives to account for the complexities, barriers, and facilitators to engaging with nature. For instance, experiences in nature were influenced by multiple factors (e.g. individual values, previous life experiences, access to green spaces) and also impacted health in various health-promoting ways (e.g. reduced feelings of stress, enriched family relationships, and encouraged pro-environmental behaviours). In turn, nature-based health promotion crossed and connected many sectors (e.g. nursing, public health, community health, recreation, transportation, education, and community/urban planning). The methodology provided the theoretical guidance needed to explore and examine these complexities. For more details on the methodology and methods used, please refer to chapter four, dissertation paper three.

I conducted the study in an Atlantic Canada town and county of about 5000 families. It offered a rural setting with considerable potential access to

natural environments. The research consisted of two phases. In Phase 1, I used photo narration and photo elicitation in interviews and focus groups with parents of young children to gather data on how they cared for and engaged with nature to promote their individual and family health and the opportunities and challenges to this process. The outdoor context fostered an experiential connectivity among participants to the natural environment they shared. In Phase 2, I used photo elicitation in focus groups with local health practitioners and decision-makers to explore how they used evidence on the health benefits of engaging with nature to design community-based health promotion interventions, and their perceptions of the barriers and opportunities for nature-based health promotion within the community. I used dialectical analysis to critically examine the data for themes, comparing and contrasting for areas of convergence and divergence among participant perspectives and the literature.

1.04 Phase 1 sample and recruitment. The selection of Phase 1 participants was purposive (Huberman & Miles, 1994; Maxwell, 2005). Based on the sample size of studies using similar methods (Berlin, 2005; Frith & Harcourt, 2007; Lockett, Willis, & Edwards, 2005), I recruited eight parents. I sampled until repetition occurred in the codes and a very robust theoretical description of the parents' perspectives was evident. I chose parents of young children because they were an aggregate group of community citizens considered gatekeepers through which **"**society transmits to individuals its social norms, roles and responsibilities" (McMurray, 2007, p. 108). Parents' values and lifestyle practices can influence their own and their family's health and also have an impact on the health of the

environment in which they live (McMurray, 2007). Their practices in nature can also help nurture (or not) their own decisions and those of their children.

Parents who agreed to participate in the study had varying experiences in nature and had interest in the topic. The eligibility to participate in Phase 1 included the following criteria:

1) Participants were able to read, write and speak fluent English. The majority of residents in the town and county are English-speaking;

2) Participants were living in the town or county for at least 2 years to ensure that they have some experience with community-based activities;

3) Participants were parents of at least one child between the ages of 1-4 years;

4) Participants had either a) experience engaging with nature within their community or b) had an interest in engaging with nature in the community. It was assumed that those who responded to the invitation to participate had an interest in the topic.

Criteria 3 was intended to facilitate some consistency among parents in terms of contact with the health system and use of community resources. I stipulated an age range of 1-4 years for the children for two main reasons: a) funded maternity and/or paternity leaves are usually finished within one year and so parents who work outside the home likely would be back to work and therefore more apt to provide insight into their experiences in the community - experiences that take place during, before or after work; and b) faced with family and work-related demands, health promotion is critical to the well-being of these parents and they

are also likely to have similar formal contact with the health system through child health clinics, resource centers, and other potential settings for health promotion. After age four, children begin school and parents may have less contact with community-based centres such as day cares, drop-in centres, and screening clinics, where they could be in regular contact with health practitioners.

Only one parent per family participated in the study to avoid multiple data sets from the same family and to obtain greater diversity and variation of experiences for examination and comparison (Maxwell, 2005). I aimed to have a diverse group of parents (age, employment, male/female), not for purposes of generalizability but rather for the multiple perspectives needed to understand engagement with nature and the barriers and facilitators to same. I initially targeted day cares and local family-centred resource centres used by parents with varied demographics in terms of age, employment, income, and life experiences. I conducted information sessions with staff and parents in these locations to explain the research and provide them with the study posters (see Appendix A). I also placed the study poster on community bulletin boards at locations around the community such as the local library, community centres, farmer's market, local bakeries and grocery stores, as well as on community listserves.

General demographic data across participants is outlined in Table 1.1 (refer to the next page) to preserve confidentiality of participant information within a small rural community.

Table 1.1
Demographic Data for Phase 1 Sample

N	**Age**	**Gender**	**Number & age of children**	**Employment status**	**General location of home and workplace**
N=8	31-43 yrs	N=2 males N=6 females	Average = 2 children per participant Ages of children ranged from 1 year – 4 years with several having siblings aged 5-6 yrs	N=6 full time employment N=2 part time employment	N=3 lived and worked in town N=1 lived in county and worked at home N=4 lived in county and worked in town

1.05 Phase 2 sample and recruitment. In keeping with sample sizes used by researchers employing similar methods (Berlin, 2005; Frith & Harcourt, 2007; Lockett et al., 2005), I recruited 16 local practitioners and decision-makers in Phase 2. Decisions about who to select for Phase 2 were driven by findings and recommendations from parents in the first phase of the study. Refer to Appendix B for the decision-making matrix used to match Phase 1 findings to applicable sectors and citizen groups. The diverse Phase 2 sample enabled a breadth of perspectives to inform and expand the evolving themes. To recruit Phase 2 participants, I circulated a poster of invitation (Appendix C) and study information to the work location of potential participants. In the end, Phase 2 participants included public health nurses, representatives from the Departments of Community Health and Community Services, educators of undergraduate education students involved in the public school system, staff and directors of local day care centres, members of advocacy groups, and others involved in recreation and community and sustainability planning.

1.06 Phase 1 data collection. In Phase 1, I used photo narration and photo elicitation in the following ways: 1) participant-led photo narration; 2) semi structured interviews using photo elicitation; and 3) photo-elicitation via focus groups. Photographic protocols as well as interview and focus group guidelines were used and revised carefully throughout data collection. For instance, interview and focus group questions were added or changed based on on-going analysis and feedback from participants. This enabled me to probe for clarification and expand the analytic themes. Refer to Appendices D-J for the original and revised photographic protocols and interview and focus group guidelines. Revisions to the original versions are depicted in capital font. These revisions were the result of on-going researcher reflections as well as supervisory collaboration and feedback. Refer to Appendix K for excerpts from my research journals as examples of my on-going decision-making processes. Appendix L provides an example of a progress report to the supervisory committee and depicts the collective processes we upheld to discuss and debate on-going data collection and analysis decisions.

Using the 'Photographic Protocol for the Researcher' and associated procedural tracking charts (see Appendix D) I met individually with each parent who agreed to participate and explained the details of the study, answered any questions and obtain informed consent (Appendix M). Adapting protocols of successful studies by Lockett et al., (2005), Stedman et al. (2004) and Berlin (2005), I gave parents disposable (recyclable) cameras and asked that they take pictures and reflect on their engagement with nature and the barriers and

facilitators of the same. Similar to Clark-Ibanez (2004), Moffit and Robinson Vollman (2004), Lockett et al. (2005), and Wang and Burris (1997), I asked participants to take pictures that captured their diverse experiences over a period of two weeks. I also provided parents with a photo log and encouraged them to immediately record when and where each photograph was taken and what each image meant to them (see Appendix E & N). They were also given the option to use a digital recorder to log these reflections. Only one participant chose to use this option. After one week, I called participants to check-in on their progress with their cameras and their logs. None of the participants had any difficulties with the process, but all expressed their appreciation for the reminder. After two weeks I picked up the participants' cameras and their logs and then made two copies of the photos; one hard copy I returned to them and the other I retained for analysis.

After the pictures and logs were collected and analyzed, I met with each parent to verbally review their photos with them while probing further about their experiences of engaging with nature to promote health. These semi-structured photo elicitation interviews with parents took place in a mutually agreed upon location, some preferred their home and others preferred a meeting room at the local university. The interviews were approximately 60-90 minutes in length and were digitally recorded and transcribed. At the end of the interview, participants were asked to select 2-3 pictures that best reflected two or more of the following elements: a) engagement with nature in their community; b) the evident barriers; and/or c) the opportunities for and contributors to their engagement. Where

participants agreed, select photos were then chosen for subsequent use during Phase 1 photo elicitation focus groups with groups of parents as well as Phase 2 photo elicitation focus groups with practitioners and policy-makers.

After the individual photo elicitation interviews were conducted and analyzed, parents were asked to participate in a 90 minute photo elicitation focus group with the other parent participants to: 1) collectively discuss the barriers and contributors to engaging with nature in their communities; 2) share and discuss their selected photos to confirm, disconfirm and refine emergent themes and their linkages; 3) discuss possibilities for community-based strategies to facilitate engagement with nature to promote health; and 4) discuss criteria for selecting practitioners and policy-makers for the next phase of the research. Five of the eight parents participated in one of two focus groups. Verbal consent was obtained prior to the start of the focus group for the discussion to be recorded. Previously selected pictures were projected onto a screen for discussion. Focus groups were held in a private location at the local university.

1.07 Phase 2 data collection. In Phase 2, I conducted photo elicitation focus groups with health practitioners and decision-makers. Themes and select photos from the parents' data were shared and discussed with a sample of 16 practitioners and decision-makers who participated in one of two focus groups with each session lasting approximately 90 minutes. Each participant was involved in only one focus group to avoid the positioning for power that can happen in groups over time (Cote-Arsenault & Morrison-Beedy, 2005) and to gather additional perspectives on practice and policy to build on Phase 1 themes.

Several days prior to each focus group, a concise description of the themes from Phase 1, coupled with associated reflection questions, was circulated to participants (Appendix O). This helped to prepare participants ahead of time for focused discussions. At the start of each focus group session, the study information was discussed, questions answered and informed consent obtained (see Appendix P). The discussions were recorded for later transcription. Select pictures were projected onto a screen for discussion. The focus groups enabled participants to examine: 1) engagement with nature in the promotion of health; 2) current and potential use of evidence on the health benefits (for people and the environment) of engaging with nature to inform their work; and 3) the barriers and contributors to designing and implementing health promotion interventions that enable ecologically sound sustainable ways of engaging with nature.

Once both phases of data collection and preliminary analysis were complete, I circulated a final summary of the analytic themes to parents from Phase 1 and to practitioners and decision-makers from Phase 2 who had previously agreed to offer their final feedback and suggestions. Eleven participants submitted final written feedback. Please refer to Appendix Q for the final summary of themes and questions and Appendix R for participant feedback on this final summary.

1.08 Data Analysis: Overview of Phase 1 and 2

In this section, I identify the overarching data analysis processes that were common to Phase 1 and 2. Please see chapter four, dissertation paper 3, for further specifics on my analytic processes. In brief, drawing on the work of Dunning

(1997) and Thompson (1995), I used dialectical analysis during both phases to examine multiple perspectives and identify the tensions and contradictions that characterized the data. For Thompson (1995), dialectical analysis is the "dialectic of interpretation" (p. 51) which "must be developed in a way which unfolds the connections with the constitution of the subject on the one hand and the constitution of the social world on the other" (p. 215). In this study, dialectical analysis involved putting the codes and themes from the data into dialogue with each other and with a priori theory to generate new knowledge. Each new primary document added to Atlas.ti (e.g. participant logs, photographs, interview transcripts, focus group transcripts) was coded, contrasted, compared, and linked to any previous codes from earlier data as needed (refer to Appendix S for an overview of the analytic procedure for the written and visual data). A priori theory was questioned and extended as the data were analyzed.

Codes were categorized according to primary substantive and secondary theoretical levels of abstraction (Maxwell, 2005). Substantive codes were the first line of codes that linked directly to participant quotations. The development of secondary theoretical codes combined patterns in the data and helped to collapse the codes over time. A total of 52 analytic codes informed the development of five final analytic themes (see Appendix T for the code list). Examples of codes and memos are included in dissertation paper 3 (Chapter 4). The Atlas.ti hermeneutic unit was developed with the addition and analysis of 154 primary documents consisting of photo narrations and interview and focus group transcripts. As analysis progressed, textual data and photographs were examined,

coded, and linked to other codes. Memoing was used throughout this process to question for patterns of convergence and opposition and to examine the relationships among substantive and theoretical codes and the literature (Bringer, Halley Johnson, & Brackenridge, 2006; Lewins & Silver, 2007). For specific steps of data analysis, please refer to Appendix S and dissertation paper 3 (Chapter 4).

1.09 Rigor

Rigor in qualitative research has been defined as the iterative self-corrective process of verifying congruency between design and implementation and validating the findings (Morse, Barret, Mayan, Olson, & Spiers, 2002). This conception of rigor suggests that criteria to evaluate rigor should 'fit' with the epistemological underpinnings of a particular study (Cowling, 1986; Freeman, 2006; Hansen-Ketchum & Myrick, 2008; Koch, 1998; Madill, Jordan & Shirley, 2000; Morgan, 1983). Hence, Bradbury and Reason's (2003) and Maxwell's (2005) criteria for rigor in participatory research were used as guide posts for the study. These criteria were: quality as plurality of knowing and as relational praxis; quality as a reflexive or practical outcome; and quality as engaging in significant work and enduring consequence. Each of these theoretical constructs provided "choice points" for specific strategies that I adapted from Maxwell (2005), Huberman and Miles (1994), Tobin and Begely (2004) and Sparkes (2001) to ensure that I conducted the study as designed and that the findings were trustworthy. These strategies helped me test and strengthen the validity of my findings with participants.

1.10 Quality as plurality of knowing and as relational praxis. The participatory processes in this study were intended to enable theory building that was rooted in the experiences of community members (Bradbury & Reason, 2003). The active and on-going participation of participants in the development and refinement of knowledge occurred through reflective cycles of dialogue, data analysis, and confirmation, disconfirmation and expansion of themes. Deductive and inductive processes were used to enable a critical dialectical cycle between theory and experience and back again. This cycle is designed to account for the theoretical and empirical processes of data collection and analysis, recognizing that neither one is sufficient on its own (Thompson, 1995).

More specifically, the following related strategies were used:

1) Multiple forms of data collection compensated for the validity threats which are inevitable in any method (Maxwell, 2005, Tobin & Begley, 2004). The multiple perspectives from a diverse group of parents, health practitioners and decision- makers, accrued in diverse ways (e.g. photo narration, photo elicitation, interviews, focus groups), helped illuminate the complexities of engaging with nature to promote health.
2) Iterative on-going feedback from participants was sought throughout data collection and analysis. In Phase 1, the interviews helped me examine and validate my interpretations of the participants' photographic logs. The focus groups then helped validate the interview themes and gather additional data. In Phase 2, the focus group participants assisted in expanding the themes from Phase 1 and offered

new data on practice and policy. Participant feedback on the written summary of the themes also helped confirm the final analytic themes. These on-going feedback loops with participants help establish the credibility and usability of the findings (Bradbury & Reason, 2003; Burgess, 2006; Israel et al., 1998).

3) Protocols were used to ensure rigor and consistency in implementation of the study and were revised to better probe and question the data, based on researcher reflections, emergent analytic themes, and feedback from participants. Refer to appendices D-J for examples of original and revised protocols.

1.11 Quality as reflexive or practical outcome. Israel et al. (1998) contend that community-based approaches are needed to develop knowledge that is usable in practice and meaningful to the everyday lives of participants. Koch (1998) further argues that studies should be evaluated, in part, on the basis of reflexivity, the degree to which the researcher self-critiques, self-appraises and provides rationale for research activities. Thus, in addition to strategies outlined previously, and to ensure a reflexive and practical outcome, I employed the following strategies:

1) On-going involvement with participants enabled iterative critical reflections on the data and analytic themes and prevented premature theorizing that can occur from a superficial understanding of participants' experiences (Maxwell, 2005; Huberman & Miles, 1994). In Phase 1, after analyzing each photo narration, I conducted in-depth

semi-structured photo elicitation interviews with each parent and then facilitated photo elicitation focus groups with these same participants. In Phase 2, I conducted focus groups with practitioners and decisions-makers to expand the data and analysis even further. Together, these on-going opportunities with participants enabled us to question the data, reflect on and strengthen preliminary themes, and to ensure the findings were relevant to participants, practice, and policy.

2) During each interview and focus group, participants were asked for feedback on the methods in efforts to continually refine and improve my approach throughout the study.
3) Handwritten reflective journaling and memoing in Atlas.ti stimulated my analytic thinking, helped me document the analysis process, and enabled me to adjust my approach and revise my interview and focus group questions as needed. Together with the data collection and analysis protocols and use of atlas.ti, these mechanisms helped create the project audit trail. My journals and memos were not used as data, but instead were used to document and facilitate my ongoing approach to data collection, data analysis and knowledge exchange.

1.12 Quality as emerging significant work and enduring consequence.

Cornwall & Jewkes (1995) assert that because community-based studies are based in the experiences of community members, the participatory approach lends itself to being meaningful for people while also building capacity for change within the community. The following are additional examples of strategies that helped

ensure the validity of the design and findings as significant work and enduring consequence:

1) I continuously questioned: Am I searching for discrepant cases? As I analyzed the data and examined my theorizing with participants, I questioned supporting and discrepant data.
2) By using participatory research methods, I helped generate ongoing opportunities for mutual exchange of knowledge between the researcher and participants as data collection and data analysis proceeded and findings emerged. For instance, the photo narrations, photo elicitation interviews and photo elicitation focus groups enabled participants to share experiences and perspectives, examine emergent analytic themes, and offer feedback and recommendations. Participant involvement in the analysis and interpretation of the data verified the authenticity and relevancy of the findings to practice and policy.
3) Limiting power imbalances and providing participants with ample opportunity to share their views was encouraged by the two phase and multi-method (e.g. photo narration and photo elicitation) research design. The two separate samples, one of parents and the other of health practitioners and decision-makers, fostered open and relevant (to individual participants) data and helped maximize participant use of time and contributions while minimizing power imbalances that can hinder participant involvement.

Theoretical criteria for rigor were identified at the outset of the study as plurality of knowing and relational praxis, quality as reflexive or practical outcome, and quality as engaging in significant work and enduring consequence (Bradbury & Reason, 2003; Maxwell, 2005). These theoretical markers were used to guide specific strategies for rigor described above. The identified strategies, adapted from the work of Maxwell (2005), Huberman and Miles (1994), Tobin and Begely (2004) and Sparkes (2001), guided me in implementing the study as designed, using rigorous processes to help ensure the methods and findings were theoretically, scientifically, and practically sound.

1.13 Ethical Issues

The dissertation study was approved by the Health Research Ethics Boards of the University of Alberta, Edmonton, Alberta and the Guysborough Antigonish Strait Authority (GASHA) Research Ethics Review Committee. As approved, the following ethical considerations were accounted for in my research:

1) Informed and on-going consent: Written and informed consent was obtained prior to data collection with participants.
2) Voluntary participation: The letter of information and consent form specified that participation was voluntary. This was reinforced during verbal communications with participants.
3) Photographs: Participants were encouraged to avoid taking photographs of identifiable people. Several participants included family members in the photographs and gave signed written consent to

use select images in focus group and future publications (see the Information and Consent Form for Photographees, Appendix U).

4) Thank you gifts for participants: All participants were given $10.00 worth of Farmer's Market money at the beginning of each stage of data collection. For instance, I gave participants a thank you card (with enclosed money) at the end of each individual interview and focus group discussion with parents, health practitioners and decision-makers. Participants then used these dollars to buy produce, baked goods, or crafts at the local Farmer's Market. Parent participants were also given copies of their photographs.
5) Confidentiality: I discussed with participants that anonymity was not possible in the group discussions. However, I assured them that their names and identifying information would not be used in the transcripts, descriptions of the findings, reports, or publications. I had the research transcriptionist (Appendix V) sign a confidentiality agreement. I discussed with participants that only I and my supervisors had access to the audio recordings and transcripts. All study documents and data were locked in a filing cabinet in my home and/or work office.
6) Security of files: I stored my data on a secure server with back up copies saved to USB flash drives. Data saved on the server and flash drives was encrypted and password protected.

1.14 Limitations

When considering a purposive sampling strategy, I debated the pros and cons of potential eligibility criteria for participants and, for reasons previously delineated, decided to include an aggregate group of parents of young children in Phase 1. In doing so, I realized that I was excluding the childless, parents of older children, adolescents, elderly people, and those who were not literate in English (oral and written), among others.

Although recruitment strategies targeted participants with diverse incomes and education, the final sample turned out to be a relatively homogenous middle class group. As such, the relevancy of the findings to people of lower incomes or disadvantaged groups is uncertain. I also realized that those most interested in nature and health would agree to participate. People who were not interested in engaging with nature did not participate in the study, so data on the barriers to connecting with nature from these individuals were not acquired. In the end, those who participated in the study came with bias toward the value of engaging with nature and resided in a rural area where crime and fear of nature was relatively uncommon. From a critical perspective, I acknowledge that this bias limited data on the negative aspects of engaging with nature, including the risks and fears associated with some places.

I also intentionally focused on the experiences of individual parents in Phase 1 and did not include their spouses or children in the data collection processes. While this allowed me to focus on depth of experience for individuals, as a consequence, I did not obtain family-level data in Phase 1. Rather, for the

purposes of this study, I selected a sub-group of the community in Phase 1, including participants with similar characteristics such as family and work demands, family developmental stage, and shared community places, aiming for depth of data rather than breadth, and focusing on issues and contexts most likely relevant to all of them. In Phase 2, a more heterogeneous group was selected to adequately examine the issues that crossed sectors and programs described by parents in Phase 1. Future studies will build from these limitations.

1.15 Dissertation papers

Five published, in-press, and publishable papers comprise this dissertation. The first paper was published in the *Journal of Advanced Nursing* and begins the dissertation by framing a conceptual model for nature-based health promotion that provided foundational direction for this research study. The paper offers an innovative and complex view of theoretical perspectives and research findings that situate the study problem, research questions, and design into a new and evolving framework that merges health promotion and environmental health and offers proactive recommendations for advancing research in this area. It provides justification and rationale for this current study as well as future research endeavors.

The second paper, published in *Health Promotion International*, provides an integrative review of research findings from diverse fields that consolidates insight into the health benefits of engaging with nature as well as the gaps in knowledge that informed this dissertation study. The manuscript offers a socio-ecological critique of research that crosses fields of nursing, public health, health

promotion, medicine, biological sciences, environmental sciences, recreation and leisure, psychology, social sciences, health geography, and urban planning.

The third paper focuses on the methodology and methods that I used in the study. It provides methodological rationale for my data collection and analytic strategies and provides examples of codes and memos, alongside quotes and feedback from participants. It provides insight and justification for the study design and implementation, including the rigorous and participatory processes used to develop critical knowledge relevant and useful to community citizens and to practice and policy. It is currently in the final stages of revision for submission to Q*ualitative Health Research*.

The fourth manuscript presents findings from Phase 1 of the study and is a chapter in-press with the *University British Columbia Press*. Dr. Lars Hallstrom, currently Director for the Alberta Centre for Sustainable Rural Communities University of Alberta, is the editor of the volume. The chapter provides insight into key analytic themes from parents' experiences and perspectives of engaging with nature in their local community. The manuscript raises critical questions about restorative experiences and places in nature, in concert with ecological citizenship, all the while drawing connections to a notion of ecologically emancipated communities. A view of ecologically emancipated communities is the underlying theme patterned throughout Hallstrom's volume.

The fifth paper describes the final analytic themes but focuses particular attention on the notion of strengthening access to restorative places through practice and policy norms and inter-sectoral governance, themes derived from

analysis of Phase 2 data. It has been revised for *Health and Place*. The paper provides critical perspectives about the barriers and opportunities for equitable and community-based access to nature. It also advocates for health promotion research, practice, and policy across sectors such as health, education, community-planning, transportation, and citizen groups, for the design, implementation, and evaluation of diverse and inclusive strategies that enable access to health promoting places. A list of the dissertation papers and corresponding abstracts are below.

1) Conceptual model paper:

Hansen-Ketchum, P., & Marck, P., Reutter, L. (2009). Engaging with nature to promote health: New directions for nursing research. *Journal of Advanced Nursing, 65*(7), 1527-1538.

Abstract

Title. Engaging with nature to promote health: new directions for nursing research.

Aim. The aim of this paper is to offer a conceptual framework for nature-based health promotion in nursing and provide related recommendations for future nursing research.

Background. Empirical data suggest that interaction with nature has direct health benefits. When people attend to outdoor habitats, gardens and other forms of nature, they are more likely to engage in physical activity and other behaviours that improve health. Engaging with nature can even cultivate ecological sensibilities that motivate us to protect the health of our planet.

Data sources. Multidisciplinary theoretical and research publications from 1985 to 2008 were examined in the development of the framework.

Discussion. As the health of our planet continues to deteriorate, there is a pressing need for theoretically informed, ethical, sustainable ways of engaging with nature to promote human and environmental health. We adapt principles and socioecological thinking from the fields of nursing, health promotion and ecological restoration to delineate the essential elements of the proposed framework.

Implications for nursing. Although evidence-based knowledge about nature-based health promotion is not readily used in nursing and health care, its development and application are critical to designing effective strategies to strengthen both human and environmental health.

Conclusion. Nurses can use nature-based health promotion concepts to work with citizens, health practitioners and policymakers to explore and optimize reciprocal, health promoting relationships among humans and the natural environment. To the extent that nurses integrate nature-based health promotion into their research efforts, we can expect to contribute meaningfully to both environmental and human health in communities across the globe.

Keywords: conceptual framework, ecological restoration, environmental health, health promotion, nursing, whole systems

2) Literature review paper:

Hansen-Ketchum, P. & Halpenny, E. (2010) Engaging with nature to promote health: Bridging research silos to examine the evidence. *Health Promotion International.* Advance Access Aug. 26, 2010. doi: 10.1093/heapro/daq053

Abstract

While there is considerable research on environmental contamination and degradation, there is equally credible evidence on the healthful qualities of the environment. Being in and caring for nature can be health promoting for individuals, families, communities, ecosystems, and the planet. In this paper, we use a conceptual model for nature-based health promotion and a socio ecological model of health promotion to guide the scope, organization, and critique of relevant literature on nature-based health promotion in several fields and generate recommendations for practice, policy, and research. We conclude that participatory community-based research is needed to build local knowledge and create systemic change in practice and policy to support healthy living for people and the planet.

3) Methods paper:

Hansen-Ketchum. P. & Marck, P. (for submission Fall 2010). Linking methodology and methods: Insights from a participatory community-based photographic study of nature-based health promotion in rural Nova Scotia. For submission to *Qualitative Health Research*

Abstract

It matters what methodological perspectives inform our research methods. Methodological assumptions act as theoretical check points that substantiate our research decisions and foster rigor and consistency in the

design and implementation of a study. In this article we detail the methodological assumptions guiding a study using photo narration and photo elicitation to demonstrate how our suppositions have influenced our research decisions and approach to data collection and analysis. In this study, data collection and analysis is rooted in assumptions of critical realism, socio-ecological thinking, and the field of ecological restoration.

4) Findings paper:

Hansen-Ketchum, P. (in-press) Engaging with nature in the promotion of health: A cornerstone to ecologically emancipated communities. In L. Hallstrom's (Ed.) ***Environment, Health and Community Development*****. Vancouver, British Columbia: UBC Press.**

Abstract

In this chapter I use findings from a community-based participatory study on engaging with nature in the promotion of health to describe critical linkages to three fundamental elements of ecologically emancipated communities: 1) equitable access to restorative outdoor places; 2) opportunities for ecological citizenship; and 3) communal efforts for change. I argue that evidence on restorative natural places, restorative experiences in nature, everyday access to nature, and ecological citizenship, together add vital insight into a new inclusive vision of ecological emancipated communities.

5) Findings paper:

Hansen-Ketchum, P., Marck, P., Reutter, L., & Halpenny, E. (submitted for review 28 May 2010, reviewer comments received 30July2010, revisions completed 8 September 2010). Strengthening access to restorative places: Findings from a participatory study on engaging with nature in the promotion of health. *Health and Place.*

Abstract

In this paper we examine research findings from a community-based study on engaging with nature in the promotion of health. Photographic research methods combined with an iterative process of dialectical analysis enabled us to examine the experiences and perspectives of community citizens, practitioners and decision- makers from various sectors to better understand the complexities of connecting with natural outdoor places in local contexts. Data provide valuable insight into the barriers and opportunities for ecologically-sound everyday access to restorative outdoor places and ecological citizenship. Collaboration across sectors such as health, education, community-planning, transportation, and agriculture, commensurate with active citizen engagement in on-going research, decision-making, and action, is essential to the development of strategies that foster ethical communal norms and that support progress toward diverse integrative ways of promoting the health of people and shared restorative places.

The five dissertation manuscripts are presented sequentially in the chapters that follow.

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Chapter Two: Engaging with Nature to Promote Health
New Directions for Nursing Research

A version of this chapter has been published. Hansen-Ketchum, P., & Marck, P., Reutter, L. (2009). Engaging with nature to promote health: New directions for nursing research. *Journal of Advanced Nursing, 65*(7), 1527-1538.

2.01 Introduction

There is growing evidence that interacting with outdoor habitats, gardens and other forms of nature promotes human health. Documented benefits of engaging with nature include more effective stress management (Kuo, 2001; Parsons et al., 1998), improved cognitive functioning (Taylor, Kuo, & Sullivan, 2001; Wells, 2000), a sense of community belonging (Coley, Sullivan, & Kuo, 1997; Moore, Townsend, & Oldroyd, 2006; Kingsley & Townsend, 2006) and accelerated recovery from illness (Cimprich & Ronis, 2003; Travis & McAuley, 1998). When we connect with nature, we are also more likely to engage in physical activity and other behaviors that improve our health. Engaging with nature may even cultivate ecological sensibilities that motivate us to protect the health of our planet (Carrus, Passafaro, & Bonnes, 2008; Ewert, Places, & Sibthorp, 2005; Hartig, Kaiser, & Bowler, 2001).

In this paper, we integrate socio-ecological thinking in the fields of nursing, health promotion and ecological restoration to critique current gaps in our knowledge of health promotion and environmental health. Based on our critique, we propose an innovative framework for nature-based health promotion and related research. Our aim is to encourage nurses to re-conceive and explore reciprocal health promoting relationships between humans and nature in order to generate evidence-based interventions that strengthen both human and

environmental health. To accomplish this task, we first re-conceptualize health, environmental health and health promotion to account for the complex interdependent relationships among human health and the health of the environment. We then use socio-ecological thinking and principles of ecological restoration to propose a conceptual framework for nature-based health promotion that integrates and strengthens environmental health and health promotion in nursing. Based on this framework, we outline the central components of a restorative approach to health promotion inquiry in nursing research which re-connects citizens, practitioners, policymakers and nature in ways that are relevant to communities around the globe. Our framework is founded on the premise that human health cannot flourish if nature and our vitally-reciprocal relationship with it is in disrepair.

2.02 Background

2.03 Critiquing our current approach to human health and the health of the natural environment: A call for attention to reciprocity. We concur with scholars who argue that urbanization, technological advances and consumptive practices distance people from nature (Louv, 2005; Orr, 1992) and impoverish both environmental and human health as we encounter fewer opportunities to relate to and nurture other living things (Kahn, 1999; Kaplan & Kaplan, 1989; Louv, 2005; Orr, 1992; Roszak, Gommes, & Kanner, 1995). It is not coincidental that our estrangement from nature proceeds in concert with a pace of ecological degradation that threatens both environmental and human health across the globe. As climate change and associated environmental crises

unfold, we deplete natural resources, pollute the soil, air and water, lose biological diversity, toxify food chains, develop related cancers and experience an increased occurrence of vector-borne disease (deKok, Driece, Hogervost, & Briede, 2006; Kellert & Wilson, 1995; Sattler & Lipscombe, 2003; Routledge & Ayres, 2005; Scharze et al., 2006; Schulz et al., 2005; Watterson et al., 2005). Yet, even as we recognize that we exist "in a universe in which all things are connected and in which nature continues to offer its gifts in co-creative partnership for the health and well-being of all" (Burkhart & Nagai-Jacobson, 2000, p. 35), western society remains primarily focused on human health and the treatment of disease. Similarly, many scholars note that environmental health movements within nursing still largely target short-term treatment and the prevention of human exposure to environmental contaminants (Butterfield, 2002; Cook, Jardine, & Weinstein, 2004; Dixon & Dixon, 2002; Eyles & Furgal, 2002; Rogers, 2003; Shah, 2003).

One consequence of a narrow focus on environmental threats is that the quality of human relationships with our natural surroundings remains under-examined, with viable options for engaging with nature within our communities commonly overlooked. To incorporate mounting evidence from the biological and behavioral sciences that engaging with nature has direct, long- term benefits for humans and the environment, we begin our conceptualization of nature-based health promotion with a definition of health that ties together human health and the health of the environment. This allows us to re-think environmental health and health promotion as a vital foundation for nature-based health promotion.

Specifically, we argue that human health reflects our inherent need for "well-being, harmony and growth" (Leddy, 2006, p. 2) and evolves from complex interrelationships between and among people and the environment. Health in this sense "is not given to people but generated by them" (McMurray, 2007, p. 45) through intrapersonal, interpersonal, family, community and political processes (McLeroy et al., 1988; Nutbeam, 1999) that support ecologically-sustainable practices. In this view, environmental health is reflected in the functioning and thriving of all biotic species, including human beings, in relation to their habitat quality, water quality, hydrology, soil and biodiversity (Harwell et al., 1999). To the degree that our practices are ecologically sustainable, we contribute to the health and integrity of the ecosystems of which we are a part. Conceptualizing human-environmental health as a process of participating within our surrounding environments in ways that are ecologically sound (Labonte, 1999; Lebel, 2003; McMurray, 2007) requires us to re-think and strengthen vital ecological links between environmental health and health promotion.

2.04 Re-thinking environmental health and health promotion: A proactive view. Environment has been a fundamental concept in nursing since the days of Florence Nightingale (Nightingale, 1969) and has long been considered one of nursing's four metaparadigm concepts (Fawcett, 1993). However, nurses have only begun to critically examine and address the causal links between disease incidence and environmental contamination in recent decades (Barclay, Hillis, & Ayres, 2005; Buchanan, 2005; Butterfield, 2002; Chalupka, 2001; Dixon & Dixon, 2002; Northridge et al., 2003; Sattler & Lipscombe, 2003; Sinclair,

1999). Consequently, we now appreciate the connections between pesticides, herbicides and other synthetic neurotoxins that we ingest, inhale and absorb and such health concerns as immune deficiency, allergy, autoimmune states, infertility and cancer (Chalupka, 2001; Crinnion, 2000; Wigle, 2003). In response, the International Council for Nurses (1999), Canadian Nurses Association (2005, 2000) and American Nurses Association (2007) have reacted with policies, positions statements and background papers on environmental threats to health. Nurses are also responding in education, practice and research with such initiatives as awareness campaigns about unsafe exposure to lead and ultraviolet rays, hospital green teams for environmental-friendly health practices and community surveys to assess environmental health risks (National Environmental Education Foundation, 2002; CNA, 2005).

Although these reactive efforts to study and reduce environmental harms are crucial, we propose that without equal proactive attention to the positive qualities of the natural environment, our health promotion efforts may contribute to distancing people from healthy interactions and nurturing relationships with nature as we caution them to avoid against UV rays, exposure to pesticides, insect bites and other hazards. This reactive approach to human health promotion also persists in current conceptualizations of environmental health promotion. For instance, Grady et al. (1997) define environmental health promotion as "the promotion of safe, healthful living conditions and protection from environmental factors that may adversely affect human health or the ecological balance essential to long term human health and environmental quality" (p. 73), and Howze et al.

(2004) suggest that environmental health promotion is "any planned process of employing comprehensive health promotion approaches to assess, correct, control and to prevent those factors in the environment that can potentially harm the health and quality of life of present and future generations" (p.433). While both definitions focus on reducing environmental threats, neither emphasizes the importance of proactively promoting our connections with the natural environment to improve both human and environmental health.

To counter-balance a reactive preoccupation with environmental threats, we propose an equally concerted focus on a more proactive, integrated approach to health promotion for humans and nature that is rooted in intentional valuing of and interacting with the natural environment. In this integrated conception of humans and nature, health promotion is a process of "getting to know the will of the people and the resources unique to the community and how these are linked with the wider context and global community" (McMurray, 2007, p. 45) in order to analyze and mobilize individual, collective and environmental strengths and resources (Leddy, 2006) in ecologically sound and ethical ways. This focus on strengths and resources balances mainstream western notions of environmental risks and disease with heightened attention to nature as an irreplaceable source of human health (Laverack, 2004; Maller et al., 2005; St Leger, 2003). This broader socio-ecological perspective on health promotion, which incorporates thinking from the fields of nursing, health and ecological restoration, underscores vital, reciprocal linkages between human and environmental health.

2.05 Data Sources

To piece together this comprehensive view of humans and nature, on-line and manual literature searches were conducted across several disciplinary fields, i.e. nursing, public health, health promotion, health sciences, medicine, environment and behaviour, biological and behavioural sciences, environmental sciences, recreation and leisure, psychology, social sciences, policy sciences, ecology, ecological restoration, anthropology, health geography and urban planning. Key databases, including CINAHL, Medline, Web of Science and Academic Search Premier, were used to access multidisciplinary and international publications. The following search terms were used: natural environment, environmental health, nursing, well-being, spirituality, health, health promotion, public health, outdoors, socio-ecological, systems science, ecological restoration, citizen science and environmental policy. Only English-language publications were included in the review. Theoretical and research publications from 1990-2008 were examined for relevance to nature-based health promotion and used to inform the development of a conceptual framework for nature-based health promotion.

2.06 Discussion

2.07 A socio-ecological perspective on human-environmental health promotion: A restorative approach. In nursing and health literature, socio-ecological perspectives of health promotion highlight the connections between people and their physical and socio-cultural environment (Sallis & Owen, 1997). Sustainable health promotion interventions are conceived as occurring within and

between the intrapersonal, interpersonal organizational, community and policy levels of the healthcare system (Edwards, Mill, & Kothari, 2004; Green, Richard, & Potvin, 1996; Kreiger, 2001; McLeroy, Bibeau, Steckler, &Glanz, 1988; Stokols, 1996), and health promotion extends beyond health education and lifestyle changes to intervening and evaluating strategies at all of these levels (McLeroy et al., 1988; Smith, Tang, & Nutbeam, 2006). Accordingly, a socio-ecological lens informs theory and research across system levels to understand the complexities of health (Grady, Harden, Moritz, & Amende, 1997; Green et al., 1996; Richard et al., 1996).

Dixon and Dixon (2002) illustrate our need for better knowledge of the socio-political processes that individuals, families and communities employ to minimize environmental health risks and protect the natural environment in their integrative systems model for environmental health research in nursing. MacDonald (2004) uses this model to examine the 2003 global SARS epidemic, contending that nurses and other healthcare personnel must address inter-related organizational, community and societal level influences that prevent the spread of disease in tandem with attention to individual behaviors that are causally linked with infection control. Although McDonald's work illuminates how our environment as a socio-political entity contributes to the genesis of disease, it does not examine how a healthy environment contributes to health promotion and a more resilient healthcare system. Similarly, while Laustsen's ecological theory for nursing care (2006) offers a comprehensive account of the environment, it remains focused on threats to human health rather than on a strengths-based

exploration of the healthful qualities of natural environments and the value of engaging with nature.

In an emerging stream of nursing and health systems research (Marck 2004a, 2004b, 2005, 2006; Marck et al., 2006a, 2006b), theory, research and practice in the field of ecological restoration, which focuses on the study and recovery of ecosystems that have been degraded, damaged, or destroyed (Society for Ecological Restoration, 2004), is used to re-conceptualize health, healthcare systems and health care. With an emphasis on supporting human (socio) and natural (ecological) interactions that strengthen the integrity of ecosystems (Hobbs & Norton, 1996; Higgs, 2003; MacMahon, 1997), good restorations lead us to question how we engage with nature to generate "healthier relationships between people and the ecosystems in which they live" (Higgs, 2003, p.348). Using engagement with nature and other principles of good restoration to critique our current approaches to health systems management as technologically over-determined and ecologically neglected (Marck, 2000), a restorative framework for health systems is intended to encourage healthcare professionals and citizens to develop a deeper respect and care for each other and the living systems we inhabit (Marck et al., 2006b). When we combine a restorative approach in healthcare systems with a socio-ecological approach to health promotion and environmental health at multiple levels (intrapersonal, interpersonal, organization, community and policy), we generate a proactive view of health that accounts for the healthful qualities of natural ecosystems and the significance of our relationship to nature. Specifically, we confront the consequence that nature, which encompasses both

human and environmental health, is sustained rather than degraded to the extent that we nurture healthy inter-relationships through our individual and communal engagement with and care of, the places we share.

2.08 Ecological restoration and nature-based health promotion: Conceptual links. Whether focused on an urban industrial park, an Acadian forest or a salt marsh, ecological restorations bring together researchers, citizens, practitioners and decision-makers to help study and restore natural ecosystems to healthy, evolving and sustainable states (Hobbs & Norton, 1996; Higgs, 1999, 2003, 2005; MacMahon, 1997). Historically in nursing, we have practiced from a humanistic perspective (Austin, 2001) that prioritizes short-term benefits to human health (Bonnicksen, 1988) - a perspective which often negates the natural environment and its long-term influence on human health (Ehrenfeld, 1981; Tribe, 1972). In contrast to humanism, the ethic of sentientism which informs ecological restoration encourages us to consider the needs of humans and nature as an integrated whole (Bonnicksen, 1988; Eckersly, 1992; Ehrenfeld, 1981; Tribe, 1972; Engel, 1998). In the field of restoration, therefore, caring for nature is both a scientific and a cultural project that entails the ethical enactment of ecologically sound relationships between all species (including humans) and other ecosystem elements such as water quality, soil and habitat (Higgs, 2003; Hobbs & Norton, 1996). This interdependence of culture and ecology means that, from a restorative perspective, our capacity to engage with and nurture the health and integrity of our communities reflects our capacity to engage with and nurture the health and integrity of the living systems we share (Higgs, 2005).

One exemplar of the culture-ecology connection, which Higgs (2003) explores in restoration and that Marck (2000) pursues in health care, builds on Borgmann's work in philosophy of technology (1999, 1992, 1984) and centers on his concepts of focal practices and focal things (1984). For Borgmann, focal things are "commanding, centering and deep" phenomena that ask for our engagement and show us what matters morally for a good life, such as wilderness, a family table, a meeting place for neighbors or friends, or a good path to hike. In turn, focal practices are conceived as the habits, relations and rituals that orient us to attend to these focal things, such as taking a daily walk, eating a meal together or going to communal gatherings to debate the public good. Unlike the hasty consumption of junk food, television shows or other quickly-replaced commodities, focal practices are not easy, superfluous or expedient activities, but rather are committed actions that exact an effort which is commensurate with the benefits they promise. If we walk through the forest instead of driving past it, we exert our own energy and feel the energy of the living world around us. When we make a meal instead of "grabbing a bite", we thoughtfully prepare the food and table to find fellowship, and when we volunteer at a school instead of just writing a cheque, we take part in giving children what they need in order to learn and grow.

For both Borgmann and Higgs, focal practices include the hands-on work of engaging with nature in the conduct of everyday activities, as well as in active restoration projects, to foster moral commitments to the long-term health of the mountain terrain, marshland, forests and other places we inhabit. In Higgs' view,

focal restorative practices therefore "create a stronger relationship between people and natural process, a bond reinforced by communal experience" (2005, p. 242). We concur and argue further that the focal practice of engaging with nature cultivates ecological sensibilities that are equally critical to both environmental and human health. Ecological sensibility refers to our understanding of and responsiveness to the reciprocity between human health and the environment and our respect and concern for nature (Pooley & O'Connor, 2000; Brown & Bell, 2007; Rodman, 1983). These ecological sensibilities enable us to re-envision human communities as part of and inseparable from nature, inextricably linking our efforts to promote human health with our efforts to promote the health of our world.

2.09 A conceptual framework for nature-based health promotion in nursing. Our proposed conceptual framework (refer to Figure 2.1, p. 51) is based on linked conceptions of human and environmental health and health promotion which recognize that interventions supporting human engagement with nature develop the individual and collective ecological sensibilities we need to generate reciprocal benefits for human and ecosystem health.

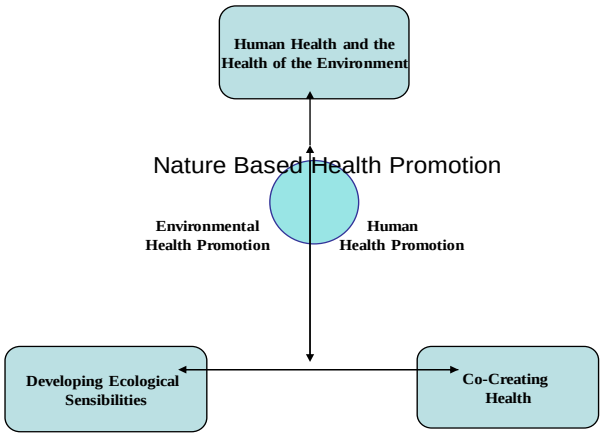


Figure 2.1. Fundamental elements and outcomes of nature-based health promotion

2.10 Developing ecological sensibilities. We contend that the ecological sensibilities which guide good restorations are equally relevant to our work in environmental health and health promotion. As Higgs (2005) suggests, "in losing an authentic engagement with things, we lose sight also of moral commitment to those things" (p. 203). Research findings support Higgs' case that when we restore our everyday sensitivity to and connections with natural environments, we foster focal practices that are both ethically and scientifically sound for the health of people and the environment. For instance, Ewert, Place and Sibthorp's (2005) research on the effects of early life experiences on environmental beliefs of university students suggests that childhood experiences (e.g. informal recreation such as camping) helps develop emotional attachments to the natural environment. Furthermore, findings from Hartig et al.'s (2001) survey of university students

indicate that people who understand the potential for restoration from natural environments are more likely to exhibit ecologically-responsible (e.g. less consumptive) behavior such as recycling and driving less. Ecological sensibilities, then, are our intrinsic values and our ecological understandings of health that are fostered through experience in nature. Our ecological sensibilities influence our decisions and actions in nature (Pooley & O'Connor, 2000; Brown & Bell, 2007; Rodman, 1983) and help shape how we, together with each other in consideration of nature, co-create health.

2.11 Engaging with nature to co-create human and environmental health. Examples of current research findings on engagement with nature and the promotion of health can be synthesized into three categories (Pretty, 2004) as a way of substantiating the significance of and potential for co-creating human and environmental health. These categories are: 1) viewing nature, such as from a hospital or kitchen window; 2) incidental contact with nature during another activity, such as cycling to work or walking through gardens in hospitals; and 3) active participation in nature, such as creating a community garden or restoring an old parking lot to a community green space. In our proposed framework, engagement refers to any of these levels, from viewing nature to 'hands-on' caring for it.

Viewing nature. Research data suggest that viewing nature can positively influence human health. Travis and McAuley's (1998) findings reveal that viewing trees and natural settings from a hospital window can be a positive restoration activity for participants hospitalized following hip surgery.

Furthermore, Ogunseitan's (2005) data indicate that exposure to ecosystem diversity (e.g. flowers, rivers, animals) for people working and living on a university campus is positively associated with their perceived quality of life. The significance of viewing nature is also evident in Parsons, Tassinary, Ulrich, Hebl, and Grossman-Alexander's (1998) study, where participants exposed to various scenic drives were assessed for stress recovery measures before and after exposure. Those who viewed routes through nature experienced quicker recovery from stress.

Incidental contact. Jansen and Sadovszky (2004) studied the restorative activities of community-dwelling elders and found that passive and active activities in the natural environment can promote a sense of well- being. Similarly, data from Pretty, Peacock, Sellens, and Griffin's (2005) study indicate that combining physical activity with exposure to nature can have a positive effect on self-esteem. The significance of incidental contact with the natural environment has also become evident in studies with children. For instance, Taylor et al. (2001) studied the effects of nature on children with attention deficit disorder and found that their attention functioning can improve with activities in nature. The more "green" the play area, the less severe the symptoms of attention deficit disorder. Similarly, Wells (2000) studied the effects of children's home environment on their cognitive development and found that those in homes with more nature-based surroundings had higher levels of cognitive functioning than those not surrounded by natural settings.

With implications for community design, Kuo (2001) studied the impact of the natural environment on those living in poverty and found that residents who lived in urban public housing complexes with surrounding trees and green spaces reported their needs and problems as less severe and more manageable compared to those living in buildings without access to green space. Similarly, Kuo and Sullivan (2001) examined the relationship between the environment and crime in the inner city, and found that non-green residential areas had higher rates of crime compared to areas where buildings had surrounding vegetation.

Active participation with nature. Cimprich and Ronis (2003) studied the effects of a nature-based intervention on the cognitive attention of women diagnosed with breast cancer, and found that participants who engaged in nature-based activities (e.g. visiting a botanical garden, watching birds, tending plants) experienced improved cognition and reduced metal fatigue compared to those who did not engage with nature. Kingsley and Townsend (2006) research is another example of evidence on the benefits of active engagement in nature, suggesting that involvement in urban community gardens can foster increased social cohesion, social support and social connections and can be mechanisms for developing social capital. Furthermore, Moore et al.'s (2006) findings indicate that involvement in conservation groups can contribute to participants' health and well-being and promote community cohesiveness in rural settings. These authors also suggest that building social capital is linked to engagement with nature and may correlate with the development of pro-environmental behaviors.

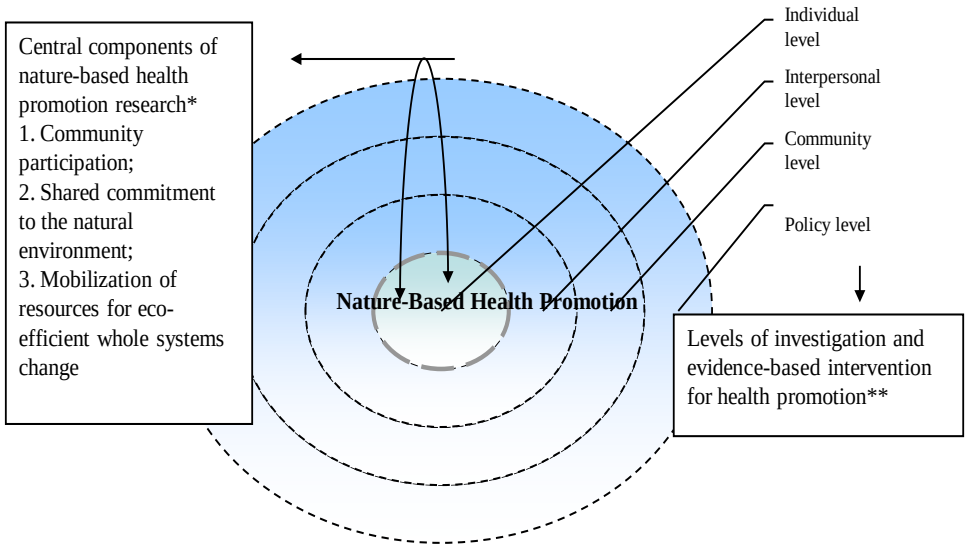
This synopsis suggests that viewing nature holds potential for human health promotion; that incidental contact with nature may help restore health and well-being in older adults, improve cognitive functioning in children, help manage stress and reduce rates of crime; and that more active hands-on work in nature may have benefits for human health and help to develop pro-environment behaviors. Taken together, these findings support our call to dissolve traditional conceptual silos of human health promotion and environmental health in order to re-formulate human and environmental health as one integrated socio-ecological phenomenon in the study and conduct of health promotion. In this re-formulation, nature-based health promotion involves focal practices of engaging with nature to develop ecological sensibilities that unite humans with their natural environment and promote health at multiple levels. To pursue this integrative aim, however, further research and theory building are required.

2.12 Implications for Nursing

2.13 Recommendations for future research and theory-building. Our framework for nature-based health promotion requires us to develop knowledge and practice at the juncture of health promotion and environmental health. Although the studies described earlier offer evidence of the value of engaging with nature, the number of nursing studies exploring the healthful reciprocity between health and nature (e.g. Cimprich & Ronis, 2003) is very limited. In addition, despite the studies conducted in other disciplines, several gaps remain in the overall literature on engagement with nature. Specifically, we have knowledge deficits in relation to: 1) narrative accounts and experiential perspectives about

engaging with nature in local contexts including hospital, community and rural settings; 2) the barriers and contributors to engaging with nature within communities; 3) how to integrate nature-based interventions into other health promotion programs (e.g. healthy eating and active living); and 4) research-based recommendations for citizens, healthcare practitioners and policymakers.

To contribute to closing these gaps in our knowledge, researchers need methodologies that foster a participatory ethic of working with participants (e.g. citizens, practitioners, policymakers) across multiple levels of the health system to study and strengthen relationships between communities and nature in service of human and environmental health. Figure 2.2 (refer to p. 57) offers a visual depiction of the socio-ecological levels and central components of nature-based health promotion research that are congruent with restorative and socio-ecological thinking: community participation; shared commitment to the natural environment; and the mobilization of resources for eco-efficient whole systems change.



* Chinn, 2004; Higgs, 1999, 2003; Laverack ,2004; Marck, 2004a, 2004b, 2005, 2006; Marck et al., 2006; McMurray, 2007; Israel et al.,1998
** Edwards, 2004; Kreiger , 2001; McLeroy et al., 1988; Stokols, 1996

Figure 2.2. Research in nature-based health promotion: Components of a restorative approach

2.14 Community participation. The socio-ecological notion that communities are open systems constituted by complex relationships among its members and the environment stems from definitions of ecological communities in the biological sciences (McMurray, 2007). In a socio-ecological sense, communities of people are constituted by the values and concerns they share (Chinn, 2004). Building communities of people who care about our healing relationships with nature means designing studies that enable participatory,

dialectical processes to facilitate community cohesiveness, support diversity and create change. Honouring diversity and developing cohesiveness helps to build collective memories and offers insights leading to meaningful change (Chinn, 2004).

Health promotion requires political action directed at creating social change (Labonte, Woodard, Chad, Laverack, 2002; Laverack, 2004). Thus, community members' experiences are fundamental starting points in health promotion. Learning from people's experiences "remains one of the most potent ways we have devised to share wisdom " (Laverack, 2004, p. 1) and determine how best to use research findings in ways that are relevant to and sustainable within the community (Best, 2003a; Best, 2003b; Marck, 2004a, 2004b; Israel et al., 1998). As Labonte (1999) notes:

> If we are to have any influence on those public policies that 'determine' health determinants, it will not come from arguing facts alone. It may come through the alliances we make with persons, groups and organizations that share the same ethical or value base that informs health promotion. (p. 372)

In this view, it is not necessary to 'prove' that nature influences human health, although there is ample evidence to this effect. Instead, the central components of nature-based health promotion research (Figure 2.2) are understood as valuable pathways to the development of ecological sensibilities that enable us to strengthen and sustain human and environmental health.

2.15 Shared commitment to the natural environment. Our individual values, beliefs and experiences influence both how we understand health and how we engage or promote engagement with nature in our personal and professional

lives. By individually and collectively critiquing our connections with nature, we initiate a shared ethical concern for it (Engel, 1998). For example, Kinne (1997) suggests that it is time for researchers to adopt an eco-ethic and

> … ask not only what is good or bad in human societies but also what is good or bad for the total system 'humanity plus nature'. Such a modern ethical concept weighs human behavior against its value for reconciling human needs with the needs of natural ecosystems – the cradle and basis for life on earth. (p. 1)

Midgley (2007) suggests that researchers have tended to focus uncritically on human beings and human societies, while marginalizing the very environments with which they are inextricably linked. Ignatow (2006) offers an ecological model that accounts for this modern ethical imbalance, suggesting that our relationship with nature is one where "humans are dependent on and interconnected with the natural world and can, with the help of science and technology, achieve an ecologically balanced relationship with nature" (p. 443). Borgmann (1984), Higgs (2003) and Marck (2000) remind us that how we do or do not use focal practices in modern technological societies to engage with each other and the environment greatly predicts how we understand and attend to the ecology of health, for nature and for ourselves. In nursing, Marck (2005) suggests that Borgmann's call for focal practices to re-balance technology and ecology requires us to ask: "What relations, practices and conditions foster the integrity and sustainability of a particular living system and its inhabitants?" (p. 234). In essence, this question drives us to seek and strengthen resources within nature and within ourselves as part of nature, that accelerate and sustain what some researchers now define as healthy whole systems change (Edwards et al., 2007).

2.16 Mobilizing resources for eco-efficient whole systems change.

From a whole systems change perspective, thinking restoratively about nature-based health promotion research involves recognizing and attending to ethical, historical, cultural, economic and other influences that shape community knowledge and actions (Higgs, 2003; Marck et al. 2006a). Research in nature-based health promotion should therefore be grounded in the everyday lives of people and build capacity for self-sustaining change within communities (Israel et al., 1998; Smith et al., 2006; Wallerstein & Duran, 2003). Ideally, researchers seek to mobilize social, political and physical resources in ecologically efficient and effective ways that help us to understand, facilitate, evaluate and sustain multi-level, community-relevant and sustainable change (Edwards et al., 2004; Kreiger, 2001; McLeroy et al., 1988; Stokols, 1996).

Nurses and other professionals exhibit socio-ecological thinking when they combine health education with political action, social mobilization and advocacy to expand the impact of their work "…from the individual, to the group, to the wider community" (Laverack, 2004, p. 15). In envisioning future advancements, Labonte (1999), Nutbeam (1999) and Norton (1998) contend that heath promotion professionals must expand their focus to consider the context of health, including the power relations and politics which influence the conditions for supporting health. As Norton contends, "It is perhaps inappropriate to focus any efforts at promoting health exclusively upon individuals and their behavior, without a corresponding effort to raise public awareness and an attempt to change those environmental and social circumstances which affect health" (p. 1274).

Participatory research methods foster the community involvement, mobilization of resources and system level changes that are needed to develop and maintain commitments to nature and health.

2.17 Conclusion

The relationship between engaging with nature and health is non-linear and shaped by multiple factors, including but not limited to our awareness of the phenomenon, our childhood life experiences and our access to natural places. Given that engaging with nature influences human and environmental health, our research questions and methods need to cross conceptual and sectoral boundaries to spur nature-based health promotion research across several fields that informs whole systems change. As nurse researchers work with multidisciplinary teams that include the health and social sciences, environmental sciences, education, community/urban planning, agriculture and communities to collectively examine and create healthy living within our environments, we need to move beyond a reactive focus on reducing environmental threats to human health. Specifically, we must adopt participatory, integrated approaches to knowledge development that inform and advance nature-based health promotion in nursing in ways that are relevant to citizens, practitioners, policymakers and community contexts across the globe. Using principles adapted from the fields of ecological restoration to critique and inform health systems and socio-ecological thinking in health promotion and environmental health, we can foster a collective accountability to the reciprocity between humans and nature and improve the short- and long-term health of individuals, families, communities and our world.

2.18 Summary Statement

What is already known about this topic

- Degradation of the natural environment is having a negative impact on human health.
- Healthcare professionals are reacting to environmental threats to human health with research and practice that is primarily aimed at understanding and minimizing related risks and disease.
- There are inherent health benefits for humans and the environment in caring for and engaging with nature.

What this paper adds

- A conceptualization of health, environmental health, and health promotion that accounts for the complex interdependent relationships between human health and the health of the environment.
- A framework for nature-based health promotion that integrates and strengthens current practice in environmental health and health promotion in nursing in ways that are relevant to communities across the globe.
- A restorative approach to advancing research and theory-building in nature-based health promotion.

Implications for practice and policy

- A restorative approach to nursing research can help us to engage multidisciplinary colleagues and citizens in examining and developing ecologically sound, nature-based strategies for fostering health.

- Nurse researchers in nature-based health promotion need to adopt a participatory ethic, a commitment to the natural environment, and methods that enable the ecologically-efficient mobilization of resources across multiple levels of the health system.
- A restorative approach to nursing research and theory-building can help us to develop practice and policy for sustainable, effective, and efficient whole systems change.

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Chapter Three: Engaging with Nature to Promote Health: Bridging Research Silos to Examine the Evidence

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3.01 Introduction

Connecting with nature through community walking trails, gardens, parks, or other initiatives can be health promoting for individuals, families, communities, and shared natural ecosystems. Research suggests that connecting with natural environments can restore cognitive attention (Cimprich &Ronis, 2003; Kaplan, 1983, 1995; Kaplan & Kaplan, 1989), positively influence blood pressure and self esteem (Pretty, Peacock, Sellens, Griffin, 2005), decrease symptoms of attention deficit disorder (Kuo & Taylor, 2004), facilitate recovery from surgery (Ulriche, 1984), increase perceptions of quality of life (Ogunseitan, 2005), strengthen community cohesion (Moore, Townsend, & Oldroyd, 2006), and motivate pro-environmental behavior (Hartig, Kaiser, & Bowler, 2001) among other benefits. Nature-based outdoor therapies and interventions are rooted in a body of scientific evidence that is increasingly being used across health-related fields for the restorative effects on people and their shared natural environments (Berger & McLeod, 2006; Beringer & Martin, 2003; Burns, 1998; Lundgren, 2004). Nature provides conditions that foster human and environmental health, from reducing stress and enabling physical activity, to growing and consuming local produce.

Despite evidence that being in and caring for the natural environment is health promoting for people and our world, many argue that increasing numbers

of citizens across the globe are disconnected from nature (Frumkin, 2001; Kahn, 1999; Roszak, Gomes, & Kanner, 1995; Stilgoe, 2001) as they adopt increasingly consumptive lifestyles in technologically driven societies (Borgmann, 1984; Marck, 2004; Strong & Higgs, 2000). This collective failure to connect with nature and its health promoting properties is accompanied by a preoccupation with disease and environmental threats (Hansen-Ketchum, Marck, & Reutter, 2009). It is time to re-examine our relationship with the natural world to identify valuable, underutilized implications for research, practice and policy in health promotion. A critical understanding of nature-based health promotion can help us change the way we use our natural and human resources and transform how we create healthy living conditions for people and the world. In this paper, we use a conceptual model of nature-based health promotion and socio- ecological thinking to critically review and synthesize research across several fields to clarify our health promoting relationships with the natural world and generate implications for health promotion research, practice, and policy.

3.02 Conceptualizing Nature-based Health Promotion

For purposes of this paper, nature is defined as outdoor natural ecosystems such as trees, water, and walking trails, found in everyday local contexts (Maller et al., 2008) Nature-based health promotion is founded in a strengths-based proactive perspective of health promotion that supports activities and conditions to enable health through access to nature (Hansen-Ketchum et al., 2009). Nature-based health promotion merges silos of human health promotion and environmental health and is tied to a complex array of factors, including our

sensitivity to nature as well as our access to and on-going engagement with the natural world. Our literature review draws on the central constructs of nature-based health promotion to examine the linkages between health and human engagement with the natural environment.

3.03 Socio-ecological Thinking and Health Promotion

The levels depicted in McLeroy's (1988) socio-ecological model for health promotion are used in this paper to demonstrate the linkage between evidence and the multiple socio-political layers of health promotion including (a) the individual and family, (b) the organization level, and (c) the community level. Within and between each of these levels nature-based health promotion "accounts for the healthful qualities of natural ecosystems and the significance of our relationship to nature" (Hansen-Ketchum et al., 2009, p.1530).

Traditionally, health promotion in western society has focused heavily on individual education with the goal of changing health-related behaviors. A socio-ecological approach to health promotion combines behavior change and environmental-based interventions (McLeroy, 1988) to create sustainable conditions wherein healthy behaviors can occur regardless of income, education, and physical location (Cummins & MacIntyre, 2002). This type of systems thinking is critical to a thorough examination of multi-disciplinary evidence relevant to the multi-level complexities of nature-based health promotion.

3.04 Examining the Evidence for Nature-based Health Promotion

Research evidence in this section lends insight into the constructs of nature-based health promotion at the individual and family, organizational, and

community levels. Primary source peer-reviewed research reports were found through electronic and manual literature searches across a number of fields including nursing, public health, health promotion, medicine, biological sciences, environmental sciences, recreation and leisure, psychology, social sciences, health geography and urban planning. Key databases included CINAHL, Medline, Web of Science, and Academic Search Premier. Search terms included: natural environment, restorative environment, nature, health, well-being, health promotion, spirituality, and recreation. Inclusion criteria included: 1) English-language publications, 2) research that focused on the outcomes of engaging with nature in organizational and community contexts; 3) reports on findings with potential implications for human and ecosystem health. We excluded studies if they focused on animal-assisted therapy or horticultural therapy. Although we recognized their related contribution, they were beyond the scope of this paper. Further, studies were excluded if they had unclear implications for community-based health promotion interventions and were published before 1990. Although over 300 articles were reviewed, fifteen were selected based on the above criteria to help exemplify the state of current evidence on engaging with nature across fields and to provide insight into trans-disciplinary knowledge gaps relevant to health promotion. Table 3.1 (see p. 77) provides a summary of the types of research examined for this review.

Table 3.1
Types of Research Examined

Experimental and quasi-experimental designs	Mixed methods	Intervention	Qualitative
Parsons et al., 1998; Moore et al., 2006; Wilkes et al., 2005; Taylor et al., 2001; Kuo & Taylor, 2004; Pretty et al., 2005; Kuo, 2001; Wells, 2000; Hartig et al.2001; Ogunseitan, 2005; Kuo & Sullivan, 2001	Cox, Burns, & Savage, 2004	Crimprich & Ronis, 2003	Kingsley & Townsend, 2006

A description of this relevant literature is described next; for a listing of additional research on the health benefits of connecting with nature refer to the comprehensive report by Maller et al. (2008).

3.05 Individual and family levels of nature-based health promotion. A number of studies offered evidence of the individual effects of connecting with nature and the influence on pro-environmental behavior.

Parsons, Tassinary, Ulrich, Hebel, & Grossman-Alexander's (1998) experimental study provided insight into individuals' physiological response to nature-dominated roadside environments. College students (n=160) were exposed to mild and active stressors and one of four video simulated scenic drives through outdoor environments (e.g. natural artifact dominated urban and rural settings). Stress recovery, measured by facial muscle activation, blood pressure, and electro-dermal activity was recorded before and after exposure. Although not all outcomes were statistically significant, evidence showed that participants experienced quicker recovery from stress with routes through nature compared to artifact-dominated roadside environments. Participants' narrative accounts of

past and present experiences in similar settings would have helped interpret the results.

Cimprich and Ronis (2003) used a longitudinal intervention study to examine the effects of connecting with nature on attention and mental fatigue in women diagnosed with breast cancer (n=185) who were randomly assigned to an intervention or non-intervention group. Members of the intervention group were asked to engage in nature-based activities at home or in the community (e.g. 120 minutes per week visiting a botanical garden or scenic spot). Analysis revealed a significant effect of the natural restorative intervention on total attention scores for those in the intervention group ($p < 0.001$). Data about what enabled or challenged engagement with nature would have helped understand ways to strengthen and sustain the intervention.

Wells (2000) examined the influence of nature on the cognitive functioning of children in low income urban families. Using a longitudinal design, Wells assessed the attentional capacities of seventeen children living in houses devoid of natural restorative resources and then again with these same children after they relocated to houses with better access to nature. Instruments were used to assess naturalness (e.g. view from the windows), housing quality characteristics, and mothers' perceptions of their children's cognitive function and ability to focus their attention. Results from hierarchal regression analyses suggested that the naturalness of housing was a statistically significant ($p<0.01$) predictor of children's attentional capacity.

Hartig et al. (2001) used structural equation modeling to analyze questionnaire data on perceived restorativeness of nature-based places and related pro-environmental behaviors from university students (n=488) in biology and social ecology. Data was used to test a structural equation model and analysis confirmed the hypotheses that pro-environmental behaviors such as recycling were more likely among those who valued the restorative qualities of nature; 23% of the variance in behaviours was predicted by perceptions of restorativeness. Statistically significant correlations were found between fascination with restorative places and pro-environmental behaviors.

Moore et al. (2006) studied the effect of involvement in nature conservation groups on human health, well being, and social connectedness. The sample included 102 people; 51 members of land conservation groups in rural communities and 51 control participants (matched by age and gender) not involved in conservation activities. Questionnaires for health and wellbeing and community cohesion were used in face-face interviews. Members of conservation groups rated their health higher compared to participants in the control group ($p=0.028$) with a statistically significant difference among those aged 45-65 years ($p=0.017$). Members also reported an increased sense of belonging ($p=0.005$) and a greater willingness to improve their community ($p=0.010$) compared to those in the control group. Although these findings provided evidence on the benefits of conservation activities, the sample size was small and it was uncertain whether conservation group members had higher scores prior to their involvement in

nature conservation; perhaps healthy or community-minded people were more apt to participate in conservation initiatives.

Despite the limitations, research relevant to the individual and family level in this section suggests that engaging with nature has the potential to foster recovery from stress, improve cognitive attention, influence health and well being, and shape pro-environmental behavior.

3.06 Organizational level. Studies linked to the organizational level in this review provide evidence for the formal and informal institutional-based factors that support, or not, engagement with nature and the promotion of health.

Wilkes, Flemming, Wilkes, Cioffi, and Miere (2005) used a quasi-experimental design (time series) to analyze the effect of a special care unit on the agitation behaviors of 23 participants living in a nursing home. The special care unit provided unrestricted access to a garden and outdoor paths among other new features. Agitated behavior, cognitive function, and physical activity were measured prior to and after residents moved to the special care unit. Although scores for aggressive behaviors did not significantly change over time, scores for overall agitated behavior and verbal aggression significantly decreased when the difference between pre-move and 3-month scores were analyzed ($p=<0.001$). The study did not provide details on staffing, models of care, or other contextual data that could have helped interpret the findings.

In a similar study Cox et al. (2004) used mixed methods to examine the effects of two types of multi-sensory environments (e.g. a Snoezelen room with balls and bubbles and a landscaped garden) for older individuals living with

dementia in a nursing home. Twenty-four residents were observed over time in each of the environments with their affect rated for signs of pleasure, interest, and contentment. Non-parametric statistics were used to compare the rating scores. Six visitors and six caregivers were also interviewed, with qualitative data analyzed for themes. Although the quantitative data did not show any significant difference in affect, the qualitative data indicated that the Snoezelen room and the landscaped garden benefited the well-being of residents and staff but were not readily used due to limited staff available to supervise residents in these settings.

Ogunseitan (2005) used participant data from those working and living in a university setting (n=379) to test the associations between preferences for ecosystem components and restorative environments and quality of life. Structural equation modeling was used to test the fit of a model linking topophilia (bond between people and their environment) and quality of life. Among other correlations from model indices, ecodiversity (e.g. trees, pond, rocks) was significantly correlated with overall quality of life measures ($r=0.123$; $p<0.005$). Qualitative accounts of participants' experiences would have strengthened the interpretation of the statistical associations to foster a better understanding of contextual influences.

With implications for schools, day cares, and home environments, Taylor, Kuo, and Sullivan (2001) and Kuo and Taylor's (2004) research suggested that children with attention deficit disorder benefited from engagement with nature. When children in these studies played in nature, their symptoms of attention deficit disorder decreased. For instance, Kuo and Taylor (2004) used a 2X2

repeated measures ANOVA (physical context X social context) to analyze data from 452 surveys in a non-probability sample of parents across the United States. They found that symptoms of attention deficit hyperactivity disorder were significantly reduced when children engaged in activities in outdoor nature-based settings ($F_{1375}=32.1$, $p<0.0001$) compared to when they participated in the same activities in non-green indoor built settings ($F_{1386}=21.9$, $p<0.0001$).

Findings relevant to the organizational level of health promotion in this review suggest that eco-diverse living and working conditions can influence perceptions of well being and quality of life and can decrease symptoms of attention deficit disorder.

3.07 Community conditions and context. Studies examined under the community level of health promotion focus on the processes between organizations that support health and engagement with nature.

Pretty et al.'s (2005) findings indicated that exposure to nature during physical activity positively affected blood pressure and self-esteem. The researchers exposed five groups of 20 participants to simulated outdoor scenes while exercising on tread mills. The scenes included previously categorized photographs of rural pleasant, rural unpleasant, urban pleasant and urban unpleasant environments. One group acted as a control group and viewed a blank screen. All participants adhered to the same exercise protocol. Blood pressure, self-esteem, and mood were measured before and after viewing the scenes and analyzed using a one way ANOVA test. Rural pleasant scenes (e.g. trees and vegetation) had the greatest effect on systolic blood pressure compared to urban

unpleasant ($p<0.001$) and rural unpleasant groups ($p<0.05$). Rural pleasant scenes also had greater influence on self-esteem than exercise alone with 80% of participants in this category showing an increase in self-esteem. Rural unpleasant scenes and degradation of the country side had the least effect. Narrative accounts from participants would have provided a deeper understanding of the relationship of the scenes to self esteem and mood. For instance, participants' past experiences in rural and urban settings could have influenced responses to simulated scenes.

Kuo (2001) surveyed those living in poverty in an urban centre to understand the influence of the natural environment on those whose high-rise housing units have traditionally provided very little access to gardens and other vegetation. Residents (n=145) were randomly chosen from architecturally identical residential buildings. Survey instruments were used to measure residents' attentional capacity and life functioning and photographs were used to assess nearby nature. Statistical analysis (e.g, mean, sd, t-statistics) revealed that residents who lived in housing complexes with surrounding vegetation reported their needs and problems as less severe and more manageable compared to those living in buildings without nearby nature, even when controlling for age, income, employment, and other extraneous variables ($p= 0.01$). The findings did not provide insight into how residents engaged with nature or their qualitative accounts of the significance of nearby nature.

Evidence from Kuo and Sullivan's (2001) study suggested that non-green residential settings in urban areas were associated with higher rates of crime

compared to more ‘green’ areas with surrounding vegetation. Photographs were used to assess the density of trees and other vegetation around 98 select residential buildings. The relationship between vegetation and police crime indices were then examined. Fisher analyses were used to compare low versus medium vegetation in relation to crime with a significant difference reported ($p < 0.05$). Buildings with higher levels of vegetation had 52% fewer crimes than those with low level vegetation. Multiple regression techniques identified a negative relationship between crime and vegetation even when other confounding variables (such as building height, number of apartments and vacancies) were controlled. Data from this study countered more traditional notions that vegetation contributes to crime in urban centers. Kuo and Sullivan (2001) suggested that carefully managing vegetation (e.g. high canopied trees, low shrubs) can prevent crime while providing recreational and social opportunities important to health and well being.

Kingsley and Townsend (2006) examined the social connections of those involved in an urban community garden project. The researchers used semi-structured interviews to analyze the experiences of 12 participants. Although the sample lacked diversity in terms of socio-economic status, the evidence indicated that involvement in urban community gardening fostered social cohesion, benefiting the health and well being of community members and their shared environment.

Findings reviewed in this section for relevance at the community level provide valuable insight into the linkages between community-based access to

nature and human well being, life functioning, crime, pro-environmental behavior, and social cohesion.

Although research to-date provides ample evidence to support our call for greater attention to the reciprocal health promoting connections between people and surrounding natural ecosystems, there are limitations in this body of literature. It was evident from our review that in many cases, the interpretation and reporting of findings could have been strengthened by narrative accounts from participants themselves, with greater detail on their home, institutional, and community contexts. Furthermore, few studies used a participatory research approach that brought together community citizens, practitioners and policy makers from various sectors to examine the socio-ecological features and strategies needed for health promotion.

3.08 Implications for Research, Practice, and Policy

Our appraisal of the literature suggests that there are specific knowledge gaps in the literature related to 1) individual and everyday experiences of engaging with nature in local settings, particularly in rural communities; 2) citizens' perceptions of the barriers and facilitators to engaging with nature in their local settings; 3) socio-political and environmental conditions that contribute to disparity in ability to engage with nature, particularly among disadvantaged groups; 4) perspectives of health practitioners and policy-makers on nature-based health promotion; 5) correlations between human and environmental health in relation to nature-based health promotion; 6) socio-ecological complexities of engaging with nature in the promotion of health; 7) nature-based interventions in

community contexts; and 8) nature-based interventions used in conjunction with other health promotion and/or ecological initiatives (e.g. active living programs, creation of green spaces).

Despite these gaps, research findings are helping to map the health-promoting connections between humans and nature and encourage us to begin to tease out ecologically sound ways of enabling health through research, practice and policy. For instance, Cimprich and Ronis' (2003) study on attention restoration for breast cancer patients, has implications for health education in connecting patients with nature for the recovery from breast cancer. Further to this, there are implications that spill over into organizational and community levels where networking with members of the health care team and partnering with representatives from urban planning, recreation, the local botanical garden, and department of transportation for instance, can enable access and equity of resources for engagement with nature in consideration of disparities in patients' incomes, location of residence, and support network among others.

At the organizational and community level, findings from studies like Taylor et al. (2001), and Kuo and Taylor (2004) suggest that children's cognitive functioning can be improved with active play in nature, with critical implications for collaborations among families, public health professionals, urban planning, day care centers, schools, and parks and recreation. Local collaborative knowledge building and research on nature-based health promotion is needed to identify ecologically sound strategies for this to happen; playgrounds with ample vegetation and school vegetable gardens are examples of this. Still other findings

suggest that trees and vegetation around family residential buildings can negate crime (Kuo & Sullivan, 2001), improve life functioning (Kuo and Sullivan, 2001), and that being in nature can promote recovery from stress (Parson et al. 1998), encourage development of ecological sensibilities and pro-environmental behaviour (Hartig et al., 2001), and provide synergistic effects when combined with physical activity (Pretty et al., 2005). Enabling these types of health outcomes entails what Edwards, Marck, Virani, Davies, and Rowan (2007), Marck, Higgs, Edwards and Molzahn (2006) and Dooris (2004, 2006) call whole system change.

Whole system change requires "an integrated and effective contribution to economic, environmental and social well-being, not only at a local level but regionally, nationally and globally" (Dooris, 2004, p. 59). It means bridging traditional silos and bringing people together to develop ecological sensibilities and recreate socio-ecological systems that are responsive to the reciprocal connections between health and nature at the individual, organizational, and community level (Hansen-Ketchum et al., 2009). Capra (2005) suggests that this type of ecological thinking requires that we move from thinking of "parts to the whole", from "objects to relationships", from "objective knowledge to contextual knowledge", from "quantity to quality." from "structure to process", and "from content to patterns" (p.19-20). Initiatives of Fritjof Capra's Centre for Ecoliteracy (see http://www.ecoliteracy.org/) can further exemplify these shifts. The center's citizen-based and multi sectoral work in practice and policy is modeled on the principles of ecology and aimed at education for sustainable living. Exemplar

initiatives include project-based learning to improve local environmental quality, develop school gardens, and enable food security. These initiatives target students, parents, teachers, researchers, practitioners, and decision makers from multiple sectors within the community and beyond.

Health promotion is a multi-level multi-intervention process (Edwards, Mill, & Kothari, 2004) that involves on-going participation in knowledge building and action among community citizens, organizations, practitioners, and decision makers across sectors, often outside of traditional health services sectors (Dooris, 2004). It is a process that draws on the notion that health is influenced by the quality of interrelationships between and among humans and the environment (Hansen-Ketchum et al., 2009). In tandem with a multitude of related factors influencing health such as social networks, culture, income, and coping strategies (Health Canada, 2002), our ties to the natural environment are entangled in our everyday decisions and practices, as supported (or not) by our collaborations with others, our community environments, and accessible resources.

If we look hard enough, we each have everyday opportunities in research, practice and policy, to use and expand on evidence from studies such as those described previously. We need to draw on and share our ecological knowledge and strengthen our ability to simultaneously nurture health and nature. Ecological knowledge is far too complex to be abandoned to individual pursuit alone; it requires group experiences and memories commensurate with collectively understanding and nurturing the web of life (Goleman, 2009). We need to think long term and understand that sustainable health promotion requires research,

practice, and policies that connect diverse sectors and work together for systemic change.

3.09 Conclusions

Capra (2005) suggests that a sustainable human community "must be designed in such a manner that its ways of life, technologies, and social institutions honor, support, and cooperate with nature's inherent ability to sustain life" (p. xiii). But we do not yet know how health practitioners and decision–makers from diverse sectors use evidence on the health benefits of engaging with nature to inform their work. Do we each, from diverse sectors, consider the need for individuals and families to connect with nature as critical to their health and well being? Furthermore, how do citizens care for and engage with nature in their rural or urban local contexts? We need to explore these questions and collectively mobilize social, political and physical resources for system level change including policy and funding support for participatory community-based studies. Nature-based health promotion is dependent on the connections among citizens, practitioners, researchers, and decision-makers in sharing knowledge and creating ecologically-sound policies, infrastructure, resources, and community and ecosystem conditions that support healthy living for people and the world.

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Chapter Four: Linking Methodology and Methods: Insights from a Participatory Community-based Photographic Study of Nature-based Health Promotion in Rural Nova Scotia

A version of this chapter has been prepared for publication. Hansen-Ketchum. P. & Marck, P. (for submission Fall 2010). Methodological assumptions: The roots of data analysis in a study using photo methods and a community-based participatory design. Prepared for submission to *Qualitative Health Research.*

Given that the research methods we choose as researchers are rooted in our underlying assumptions about reality and knowledge (Hansen-Ketchum & Myrick, 2008), identifying defensible links between methodological principles and research decisions is central to rigorous inquiry (Maggs-Rapport, 2001). In this article, we explore the methodological assumptions that guided data collection and analysis in a participatory community-based study on nature-based health promotion (Hansen-Ketchum, in progress). Participatory community-based research is becoming more and more critical to long term efforts in health (Marck et al., 2010; 2008; Marck, 2006, in press; McMichael, 2006; Minkler & Wallerstein, 2003). Health promotion research, practice, and policy has traversed traditional norms of health education and moved increasingly toward more collaborative and participatory processes for the development of shared knowledge, programs, resources, and policies that together create equitable community-based contexts for healthy living (Boutilier, Mason & Rootman, 1997; Irvine, 2007; McMichael, 2006; PHAC, 2007; Raphael, 2006; Stokols,1996; Teig, 2009; Whitehead, 2001). To this end, we are compelled to exchange knowledge on rigorous processes used in conducting participatory community-based research for community and social change. This paper provides unique insights into issues of rigor by drawing parallels between underlying

methodological rationale and the substantive steps of our study on nature-based health promotion. We begin with a brief overview of the study design and a discussion of critical linkages between its methodological underpinnings and specific components of data collection, data analysis, and knowledge translation that took place during the research. We then provide examples of codes and a select theme that emerged from the use of this research approach. In the final section of our paper, we offer insight and recommendations for designing and implementing iterative participatory research methods with rigor and consistency when conducting community-based inquiry.

4.01 Study Design

The purpose of the study at issue was to generate knowledge about engagement with nature in the promotion of health. Nature-based health promotion in this study was defined as the process of connecting people to their local natural environments to promote health in ecologically-sound ways (Hansen-Ketchum, Marck, & Reutter, 2009). The two overarching research questions were: 1) How do parents of young children care for and engage with nature to promote their individual and family health?; and 2) How do health practitioners and decision-makers use evidence about the health benefits of engaging with nature to design community-based health promotion interventions?

In Phase 1 of this two-phased study, we explored the first research question by using photo narration and photo elicitation interviews and focus groups with 8 parents of young children in a rural community in Atlantic Canada. Parents of young children were selected as an aggregate group of community

citizens because of the potential health impact of their parental role as gatekeeper for the experiences of their own and future generations (McMurray, 2007). In Phase 2, photo elicitation focus groups were employed with 16 local health practitioners and decision-makers to investigate the second research question and explore implications for practice and policy. Dialectical analysis was conducted throughout both phases to critically examine the data for themes, comparing and contrasting for areas of convergence and divergence among participant perspectives and the extant theoretical and research literature. Findings provide direction for community citizens, health practitioners, and policy-makers in realizing engagement with nature in daily life, practice, and policy (Hansen-Ketchum, in press; Hansen-Ketchum et al, under review).

4.02 Methodological Approach

The community-based participatory methodology guiding this project was rooted in a critical realist view of science and influenced by the field of ecological restoration and socio-ecological perspectives on human and environmental health. From a critical realist perspective, developing knowledge is characterized by an ongoing interplay between the subject of inquiry and its broader context, a dialectic that is fueled by truths found in variant perspectives (Bradbury & Reason, 2003; McEvoy & Richards, 2006; Proctor, 1998). Drawing on the work of Dunning (1997), Habermas (1984), Israel et al. (1998), Morrow and Brown (1994), and Thompson (1995), this implies a view of knowledge as value-laden, interpreted through language, and mediated by social, political, cultural, physical, and economic contexts. Accordingly, individual and collective critical reflection

and dialogue were needed during the research to develop knowledge about experiences and to question and learn from related contexts and environmental influences on these experiences. With this approach, ongoing scrutiny of areas of convergence and contradiction within the data, in conjunction with continuous consideration of a priori theory and research, generated a dialectic that fostered a robust and comprehensive understanding of the research problem.

In the field of ecological restoration, scientists, community citizens, practitioners, and policy makers work together to study and support the recovery of ecosystems that have been degraded by such things as pollutants, neglect, and over-development for instance (SER, 2004). By actively participating in restoration research and practice, people develop ethical and practical sensibilities toward local ecosystems as they nurture and sustain natural places in ways that fit local beliefs and practices (Higgs, 2003, 2005, Mills, 1995). Socio-ecological thinking considers the individual, family, community, and system level influences on citizens' experiences (McLeroy, Bibeau, Steckler & Glanz, 1988; McMurray, 2007; Stokols, 1996; Edwards, Mills, & Kothari, 2004). This approach frames health as layered in a complex system of interrelated factors, encouraging researchers to seek understanding of the reciprocal interchanges between humans and the environment that shape, support, and limit healthy living (Richard, Potvin, Kishchuk, Prlic, & Green, 1996; Sallis & Owen, 1997).

Tenets of socio-ecological thinking and forms of participatory engagement that are characteristic of ecological restoration informed the process of building knowledge throughout the research with community citizens, health practitioners,

and decision-makers from diverse sectors. For example, in restoration work, repeat photography is often used to evaluate, monitor, and track the conditions and restoration of places over time. Adapting principles and methods from restoration to the design and conduct of health systems research, Marck and colleagues have developed a restorative approach to study and strengthen the safety and quality of a variety of health care settings (Marck et al., 2006a, 2006b, 2008; 2010; Marck, in press). Patterned throughout a restorative approach in health care are participatory processes of developing communal knowledge, forming ethical commitments towards each other and the places we share, and using what we learn to adapt and grow (Marck et al., 2008; Marck, 2006, in press). These kinds of participatory research processes, which are needed to restore and sustain ecological and human health, are reflected in the design of the current study in terms of engaging parents and other participants in key elements of data collection, data analysis, and knowledge translation throughout the research.

Overall, two deep-seated principles common to socio-ecological thinking, critical realism, and ecological restoration informed this study. First, multiple divergent perspectives from citizens, practitioners, and decision-makers across sectors were considered central to examining the individual and collective experiences and perspectives needed to understand the complexities of nature-based health promotion, considering the unique cultural, social, political, economic, and physical context. Second, actively engaging participants in data collection and analysis throughout the research process in ways that acknowledged reciprocity between human health and nature was viewed as

essential to understanding community-based conditions for connecting with nature. Therefore, the research process was deliberately used to engage participants with each other and with their environment in order to question how we can understand, attend to, and promote human and ecosystem health in everyday life. This participatory research approach was intended to build capacity for change within the community by enabling participants to reflect on their individual experiences as well as discuss and imagine with each other, possibilities for accessible and health promoting opportunities in nature. That is, the research design was intended to support the notion that "humans are dependent on and interconnected with the natural world and can, with the help of science and technology, achieve an ecologically balanced relationship with nature" (Ignatow, 2006, p. 443).

4.03 Methods of Data Collection

In this study, a suite of participatory photographic research methods was used to develop dialogue and narratives that connected participants with their environmental context, with the research, with one another, and with collective experiences in the community. Drawing on earlier work by Rhmetulla, Hall, Higgs, and MacDonald (2002) in ecological restoration, Marck et al. (2006a) and Lockett, Willis and Edwards (2005) in health, Steman et al. (2004) in leisure studies and Beilin (2005) in landscape sociology, methods of participant-led photo walkabouts with photo narration, photo elicitation interviews, and photo elicitation focus groups were adopted to collect and review data.

Participant-led photo walkabouts with photo narration enable inhabitants to take pictures of places and narrate the stories behind those images that have meaning for them in relation to the phenomenon under study (Frith & Harcourt, 2007; Marck et al, 2006a; Smith, Edwards, Varcoe, Martens & Davies, 2006; Stedma et al., 2004). In photo elicitation, pictures are used to facilitate dialogue with participants during an interview or focus group (Harper, 2002; Riley & Manias, 2004). As Harrison (2002) contends, "it is the reflexivity between the image and verbalization which produces the data" (p. 864). Pictures potentially evoke deeper emotions and understandings than solely words (Harper, 2002) and are a means to remember oft forgotten or taken-for-granted experiences (Collier & Collier, 1984). During individual and group dialogue with research participants, accessing such experiences often enables communities to generate the kind of narrative continuity about a place that encourages people to remember and value historical knowledge (what was), reassess the present (what is), and re-imagine with greater creativity different potential futures (what could be) (Marck et al, 2008, 2006; Higgs, 2003).

In Phase 1 photo narration, parent participants were provided with recyclable cameras and invited to take pictures of and narrate stories about their engagement with nature and the barriers and facilitators of the same. Participants took pictures on their own time over a period of two weeks, capturing the many facets and locations of their experiences (see similar approaches in Clark-Ibanez, 2004; Moffit & Robinson Vollman, 2004; Lockett et al, 2005; Wang & Burris, 1997). Figure 4.1 provides a clipping from one participant's photo narration. The

participant's narrative notes were transcribed and attached to associated photographs.

Participant Photo Log	
	a. Brief description of photo: *"Green pepper."* b. Approx location: *"My deck."* c. I took this picture because: *"Gardening allows us to plant, nurture, and consume our own food. The kids love saving seeds to plant and watching things grow."*

Figure 4.1. Photo narration example

Parents used a hand-written photo log or digital recorder to record their reflections at the time each photograph was taken. This real time recording of narrative data was encouraged so that participants' reflections on their experiences were not lost with the passing of time.

After two weeks, the cameras were collected, pictures developed, and photographs and photo narration logs dialectically analyzed for themes. Photo elicitation interviews were then conducted with each participant to critically examine the photographs and experiences. The photo elicitation interviews also offered an opportunity to ask questions that originated from the initial dialectical analysis of photographs and photo logs. This iterative process of data collection and analysis added depth of understanding about participants' experiences and helped modify and expand emergent analytic themes. Researcher recorded photo

elicitation field notes, taken during or immediately following interviews and focus groups were used as data and contributed to the iterative process. In some cases, field notes helped capture participant perspectives and ideas from the informal discussions that sometimes occurred after the interview or focus group in the precious minutes prior to goodbyes. In the days following each interview and focus group and prior to the next, researcher journaling was used to stimulate on-going analytic thinking and to reflect on ways to improve interview and focus group questions, probes, and facilitative processes for the next interview or focus group. The journals and memos were not used as data, but instead were used to document and facilitate an ongoing approach to data collection, data analysis, and knowledge exchange.

Once the photo elicitation interview data were analyzed, parents were invited to participate in one of two 90 minute photo elicitation focus groups with the other parent participants to collectively share and discuss select photos and confirm, disconfirm, refine, and expand emergent themes and their linkages. Also discussed were opportunities for improving community-based access to nature and participant recommendations for practitioners and decision-makers to include in the next phase of the research. Select pictures were projected onto a screen to facilitate the group discussion. The resultant data expanded on the individual photo narration and photo elicitation interview data and enriched the dialectic of collective perspectives. As Kambererlis and Dimitriadis (2005) contend:

> … the synergy and dynamism generated within homogenous collectives often reveals unarticulated norms and normative assumptions. They also take the interpretive process beyond the bounds of individual memory and expression to mine the historically sedimented collective memories and desires…Real-world problems cannot be solved by individuals alone; instead, they require rich and complex funds of communal knowledge and practice. (p. 903).

Once Phase 1 focus group data was analyzed, a matrix was developed to help match substantive themes from parents' experiences to sectors of potential practitioners and decision-makers whose roles and responsibilities would influence interventions for nature-based health promotion in the local community. In Phase 2, photo elicitation focus groups were then employed with people from diverse sectors such as community health, recreation, nutrition, public health, education, community planning and development, daycare centers, community services, municipal sustainable development, and community advocacy groups. Themes and select photos from phase 1 were used to facilitate dialogue on the supports, challenges, and opportunities for designing and implementing health promotion interventions to enable ecologically sound sustainable ways for community citizens to engage with nature. Figure 4.2 (see p. 104) provides an example of a photo elicitation slide that was used to guide the group discussion.

Example of a Photo Elicitation Slide
How do we ensure our local places stay healthy? *How do we encourage people to engage in pro-environmental behaviours?*
 

Figure 4.2. Example of photo elicitation slide used in Phase 2 focus groups

The participatory process of building knowledge using photo narration and photo elicitation protocols in a two-phased design enabled feedback loops with participants to further expand and analyze the data, a process that added to the robustness and usability of the data. Phase 1 enabled the development of knowledge at the individual level and highlighted opportunities and challenges for nature-based health promotion in the local context. In Phase 1, the combination of photo narration and photo elicitation interviews and focus groups provided critical opportunities to probe deeper into the data, question and expand the themes, and prepare for phase two. Table 4.1 (p. 105) provides an overview of Phase 1 and 2 data collection methods and data sources.

Table 4.1
Data Collection Strategies and Data Source

Phase	Research question	Data collection strategies	Data source
1	How do parents of young children care for and engage with nature to promote their individual and family health?	Participant-led photo narrations (PN) of engaging with nature	Photographs and participants' self-reflection logs and/or transcripts of their digitally recorded reflections
		Photo elicitation (PE) in semi-structured interviews	Photographs and PE interview transcripts
		Researcher recorded PE interview field notes	Field notes
		PE with focus groups	Photographs and PE focus group transcripts
		Researcher recorded PE focus group field notes	Field notes
2	How do health practitioners and decision-makers use evidence on the health benefits of engaging with nature to design community-based health promotion interventions?	PE with community focus groups	Select Phase 1 photographs and PE focus group transcripts
		Researcher recorded PE focus group field notes	Field notes
		Phase 2 written summary circulated back to participants for final feedback with key questions for feedback	Written feedback from participants on final summary and key questions

These data collection methods enabled the conduct of on-going dialectical data analysis, an iterative process that draws on Thompson's (1995) "dialectic of interpretation" (p. 51) "which unfolds the connections with the constitution of the subject on the one hand and the constitution of the social world on the other" (p. 215). Our analytic processes are detailed further in the next section.

4.04 Data Analysis

In keeping with assumptions of critical realism and the work of Thompson (1995) and Dunning (1997), dialectical analysis in this study involved putting the codes and themes from the data in ongoing dialogue with each other and with a priori theory to help generate critical knowledge about nature-based health promotion. Figure 4.3 (below) provides a visual depiction of the interrelated processes of dialectical analysis as they progressed within Phases 1 and 2.

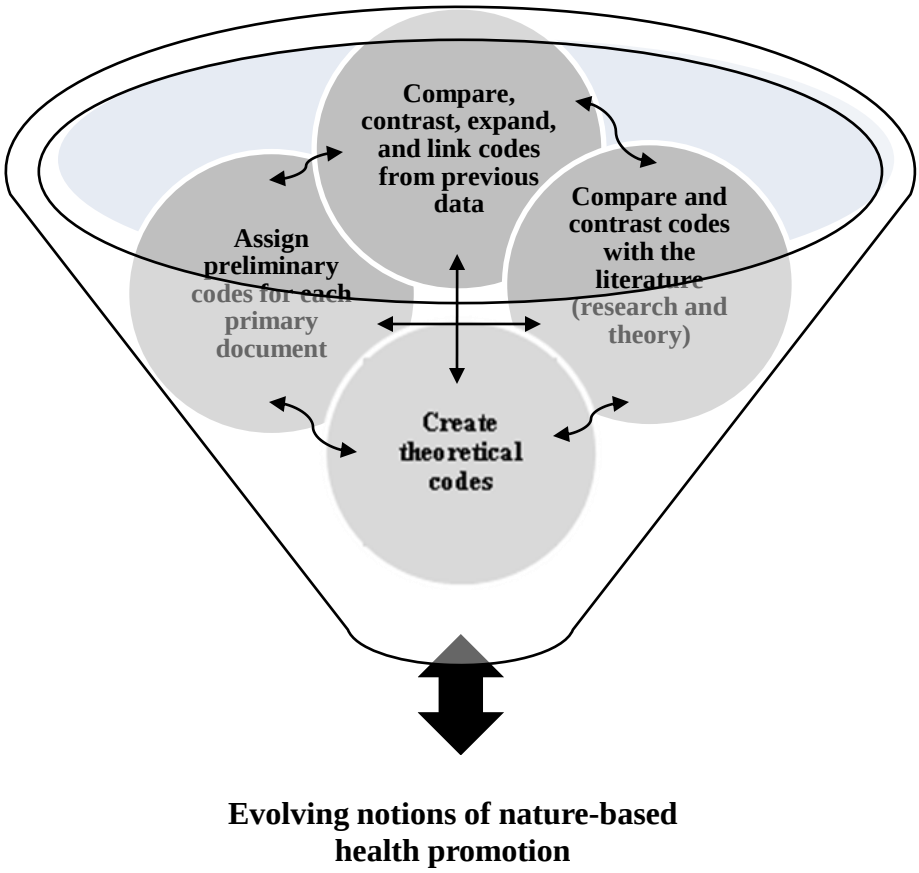

Figure 4.3. Connecting strategies: Iterative process of Phase 1 & 2 dialectical analysis

Photo narration logs, photographs, and photo elicitation interview and focus group transcripts and field notes were analyzed successively, putting each

stage of analysis into dialectic with prior findings to rigorously expand and link codes and generate in-depth knowledge about the phenomenon. As an iterative process, data from the photo narration logs and photographs were analyzed prior to the photo elicitation interviews, which were in turn analyzed prior to the photo elicitation focus groups. Narrative logs, photos, and transcripts were coded line by line, photo by photo, first by hand and then entered into Atlas.ti, a data analysis software program, comparing and contrasting with previous data and the literature. Table 4.2 provides an overview of primary data documents and corresponding analytic techniques.

Table 4.2
Phase 1 and 2 Analytic Techniques

Phase	**Data (primary documents)**	**Analytic techniques**
1	(a)Participants' self-reflection logs or transcripts of their digitally recorded reflections (b)Photographs (c)Photo elicitation interview transcripts and field notes (d)Photo elicitation focus group transcripts and field notes	Substantive and theoretical coding of primary documents (a), (b), (c), (d) to test the validity of the themes and expand the data. On-going researcher journals and memoing
2	(a) Select photographs (from Phase 1) and photo elicitation focus group transcripts and field notes (b)Written feedback from participants on final summary of themes	Substantive and theoretical coding of (a) and (b) with photo elicitation focus group discussions to test and expand the themes. On-going researcher journals and memoing

Codes were assigned to select passages and pictures and eventually categorized at different levels of abstraction. Codes were short concise labels that were considered substantive because they linked directly to photographs and quotations. Although theoretical codes were also linked directly to the data they

usually combined several substantive codes at a more theoretical level of abstraction and reflected and organized patterns in the data that contributed to the development of the final thematic statements and evolving notions of nature-based health promotion. Journaling was conducted manually and memos were documented in the data management software program with both techniques assisting in analysis. The memos and journals contained researcher reflections on the data and helped draw connections among codes. Codes, journals, and memos helped with comparing, contrasting, and managing data segments in order to examine the dialectic and patterns among the data. Examples of substantive and theoretical codes and memos are outlined in Table 4.3.

Table 4.3
Examples of Substantive and Theoretical Codes and Memos

Data management	**Examples**
Substantive codes and memos	**Codes** =nature-based play, health and well-being, learning about nature **Memo**= the photo narrations and photographs captured nature-based play as activities in nature that were not so much for the exercise but rather for the experience in a special outdoor place that contributed to mental, spiritual and physical well being – e.g. walking along a wooded path, children playing in the leaves or with rocks along the beach - consider how this is linked to focal practices described by the work Borgamnn, Higgs, Marck. **Memo**= we need to consider additional interview probes in subsequent photo elicitation interviews. E.g. How does this nature-based activity affect the health of the children, family? Do these activities in nature create values around caring for nature and pro-environmental behaviours? **Memo**= given the significance of being in nature to health and well being, perhaps public health nurses, educators and those involved in school and day care programming would be helpful for Phase 2?

Theoretical codes and memos	**Codes**= Restorative experiences and restorative places **Memo**= the theme of restorative places emerged from discussion on shared places and experiences and opportunities for nature-based health promotion in the community. These codes emerged by collapsing several other codes including the three substantive codes identified above. Substantive codes pointed to the qualities of restorative places and the impact on health and well being, including the need for creating and accessing restorative places for all. **Memo=** need to probe into opportunities for families in the community - camps, curriculum/programming, walking paths, playground areas...lack of access in these contexts are real barriers for people in learning about and experiencing nature **Memo**=need to explore how this converges with or diverges from a priori theory on developing ecological sensibilities.

Drawing on work by Maxwell (2005), Bringer, Halley Johnson, and Brackenridge (2006) and Lewins and Silver (2007), this type of memoing (Table 4.3) was used as a connecting strategy to examine the relationships among codes and the literature. The memoing also acted as a tool for reflecting on methods as the research progressed, resulting in the addition of further probes and revisions to successive interview and focus group protocols as codes developed and questions arose in the data. As data was collected and analyzed, the codes quickly became very complex and rich. As repetition in the codes and depth of data emerged, the dialectic was carried forward into the next step in the research, from phase 1 photo narration to the photo elicitation interviews and focus groups with parents, and then onto the phase 2 focus groups with local practitioners and decision-makers. Table 4.4 streamlines and consolidates the analytic processes of the research to demonstrate the parallels between select analytic steps and corresponding methodological rationale. The parallels reflect the participatory approach to dialectical analysis. The table depicts how the analysis of interview

data expanded on and linked to the photo narration analytic themes which helped shape subsequent focus group protocols and later stages of analysis. The methodological vantage provided critical guide posts for the dynamic analytic approach.

Table 4.4
Parallels Between Select Analytic Steps and Methodological Assumptions

Phase 1 & 2 analytic steps	**Methodological vantage**
(1) Each photo narration transcript and photograph was examined sentence by sentence, photo by photo. Codes were linked to the text and pictures and corresponding reflections recorded. Statements and pictures were also linked to previous codes as needed to expand, challenge, and change them.	(1) These analytic techniques attended to each data set individually but also positioned data bits in dialectic with the whole while rooting the themes in the participant quotations.
(2) Researcher journaling (manual) and memoing (data management software) helped create and modify subsequent photo elicitation interview questions and probes used to clarify codes and themes with participants.	(2) Managing data and tracking the dialectical analysis process created an audit trail while using critical analysis opportunities to prepare for interviews.
(3) During the interview, analytic themes and select photos (findings from the participant's earlier photo narration) were used to facilitate the discussion and expand findings.	(3) Actively including participants in the analysis helped us build knowledge relevant to their experiences.
(4) After the interview, journaling and memoing helped capture the researcher's initial reflections on how the photo narration codes changed or expanded based on participant perspectives.	(4) Knowledge building arose from the convergence and divergence of multiple perspectives and analysis involved comparing and contrasting data in the process of developing themes.
(5) Each interview transcript was read in its entirety and then examined sentence by sentence, highlighting significant statements. Corresponding pictures were re-examined. New codes were linked to the text and pictures. Again, significant statements and pictures were also linked to previous codes.	(5) Dialectical analysis was comprised of analyzing the whole in view of the parts and the parts in view of the whole to acquire a sense of connections to a) other data, and b) the broad socio-ecological context, building from the individual experience. Pictures helped to envision and connect with parents' natural environments to better examine their experiences.

(6) Queries and missing pieces were noted as cues for further exploration in subsequent interviews and focus groups.	(6) Analysis was an iterative process of a) questioning the data, b) developing queries in preparation for other interviews and focus groups. This process created opportunities to probe for deeper insight.
(7) Codes were re-examined, collapsed and combined as needed using corresponding data journals notations, and memos from the photo narration, photo elicitation interviews, and extant literature.	(7) Dialectical analysis entailed cross referencing codes from various sources for in-depth theory building. Both substantive codes and theoretical themes naturally emerged from this process.
(8) Based on findings from the photo narration and interview data, the phase 1 photo elicitation focus group protocol was revised.	(8) Analysis helped us question the data, identify missing pieces, and refine the focus group protocols.
(9) Phase 1 photo elicitation focus groups enabled dialogue on the implications of the findings. Parents were encouraged to share suggestions for potential participants in phase 2, people in practice and policy to whom the findings would be most applicable.	(9) The focus group discussions captured a new layer of data that emerged from the interaction of multiple perspectives. Phase 1 focus groups brought parents together to share and build knowledge together, knowledge that was applicable to the larger community, practice and policy.

The analytic steps in Table 4.4 are numbered for clarity, but should not be misinterpreted as a linear process. These steps were interrelated and over-lapping. For instance, in analyzing the focus group data the researcher would re-visit the photo narration and interview data and look for further evidence to explain or expand new and evolving codes. This analytic cycle continued throughout preliminary analysis of phase 1 parent photo narratives and subsequent refinement of photo elicitation interview protocols, and onwards to the analysis of the parent interview data and refinement of the phase 1 photo elicitation protocols, to the analysis of the parents' photo elicitation data and the refinement of phase 2 photo elicitation focus group protocols, and finally to the analysis of the focus group data from practitioners and decision-makers. In this manner, the visual, narrative,

and interview and focus group texts were all examined and re-examined in light of emerging themes and theoretical insights as the analysis progressed.

4.05 Findings: Characterizing the Development of Themes

In this section we provide examples of data and codes that contributed to the development of a select final analytic theme, *Restorative outdoor places are valued as health promoting*, to demonstrate how themes were rooted in codes from various sources of data and multiple perspectives. The on-going and cyclical dialogue between the data from the photo narrations, photo elicitation interviews, photo elicitation focus groups, and the literature created opportunities to develop and verify preliminary and final analytic themes with participants and to capture the multi-level complexities of nature-based health promotion. For more details on the study findings see Hansen-Ketchum (in press) and Hansen-Ketchum et al. (under review).

In the study, *restorative places* was a code that reflected the participants' favorite local outdoor places, places that provided the context for profound, simple, and health promoting experiences in nature. Restorative places were described as having valuable qualities uniquely defined by each participant but included examples like quiet open spaces with a view of the water, woodland paths, and community gardens. Table 4.5 provides a sketch of exemplar data sources, including a sampling of the literature that helped to inform and develop the select theme.

Table 4.5
Data Characterizing Analytic Theme

Sourcing an analytic theme: Restorative outdoor places are valued as health promoting	
(1) Photo narration data	Examples of related codes: nature-based play, family enrichment, parenting values and lifestyle. Sample participant quotes: *"Just as important as being on our bicycle is where we were riding. This is the only bicycle friendly trail and, fortunately, is quiet, scenic, and natural" (Photo narration)* *"Just being immersed, in nature… is healthy for your mind I think because it reminds you that you're not separate from the environment, you're part of it" (Photo narration)*
(2) Photo elicitation interview data	Examples of related codes: health and well being, access, favorite place, respect for nature. Sample participant quotes: *"Just to take a break and to get out like because when you're in nature it's just, I don't know what the right word is for it, but it's, it takes like the stress away" (Photo elicitation interview)* *"It just takes a step outside to, you know, recharge and ah feel good again and there's no like chores or, or stuff outside" (Photo elicitation interview)*
(3) Photo elicitation focus group data (Phase 1)	Examples of related codes: access, creating shared resources, ecological citizenship Sample participant quotes: *"And then open spaces seem to be important for health and quietness. Noise of birds and water and stuff are OK, but it was the quietness from cars" (Phase 1 group with parents)* *"And so those are the outdoor places that are healthy and health promoting. And then this …is closely related, but it's more about the experience, rather than just the place. But you need the place to experience it" (Phase 1 group with parents)*

(4) Photo elicitation focus group data (Phase 2)	Examples of related codes: cultural shift, ecological health for all, participatory decision- making Sample Participant quotes: *"With the sustainability planning we've been talking about looking at locking off areas that are specific green spaces uh for the communities to be able to use" (Phase 2 focus group with practitioners and decision-makers)* *"I just wanted to add I remember last summer … the outdoor movie [in town field],once a week…I just think of the community spirit that sort of happened as a result of people just being together you know in a nice atmosphere friendly. It's getting dark and the kids still playing and you know and I just thought that that was a real good step forward as far as this is our space and we're going to use it in different ways" (Phase 2 focus group with practitioners and decision-makers)*
(5) Relevant literature	Plenty of literature corroborates data from (1) and (2) above, highlighting the health promoting qualities of natural environments (Cimprich & Ronis 2003; Hartig, et al. 2001; Kingsley &Townsend 2006; Kaplan & Kaplan 1989; Kaplan, 1995, 2001; Kuo 2001; Kuo & Sullivan 2001; Moore et al. 2006; Ogunseitan 2005; Pretty et al. 2005; Schaefer & Higgs 2007; Wells 2000). Yet, data from (3) and (4) raise questions about creating equitable access to restorative places for the health of all. In part, the data point to a cultural problematic where philosophies of humanism and anthrocentrism (Bonnicksen 1988; Eckersly 1992; Ehrenfeld 1981; Kellert, 1993; Engel 1998; Tribe 1972; Midgley, 2007) help us understand a culture that disconnects people from nature. The consumptive character of contemporary technological society is a barrier to understanding, connecting with, and caring about our local environments (Borgmann 1984, 1992, 1999; Higgs, 2003, 2005; Marck, 2000, 2004a, 2004b,2005). Creating access to restorative places requires that sectors such as health, education, transportation, community planning, and community services, work together with community citizens to re-discover the value of nature and create community-based and everyday opportunities to connect with natural places for the promotion of health.

It is evident from this table, that dialectical analysis involved examining multiple perspectives from multiple sources of data to discover truths about the notion of engaging with nature in the promotion of health. Data from the photo narration, photo elicitation interviews, and phase 1 and 2 photo elicitation focus groups worked together with the literature to help us sequentially develop,

characterize, and verify each emergent theme over time. Prior research and theoretical literature enabled us to expand our interpretation of the participants' perspectives, add depth and context to our evolving themes, and broaden implications for nature based health promotion at the individual, family, and community level. Insights from ecological restoration, critical realism, and socio-ecological thinking supported our research decisions and our on-going suite of methods used to seek diverse perspectives and set them in dialogue with one another.

4.06 Discussion

To develop knowledge usable in practice and meaningful to the everyday lives of participants, Israel et al. (1998) suggested that community-based designs should address health from a "positive and ecological perspective" (p. 180), "build on the strengths and resources within the community" (p. 178), "integrate knowledge and action for mutual benefit of all partners" (p. 179), and should, through the process, "disseminate findings and knowledge gained to all partners" (p. 180). The quality of the research design is then, in part, measured in the difference it can make (and/or is making) to the community. In this study, participants themselves were involved in examining their experiences in ways that connected them to one another and their local environment. Participants contributed to the development of findings that were useful to their everyday lives and practice and policy.

Deductive and inductive processes were used to enable a critical dialectical cycle between theory and experience and back again. This cycle

accounted for the theoretical and empirical processes of data collection and analysis, recognizing that neither one is sufficient on its own (Thompson, 1995). Koch and Harrington (1998) argue that studies should be evaluated, in part, on the basis of reflexivity; the degree to which the researcher self-critiques, self-appraises and provides rationale for research activities. To ensure a reflexive and practical outcome, we employed strategies such as journaling and memoing identified in the previous sections, always returning to our methodological rationale for guidance. We also used other strategies such as sequential involvement with participants in the photo narration, photo elicitation interviews, and focus groups to minimize any premature theorizing that can occur from a superficial understanding of participants' experiences (Maxwell, 2005; Huberman & Miles, 1994). During each interview and focus group, participants were also asked for their thoughts on the use of photo methods. Table 4.6 provides examples of participants' written feedback.

Table 4.6
Examples of Participant Feedback on Photo Elicitation Interviews and Focus Group Methods

Research Phase and Quality improvement Questions	**Participant Feedback on Photo Elicitation Interviews and Focus Groups**
Phase 1: What did you think of your interview and/or this focus group?	*"Very interesting people and perspectives. I loved hearing about others/ experiences and seeing their pictures."* *"Very interesting, some great points. Nice to be somewhat 'forced' to think about why you enjoy spending time outdoors/with nature as well as the health promoting and community benefits."* *"Educational, masterminding, brainstorming, open conversation."* *"It was great! Interesting relevant research. I enjoyed it. Thanks."*
Phase 1: What can I do differently to improve the focus groups for phase 1?	*"I think the focus group went well and there was lots of input which I feel is indicative of a well run focus group."* *"Story telling is a great way to share. Let people explain the pics to others."*

Phase 2: What did you think of the focus group?	*"Interesting and wide ranging conversation."* *"It was absolutely wonderful…great to connect with others in the community."* *"Excellent, generated very good discussion and ideas."* *"Interesting conversation, made me think of how our group can enhance opportunities with nature."* *"I appreciated the opportunity to participate in a discussion concerning what I consider to be important/essential issues."*
Phase 2: What are your comments on the use of photographs to help examine the issues?	*"Very appropriate."* *"Great- a picture tells a thousand words."* *"Very effective to elicit ideas and conversation."* *"I'm a visual learner – so great."* *"Helped visualize the defining/concepts brought forth by the first groups."* *"Very powerful, need photographs to make it more personable."* *"Good conversation stimulators."*
Phase 2: What I can do differently to improve the next focus groups?	*"An excellent job letting the group define itself and freely allow the discussion to follow."* *"Everything was great, no suggestions."* *"Nothing because some of the participants led the discussion to areas you had already highlighted."* *"Thought it was well facilitated -conducive to dialogue."*

Participant feedback affirmed the usefulness of the photo methods and provided suggestions for improvement. For instance, one participant suggested that more time be allowed for discussion of each photo during the phase 1 photo elicitation focus groups. In response, more time was allotted for this in subsequent focus group sessions.

The methods of data collection and analysis deliberately created a process of mutual exchange to coalesce and critically examine layers of participant and researcher reflections and perspectives. Asking participants for their input on emergent analytic themes as well as their perspectives on the use of photographic methods provided a vehicle for participatory exchange of knowledge on both the study problem as well as the research methods, all the while enabling validation of on-going analysis. For instance, in phase 1, the photo elicitation interviews

helped to examine and validate interpretations of the participants' photographic logs and the focus groups helped validate the interview themes as well as gather additional data. In phase 2, the focus group participants helped interpret and expand the findings from phase 1 through a practice and policy lens. Further, feedback on the final written summary of the analytic themes from parents, practitioners, and decision-makers helped validate the findings. Similar to the work of Bradbury and Reason (2003), Burgess (2006) and Israel et al. (1998), these feedback loops with participants helped establish the credibility and usability of the findings. The feedback loops assured that the analytic themes, in concert with the on-going processes for data collection and analysis, were appropriate and relevant to participants. Based on feedback on our methods, specific tips to enhance data collection and analysis processes are offered in Table 4.7. These strategies emerged from a combination of researcher and participant reflections throughout the research process.

Table 4.7
Enhancing Methods, Strengthening Rigor

Research Phase	**Suggestions for Method Enhancement**
Photo narration	Several participants commented on pictures they wished they could have taken but were unable to during their 2 weeks of photo narration (due to time, weather, or seasonal restraints for instance). It is important to probe for these types of potentially 'missing' photographs.
Photo elicitation interviews	To help contain and manage the data, each participant could be asked to select 3 or 4 of their most important images to focus on during their interviews instead of using all of the 10-20 photos from the photo narration.
Photo elicitation focus groups (phase 1)	Providing participants with the option of narrating one of their photographs during the focus group session can help them own and engage with the data.
Photo elicitation focus groups (phase 1 & 2)	Slide shows can help facilitate the photo elicitation focus group sessions, pinpointing key themes, photographs, and probes. Minimal and simple wording with prompting questions and corresponding pictures can work best.

Photo elicitation focus groups (phase 1 & 2)	Giving participants questions to reflect on several days prior to the group sessions can help focus dialogue and make the most of the limited time.
Photo elicitation focus groups (phase 1 & 2)	Recruiting for greater numbers of participants per group and fewer focus group sessions can increase the chance for productive dialogue. Seven to nine people per focus group tends to be more effective then smaller numbers, and a better use of time.
Photo elicitation focus groups (phase 1 & 2)	Building on focus group synergies can generate momentum for workshop sessions on specific ideas, interventions, and next steps for change in the community.
Data analysis in general	Conducting hand analysis, in tandem with computer assisted data management software is critical not only because of the risk for technical glitches but also because of the layers of reflections that transpire from both techniques.

In this study, every attempt was made to foster rigor in its design and implementation and, clearly, the fit between methods and methodological rationale was key to justifying our data collection and analytic strategies. Our research strategies invaluably influenced the type of knowledge and theory we generated and enhanced the usability and relevancy of the findings to daily life, practice, and policy. Actively engaging others in the research process can create, or at the very least strengthen community relationships and mobilize resources to sustain on-going awareness and action. Engaging people in the development of knowledge for their own lives and communities can help them overcome barriers, build on strengths, and create change in enduring ways for the promotion of health (Labonte, Woodard, Chad, & Laverack, 2002).

4.07 Conclusion

Methodological assumptions vary with each study and offer critical check points for informed decisions in the design and implementation of research methods. As depicted, our methods of data collection and analysis were influenced by perspectives of critical realism, socio-ecological thinking, and

ecological restoration. Underlying methodological assumptions enabled us to design and implement a consistently rigorous set of check points throughout data collection and analysis. Depicting methodological vantage points is a challenging process that requires in-depth examination of researcher beliefs about reality and knowledge, and involves pulling together insights from diverse theoretical standpoints. Methodological assumptions, developed at the outset of the study, provided on-going guidance and consistency in the refinement of methods and the development of knowledge. As such, the methodological rationale behind the use of methods is a critical layer of rigor in research. Rigor is the iterative process of verifying congruency between design and implementation and validating the findings (Morse, Barret, Mayan, Olson, & Spiers, 2002). Criteria to evaluate rigor should then 'fit' with the epistemological underpinnings of a particular study (Cowling, 1986; Freeman, 2006; Hansen-Ketchum & Myrick, 2008; Morgan, 1983; Madill, Jordan & Shirley, 2000). Articulating how our methodological assumptions informed our methods and openly sharing diverse and specific examples of how this happens is a critical and necessary next step in advancing research methods in health.

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Chapter Five: Engaging with Nature in the Promotion of Health: A Cornerstone to Ecologically Emancipated Communities

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In this chapter I use findings from a community-based study on nature-based health promotion to examine key elements of ecologically emancipated communities, the underlying thrust of this volume. Study findings provide vital insight into how an aggregate group of citizens in rural Atlantic Canada connect with their local and shared outdoor natural places. The knowledge generated from the study fills a knowledge gap on citizen, practitioner, and decision-maker perspectives about engaging with nature to promote health in local contexts. A grassroots perspective on everyday access to nature raises critical and necessary questions about equitable and community-based opportunities and conditions for restorative experiences and ecological citizenship. As such, the findings critically inform a broad notion of ecologically emancipated communities; an inclusive vision of health that links directly to the social, political, and cultural processes that simultaneously influence human and ecosystem health. Ecologically emancipated communities develop when people are able to participate in ecologically sound and everyday ways of promoting human and ecosystem health, commensurate with equitable access to conditions for healthy living.

I begin this chapter with a prologue to nature-based health promotion and ecologically emancipated communities. I follow with an overview of the study design as segue into key findings relating to the analytic themes of restorative

outdoor places, restorative experiences, access to nature, and ecological citizenship, which together add vital insight into ecologically emancipated communities. I explain how these findings link to the notion of ecologically emancipated communities by drawing critical linkages to three related key elements: (1) equitable access to restorative outdoor places; (2) opportunities in ecological citizenship; and (3) communal efforts for change.

5.01 Nature-based Health Promotion and Ecologically Emancipated Communities

Nature-based health promotion is an integrative approach to human and environmental health that unites people with the natural world in diverse and ecologically sound ways (Hansen-Ketchum et al., 2009). Health, then, is generated through individual, collective, and ecologically sound practices that are simultaneously 'good' for people, 'good' for the planet, and relevant to communities. Although human communities are socially defined, they are fundamentally comprised of relationships among people and natural ecosystems in varied and interconnected local and global contexts. As McMurray (2007) points out, communities are

> ecological in that the relationships within the community not only connect people to the community, but give back to the community what it needs to sustain itself, and both sides benefit. Where there is a relatively healthy environment and a sense of communal sharing or civic pride, people tend to work together to make sure their community or society is sustainable (p. 13).

Adding 'emancipation' to this ecological sense of communities helps us recognize that in equitable societies, citizens are not dependent on but rather part of a community system that generates health. In other words, ecologically

emancipated communities are ideally comprised of ever-changing social, cultural, and political processes and conditions that enable people to connect with and care for one another and their built and natural environments and live in equitable, ecologically-sound, and health promoting ways. Similarly, Capra (1996) suggests that sustaining our planetary web of life requires that we nourish the health sustaining relationships within our local and global ecological communities, recognizing that at varying degrees, each of us is intricately tied to everyone and everything else.

By way of contrast, discrimination, racism, and inequitable allocation of resources are examples of social and political processes that contribute to social exclusion, poverty, ill health, and unjust living and working conditions (McGibbon, 2009; Reutter et al., 2006). For instance, lower income groups often carry an inequitable burden of exposure to harmful contaminants for a variety of reasons, including lack of affordable healthy food and housing, lack of access to restorative places, and close proximity to polluted areas; all of which are situated within a broad social, cultural and political context that enables these conditions to happen (Schulz & Nothridge, 2004). In preventing and addressing such health inequities, we need to continue to address the linkages and patterns of associations within and between communities that contribute to unhealthy living conditions.

Current work on the social determinants of health is a means toward addressing some of these inequities, to creating just and equitable societies (Raphael, 2006; CMDH, 2008; Wilkinson & Marmot, 2003) and thus,

ecologically emancipated communities. On the ground level, often missing in these efforts to address the social determinants of health is the "nature matters" connection where the health of surrounding ecosystems and the connections between citizens and nature are fundamental pieces to creating equitable and healthy living conditions that support and sustain health and quality of life.

> Based on the understanding of ecosystems as autopoietic networks and dissipative structures, we can formulate a set of principles of organization that may be identified as the basic principles of ecology and use them as guidelines to build sustainable human communities. The first of those principles is interdependence. All members of an ecological community are interconnected in a vast and intricate network of relationships, the web of life (Capra, 1996, p. 298).

Ideally then, members of ecologically emancipated communities are liberated in the sense that they are able to connect with each other and the world in ways that uphold and protect the rights of humans and their shared ecosystems, where economic gain and development do not trump the health and welfare of all people or the natural environment. Hence, the notion of ecologically emancipated communities can be understood, in part, by examining how people engage with the natural world in ways that are health promoting for themselves, for others, their community, and nature itself. Key analytic themes from a study on nature-based health promotion are useful in understanding a simple yet profound means toward ecologically emancipated communities and are described in more detail following the next section on the study design.

5.02 Study Design: Methodology and Methods

An integrative view of human and environmental health (see Hansen-Ketchum et al., 2009) guided me to examine nature-based health promotion in a

study involving community citizens, practitioners, and decision-makers from diverse sectors[1] to better understand the complexities of the local experience, the barriers and facilitators of engaging with nature in a local community, and the implications for change in practice and policy across such domains as health, education, recreation, community services, environment, and community planning and design. This community-based participatory study was informed by critical realism, socio-ecological thinking, and principles of ecological restoration. From a critical realist perspective, knowledge development is neither subjective nor objective but rather the interplay of variant standpoints (McEvoy, 2006; Proctor, 1998). Community is understood as a socio-ecological system of relationships and influences on people and their environment (McLeroy, 1988; Stokols, 1996; McMurray, 2007). Hence, knowledge relevant and useful to community citizens requires citizen engagement in examining varied perspectives and experiences to address the socio-ecological complexities impacting people and their shared places (Israel et al., 1998; Wallerstein & Duran, 2003; Viswanathan et al., 2004). The principles of ecological restoration (Higgs, 2003, 2005) and its application to health care (Marck, 2004a, 2004b, 2005, 2006; Marck et al., 2006a, 2006b) augment socio-ecological thinking with a focus on the reciprocity between people and their natural environment. A restorative approach guided me in designing and implementing participatory research methods with participants to examine citizen engagement with nature in the promotion of health and the barriers and facilitators to the same.

[1] The sectors involved in the study included: Community Health, Recreation, Nutrition, Public Health, Education, Community Planning and Development, Daycare Centers, Community Services, Municipal Sustainable Development, and various community advocacy groups.

The study consisted of two phases, each guided by a corresponding and overarching research question: (1) How do parents of young children care for and engage with nature to promote their individual and family health?; and (2) How do health practitioners and decision-makers use evidence on the health benefits of engaging with nature to design community-based health promotion interventions? Phase two participants were selected to 'fit' the findings and recommendations from participants in phase one. Findings from phase one were then shared and discussed with phase two participants and used to facilitate discussion on practice and policy.

In phase one, I used photo narration[2] and photo elicitation[3] in interviews and focus groups to examine how eight parents of young children cared for, and engaged with, nature to promote their own and their families' health. Young parents were chosen as an aggregate group of community citizens, particularly because of their gatekeeper role through which "society transmits to individuals its social norms, roles and responsibilities" (McMurray, 2007, p. 108). It was understood that parents' values and lifestyle practices would influence their own and their families' health and have an impact on the environment in which they lived (McMurray, 2007). In phase two, I used photo elicitation via focus groups with 16 community practitioners and decisions makers from public health,

[2] Photo narration in this case was a participant-led method for collecting data. Participants were provided with cameras and over a period of two weeks, photographed and narrated their experiences using a digitally recorded or written log.

[3] Photo elicitation was used to elicit discussions during interviews and focus groups. Select photographs were used, upon participant consent, to facilitate discussions. These types of photo methods have roots in visual anthology and restoration science. For other detailed examples see Marck and Higg's work at http://researchandrestoration.ualberta.ca/index.php and http://bridgland.sunsite.ualberta.ca/

recreation, community services, community planning, education and other sectors to examine how they used evidence on the health benefits of engaging with nature in their work. The two phased approach was useful in examining the individual and systemic features of and possibilities for engagement with nature in the promotion of health. I used an iterative process of dialectical analysis to critically examine the multiple perspectives and analyze for themes (Dunning, 1998; Thompson, 1995). This chapter is based on analysis of citizen perspectives from phase 1 data. It is this data and the interplay of four key emergent themes (refer to Table 5.1) that adjoin to offer profound insights into core elements of ecologically emancipated communities.

Table 5.1
Key analytic themes from a study on nature-based health promotion

Four Key Analytic Themes
1) Restorative outdoor places are valued as health promoting
2) Restorative experiences in nature are simple, profound and enriching
3) Engaging with nature develops ecological citizenship
4) Access to nature is shaped by multi-level barriers and facilitators

5.03 Phase 1 Findings: Overview of Select Analytic Themes

In this section I describe select analytic themes (refer to Table 5.1) derived from a community-based study on nature-based health promotion as groundwork for a discussion on ecologically emancipated communities. Select themes relate to notions of restorative outdoor places, restorative experiences, ecological citizenship, and access to nature, and are rooted in the perspectives and experiences of participants. Therefore, participant quotes are used to exemplify

select data. This overview of themes is a precursor to further discussion on the related discourse in the literature and the relationship to the notion of ecologically emancipated communities.

5.04 Restorative outdoor places are valued as health promoting. Restorative outdoor places were the locations in nature that participants described as having favorite or preferred qualities such as wooded areas, view of the water, open space, and peace and quiet. These restorative places were natural ecosystems that provided conditions for restorative experiences. They connected participants to nature and contributed to a sense of well-being. For instance, one participated accounted that, *"*just as important as being on our bicycle is where we were riding. This is the only bicycle friendly trail and, fortunately, is quiet, scenic, and natural*"* (Photo narration, Participant 1). Another participant described a restorative place as "a place like, if I'm stressed out about something I'll go for a walk up there and it clears my mind, um, makes me refocus on the important things and forget the trivial things life, and ah, it's also a great place" (Interview, Participant 3).

5.05 Restorative experiences in nature are simple, profound and enriching. Restorative experiences for participants were those that occurred in outdoor places and that connected parents and children to the natural world and to each other and that were health promoting. One participant asserted:

> I was saying to my husband that…first of all walking and using some of the trail systems, and just having that time in between, I call it like a segment, so say, if I'm going to the University and, I'm walking to the University, I use that walking time out in nature to just segment and wind down and really get clear and focused for myself mentally and being more focused on my task. So it gives me that clarity. (Interview, Participant 4).

Participants suggested that engaging with nature fostered a sense of mental, spiritual, and physical well being, helped them focus on their priorities, created opportunities to talk and connect with others, and enabled them to understand and appreciate the natural world in simple, profound ways. Outdoor activities such as walking in the woods, field, or beach, picking berries, growing gardens, looking for pollywogs, stacking wood, and sitting by the fire, were examples of restorative experiences that took families away from the stress of work or at-home duties and provided opportunities to talk, imagine, play, and learn.

The activities of engaging with nature were also described as very feasible for families and for the community:

> It shows that we don't always need fancy playground equipment…kids see a pile of dirt as a mountain to climb…and then it turns into a slide…children's imaginations come alive in nature… Fresh air and physical activity usually means the kids will eat a good supper and have a good sleep. (Photo narration, Participant 6)

Nature-based health promotion was depicted in an array of everyday activities that did not pose an economic burden for participants or the community; activities that did not require a membership to a gym, a wellness centre, or other built structures, as stated by a participant during a phase 1 focus group discussion:

> If you're out in nature, there's lots of things that you can do for free that don't cost anything, and I think, you know, to see the health benefits, for maybe lower income, if that was a challenge, you know, for paying for swimming, paying for skating. Those types of things really don't even have to come into effect.

Not only economical for participants, engaging with nature was also described as having minimal, if not positive, environmental impact. Examples of other sustainable practices described by participants included using the clothes line,

walking instead of driving, growing vegetables, buying local food, picking up garbage, visiting local farms. Several participants shared the following examples: "Our whole family helped prepare the soil, plant the seeds, and harvest the vegetables this Fall. Our kids were more likely to eat more vegetables because they helped grow them" (Interview, Participant 6), and

> It's all a mindset right, like in my opinion I'm helping the environment and I'm showing my kids that its everybody's responsibility to take part and clean it up, and, like the beach that we went to um for the bonfire I mean there's tons of broken glass and stuff like that, and you know it's part of our education like you know. (Interview, Participant 4)

5.06 Engaging with nature develops ecological citizenship. Coupled with the analytic themes of restorative places and experiences described in the previous sections, is the notion of developing ecological citizenship. Ecological citizenship is tied to how we connect to, experience, and care for the natural world including our shared outdoor places. It involves the sustainable ways we can protect both the planet and the lives of future generations. Not only did participants point to sustainable practices in describing their engagement with nature as indicated previously, they also considered these practices as important pieces to understanding the need to care for and protect the natural world. As made evident in participant data, engaging with nature in everyday ways fostered ecological citizenship by: (a) developing ecological sensibilities and (b) using and caring for shared resources.

Ecological sensibilities refer to participants' ecological understandings and values about nature and health. Data on participants' restorative experiences in nature provided insight into the interconnection between human and ecosystem

health. As examples in the context of everyday life, ecological sensibilities influenced participants' choice to use 'environmentally friendly' cleaning products, to engage with their children in a fossil hunt on the beach, to share ideas and stories about nature-based health promotion with other families, and to offer recommendations for ecologically sound playgrounds and walking paths. An example of pro-environmental behavior was evident in the following statement:

> But it's just knowing that we live right by a river and ...since we've moved to, to our house, we've changed our cleaning products and dish wash products to vegetable-based…And when I buy those things, I'm thinking of my immediate surroundings at what's going through the drain…So I'm thinking of the ground water and future generations… valuing where you live and feeling a part of what you live, does have an impact… I'm adding globally too…I was reading a label on uh, dishwashing liquid, and it said… if every household changed one bottle of their oil based dish soap to vegetable leaf dish soap, they would have enough oil to heat 5000 homes for a year. (Phase 1, Focus Group 1)

In addition to individual-level experiences in nature and pro-environmental behavior, participants also saw the need to foster equitable access to restorative places for others in the community. For instance, a participant accounted:

> I think at schools too, I look at the elementary school and just because my son is there now but it's so barren…The playground …why don't they have fruit trees, I mean there's apples for the kids, right? You know once they [trees] get bigger and you know a few years down the road… it would provide shade…Which is great because on the sunny days they are totally exposed, right…It would be good learning for them to be part of it, or and then community gardens…I mean to have them in on community gardens just in and around the town, there's lots of space. (Phase1, Focus Group 2)

5.07 Access to nature is shaped by multi-level barriers and facilitators. Access to restorative places and experiences like community gardens or green playgrounds was depicted by a complex array of barriers and facilitators. At the

individual and family level, participants described engagement with nature as influenced by factors such as the individual/family's understanding of, and desire to be in, the natural environment, having restorative places nearby, knowing where to go, having the ability to get there by vehicle, bicycle, or on foot, prior life experiences, having networks of family and friends with similar interests, and a match between the qualities of accessible natural places and the individual/family's desire for solitude, view, or activity. Other barriers included road safety, fear of wildlife, and polluted areas:

> I mean that little stream here in town is disgusting sometimes, you know you're like wow there's a lot of pollution in there, you know and it's up to personally I think you know some of the downtown businesses and, corporate you know…whatever um to do some kind of initiative where people get out and raise money or do clean up crews, right, I mean that also builds pride in the community doesn't it?

The barriers and facilitators to creating equitable community-based access to nature were described by participants as multi-sectoral and related to the need for sharing knowledge and concern about nature-based health promotion among those in practice and policy from varied sectors like education, community planning, transportation, and health while garnering adequate human and financial resources for community-based change. As an example, a participant emphasized the need for knowledge integration and collaboration among diverse sectors to create safe road-side walking conditions, particularly in rural areas:

> I was going to say if like you're building a road, how much more is it to really add a little side slab, right, off the side of the road to build [for walking and biking]. Especially when you're moving dirt. And a lot of times like, they are taking that extra fill and looking for places to dump it because they have nowhere to put it…Yeah, it does take community initiative, for something like that. (Phase 1, Focus Group 1)

Another participant emphasized that nature-based health promotion was economical and not dependent on incumbent incidental funding:

> Sometimes I think places that we are promoting more- rather than look at building some big fancy public 28 million dollar project, I mean, to me like our town and county, it's small, it's relatively small, right? So we have great places already. To promote just the basic trails that are there or beaches or. Potential, but don't realize that that's an option. Simple ideas that don't cost much. You know, close by. And just in conversation I feel that maybe people don't realize that (Phase 1, Focus Group 1)

Community-based access to walking and biking paths was described as an equitable means to connect people with nature to simultaneously promote health and nurture natural ecosystems. Participants suggested opportunities for trails that would enable and encourage children to walk to school in an environment not only free of traffic but also, ideally, full of focal things in nature: a path that meanders by a brook with pollywogs and brimmed with raspberry bushes and apple trees that offer blossoms in the Spring and berries and fruit for foraging in the Fall. Community gardens, farmers' markets with local produce and products, nature-based curricula for children, public health messages about the value of nature, and accessible parks and green space for free play were other examples of accessible community-based resources and opportunities. Taken together, creating equitable access to these types of restorative places and experiences in nature and enabling ecological citizenship are fundamental cornerstones to ecologically emancipated communities.

5.08 Fundamental Elements of Ecologically Emancipated Communities

In this section I return to the notion of ecologically emancipated communities and draw critical connections to three key elements that are derived

from the previously delineated study findings on engaging with nature in the promotion of health: (1) equitable access to restorative outdoor places; (2) opportunities in ecological citizenship, and (3) communal efforts for change. In describing these linkages, I contend that nature-based health promotion is a vital means toward creating ecologically emancipated communities.

5.09 Equitable access to restorative outdoor places. Analytic themes about restorative outdoor places and experiences described in the previous section raise questions about the linkages between health and place. The idea that place affects health is not new (see Collins et al., 2009; Crooks &Andrews, 2009; Fitzpatrick & LaGory, 2000; Frumkin, 2003; Jackson, 1994, Potvin & Hayes, 2007; Eyles, 1985; Speldewinde et al., 2009; Ulriche, 1981) yet the focus in research and practice has largely been on the built environment or the place-based contributors to disease. Yet, there is another body of substantive research that corroborates the restorative qualities of natural environments (Cimprich & Ronis, 2003; Hartig, et al., 2001; Kingsley & Townsend, 2006; Kuo, 2001; Kuo & Sullivan, 2001; Moore et al., 2006; Ogunseitan, 2005; Pretty et al., 2005; Schaefer &Higgs, 2007; Wells, 2000). Other related literature concerns the notion of therapeutic landscapes (see Dunkley, 2009; Gesler, 2003; Gesler et al., 2004; Milligan, Gatrell, & Bingley, 2004; Wakefield &McMullan, 2005; Williams, 1999; Williams, 2008; Wilson, 2003) where the focus is on the health benefits of places, built and natural. However, in contrast to the analytic theme of restorative outdoor places described earlier, overall, the literature on the health effects of places tends to focus on the therapeutic benefits of place for humans rather than

the reciprocal benefits for nature, a critical piece in understanding nature-based health promotion and the broader notion of ecologically emancipated communities.

Philosophies of humanism and anthrocentrism (Bonnicksen, 1988; Eckersly, 1992; Ehrenfeld, 1981; Engel, 1998; Plumwood, 1996; Tribe, 1972) typify the cultural values that contribute to the marginalization of nature. The belief that human needs are separate from the needs of healthy ecosystems still permeates the Western world. Ehrenfeld's (1981) sentinel warnings about lack of ecological foresight in economic and technologic progress are now increasingly evident in the depletion of natural resources, climate change, and changing trajectories of vector borne disease for instance (Routledge & Ayrese, 2005; Watterson et al., 2005). This ecological crisis is a simultaneous crisis of culture, rooted in our inherited values, beliefs, and knowledge, now fast becoming agents for social action and change (Eckersly, 1992). More often than not, what our Western society fails to recognize is that ecological problems are "symptomatic of a fundamental rupture of human emotional and spiritual relationship with the natural world" (Kellert, 1993, p. 46).

Restoring our connections to the natural world may require that we experience moments in nature that liberate us from what Borgmann (1984, p. 35) describes as the "deeply engrained pattern" of technological production and consumption that populates modern life. This cultural problematique is exemplified in the work of Higgs (2000, 2003) and Marck (2000) stemming from Borgmann's philosophy of technology (Borgmann, 1984, 1992, 1999) and is a

barrier to engaging with nature in everyday ways. Participant data from the study on engaging with nature in the promotion of health attests to this technological discourse with participant narratives and photographs highlighting commodities such as the internet, cell phones, and computer games as luring family members away from the natural world, from experiencing the profound restorative benefits of walking a forest path or harvesting garden vegetables. In this sense, nature stands in counterpoise to technology; yet it is the contrast between the two that "heightens rather than denies the radiance of genuine focal things" (Borgmann, 1984, p. 196).

Focal things, like a woods path or campfire, provide opportunities to connect to the simple abundance that yet remains in the precincts of a predominantly technological world (Borgmann, 1984). This imbalance permeates all sectors and, as Marck (2000) indicates, the health system is suffering from a disconnect of both focal practices and communal engagement. Technocracy prevails even in environmental health sectors, where for instance, an orientation to technology for wind and solar energy, although critical to sustainability as well, takes precedence over more focal practices and therefore threatens "our very capacity to develop ecological sensibility" (Bookchin, 2005, p. 409). Higgs (1999, 2005) similarly describes the cultural problematic of using technology to recreate nature in unnatural forms. Disney World's nature excursion is an example; a market-driven and romanticized culmination of technology and culture drawing people further from focal and restorative experiences in our natural world. Yet, dichotomizing technology and nature creates a discourse that awakens a renewed

view of focal practice. The contrast exposes the domination of humans over nature and accentuates the need for restoration of everyday focal practices as central to our lives.

At the other extreme is the lack of ecological thinking evident in various forms of environmentalism. Hay (2002) and Light (2002) describe environmentalism as a political identity that can exclude people and create a biased view of nature. For instance, in extreme environmentalism nature is cast as a romanticized place of maltreatment external to our local communities, treated without deliberation on social, cultural, economic, or political consequences. Further, a claim that some people are closer to nature or more environmental than others takes a privileged view that can only work as yet another barrier to engaging with nature. Contrary to this type of exclusionary view of saving nature in faraway places, participant data from the study on nature-based health promotion reveals diverse sensibilities directed at local outdoor places as influenced by participants' earlier life and learning experiences and everyday opportunities to access nature in the rural context.

In conjunction with understanding the local context and the social and cultural values and norms that influence our relationship with nature is the need to consider the broad determinants of health that have an impact on citizens' ability to engage with nature in everyday feasible and health promoting ways. While there is research to suggest that negative experiences and perceptions of nature may contribute to a lack of interest or even a discomfort with being in nature for some people (Bixler & Floyd, 1997; Milligan & Bingley, 2007) other scholars

suggest that citizens may not be comfortable with or able to engage with nature, participate in local decision-making processes, or adopt certain sustainable lifestyle practices, due to a variety of broad system level influences such as social and cultural values and norms and economic and infrastructure restraints (Melo-Escrishuela, 2008; MacGregor, 2006). This parallels advances in human health promotion and the social determinants of health over the last several decades in a move from addressing individual to system level influences affecting health such as income and social status, social support networks, education, employment and working conditions, physical environments, personal health practices and coping skills, healthy child development, and health services (Epp, 1986; Health Canada, 2002; Rapheal, 2006; CMDH, 2008; WHO, 2003). Much is still to be learned about how these determinants and related multi-level multi-strategy interventions that target individuals, groups, community organizations, institutions, and policy development (Edwards et al., 2004; McLeroy et al., 1988) can contribute to the creation of sustainable environments that support engagement with nature. Although ecological models have been integral to the policy sciences, public health, ecology, and many other disciplines for decades, they are now becoming particularly useful in understanding and framing the complexities of promoting and protecting human and ecosystem health.

5.10 Opportunities for ecological citizenship. Access to and connecting with natural outdoor places can encourage ecological citizenship. Ecological citizenship is place-based (Engel, 1998) and ties to how we connect to, experience, and care for each other and the planet. At varying levels, ecological citizenship

involves acting on the right and responsibility to live sustainability (Bell, 2005; Dobson, 2003, Melo-Escrihula, 2008) in communities where, ideally, people work together to "satisfy its needs and aspirations without diminishing the chances of future generations" (Capra, 2002, p. xiii).

Ecological citizenship is a term that emerged out of the work of a number of environmental and policy scientists in the 1990s. Van Steenbergen (1994) and Christoff (1996) were some of the first to coin the term yet elements of ecological citizenship have been guised in other constructs like 'stewardship', 'green citizenship' (Barry, 1996, 1999), 'environmental ethics (Hay, 2002), 'participatory rights' (Bell, 2005), and 'ecological footprint' (Dobson, 2003). The 1998 Hasting Center Nature Polis and Ethics Project created particular energy and dialogue on ecological citizenship with further evolution in the more recent works of Light (2002, 2003, 2006), Dobson (2003, 2006), Bell (2005) and Bookchin (2005). Moreover, many of the underlying principles of ecological citizenship have been practiced for centuries by indigenous populations who often hold a deep respect for nature and identify their relationship to the earth as a determinant of their well being (Yotti Kingsley, 2009; Adelson, 2006). Aboriginal people have developed and used traditional ecological knowledge to sustain natural ecosystems (Higgs, 2003, 2005). They have long recognized the reciprocal connections between health and nature based on a fundamental understanding that that whatever they do to the earth they do to themselves. As such, many aboriginal peoples have modeled ecological citizenship for centuries in a western world that is only now beginning to realize the wisdom of their teachings.

Engel (1998a) suggests that ecological citizenship occurs when people are concerned about nature and its role in the human experience and when they understand communities as living ecosystems. Yet can someone who does not understand communities as ecosystems as others may know it be an ecological citizen? Is someone who is not concerned about engaging with nature excluded from being an ecological citizen? It is evident in participant data on nature-based health promotion that participants had varying levels of concern about the environment and engaged in a variety of pro-environmental behaviours, from picking up garbage in caring for their favorite outdoor places, to using eco-friendly cleaning products. These types of behaviours were possibly influenced by a broad range of factors such as ability to afford environmentally-friendly products, or participant knowledge about the health-related benefits of such sustainable practices. Multiplicity of citizenship practices reflects inherent and necessary diversity in society. Ecological citizenship, therefore, justifies

> a variety of practices whereby as many people as possible can see the ends of environmental sustainability as part and parcel of their own personal interests or within their broader communal interests. After all, we do not only want environmentalists to recycle and the like, we want everyone to, preferably without having to coerce them to do so (Light, 2002, p. 158).

In this sense, ecological citizenship is not exclusionary because humans are inescapably inhabitants of shared ecosystems and as such, are all ecological citizens in unique and valuably variant ways.

However, to create opportunities that foster ecological citizenship and that enable engagement with nature we must challenge traditional patriarchal systems to better balance power struggles between people and nature (Cuomo, 2001;

Bookchin, 2005; Hay, 2002). From an eco feminist perspective, this means advocating for participatory approaches that embrace diversity of perspectives and practices (Cuomo, 2001; Bookchin, 2005). Fostering ecological citizenship requires that we bring together and trust the pluralistic array of perspectives from multiple sectors and citizens and encourage knowledge building and action at the intersection of views (Engel, 1998b; Latta, 2007).

5.11 Communal efforts for change. Melo-Escrishuela (2008) and Dobson (2003) both advocate for an ecological citizenship that changes how we live and function in the world. Engel (1998a) suggests that society "reshape political and economic structures so as to extend the power of ownership to all persons and to remove the obstacles keeping others from full engagement in civic life (p. S29). Ophlus (1977), too, provides a sentinel call for a polity of scarcity to promote sustainability of life on earth. Ophlus describes a need to "move away from the values of growth, profligacy, and exploitation …toward sufficiency, frugality, and stewardship" (p. 229). This requires a change in mindset and practice for all citizens and sectors within society even from "social justice advocates convinced that ever-greater utilization of natural resources is necessary to improve the living standards of the poor as well as by environmental activists who sometimes seem oblivious to the ways environmental policies and economic inequalities can adversely affect the welfare of people, including their capacity to care for the environment" (Engel,1998b, p. S38).

Nature-based health promotion involves creating everyday and ecologically-sound ways of enabling people to connect with each other and with

nature within their own communities. It is tied to the socio-ecological notion of health promotion; that the health of people and the planet is engendered by people (McMurray, 2007) through intrapersonal, interpersonal, family, community, and political processes (McLeroy et al.,1988, Nutbeam, 1999). As Dobson (2005), Valencia Siaz (2005), Dobson and Bell (2006), and Melo-Escrihuela (2008) suggest, ecological citizenship requires a deep and fundamental cultural shift among citizens and multi-sectoral practitioners and policy makers. Kellert (1993, 1997), Orr (1993) and others (Frumkin, 2001; Gullone, 2000; Kahn, 1999) encourage us to consider these "roots of motivation and understand why and in what circumstances and on what occasions we cherish and protect life" (Wilson, 1984, p. 138).

In remembering our tendencies toward technological and humanistic visage in Western society, our duty to our natural places is as much about the processes for communal engagement and decision-making in nature-based health promotion as it is about the technologies and crisis-oriented action to reducing carbon emissions, slowing climate change, countering environmental degradation, and countering disease. Examining the local experience of nature-based health promotion legitimizes community-level change, rooting it in the experiences and perspectives of those whose lives it affects. It is clear that although engaging with nature has health promoting benefits at the individual level, whole systems change requires that multidisciplinary representatives from various sectors such as health, education, agriculture, natural resources, recreation, and urban planning, adopt participatory approaches and work with each other and community citizens to

strengthen more proactive and everyday opportunities for healthy living for the betterment of long term human and ecosystem health.

5.12 Conclusions

This chapter offers insight into central constructs of nature-based health promotion and raises vital questions about equitable and community-based opportunities and conditions for restorative experiences and ecological citizenship in local settings. Analytic themes of restorative outdoor places, restorative experiences, ecological citizenship, and access to nature are juxtaposed with the literature and linked to three key elements of ecologically emancipated communities: (1) equitable access to restorative outdoor places; (2), opportunities for ecological citizenship, and (3) communal efforts for change. These elements constitute a very broad and inclusive view of ecologically emancipated communities that relate to the social, political, and cultural conditions that enable people to engage with nature in ways that simultaneously influence human and ecosystem health. Using the terms ‘ecologically’ and ‘emancipated’ to describe communities in this way helps us recognize that in equitable societies, citizens are not dependent on but rather part of a community ecosystem that together generates health.

Findings from a community-based study with citizens living in a rural Atlantic Canadian community provide a grassroots perspective on how people can engage with nature in local and everyday settings to nurture their health and well-being. Findings highlight the need for community-based conditions and opportunities that enable people to re-connect with the earth in their everyday

lives and in ways that sustain natural ecosystems and, in turn, sustain people. Ecologically emancipated communities are created when citizens have equitable access to conditions for healthy living and are able to participate in everyday ways of promoting their own and others' health while nurturing the natural environment. By being in nature people can come to know their embedded place in the web of life and use that fundamental knowledge to inform their everyday decisions and actions (Capra, 1996, 2002; Orr, 2004; Smith & William, 1999). As such, restorative places and experiences can help create vital ecological knowledge and sensibilities that foster ecological citizenship as people "come to see their duties to that place as co-extensive with their duties to their fellow citizens" (Light, 2006, p. 154).

Participant data extends the literature on health and place, therapeutic landscapes, restorative experiences and places, health promotion, and ecological citizenship and situates the connections between nature and people within a complex system of influences and relationships. Equitable access to nature as a health resource, opportunities for ecological citizenship, and communal efforts for community-based change are undercurrents to the need for systems thinking in creating just, inclusive, healthy communities. Our system level work in addressing the social determinants of health needs to broaden to include the notion that 'nature matters'. We need to foster the connection between citizens and nature in creating equitable and healthy living conditions that support and sustain health and quality of life. As Engel (1998a) asserts, "neither the

democratic freedom, equality and community nor the ecological well-being of the planet can be realized separately" (p.S31).

Using research to examine the local experiences of citizens, practitioners, and decision-makers from multiple sectors is commensurate with re-positioning science as a tool of dialogue, understanding, and local change rather than a tool for asserting objective certainties. In this sense, it is both the research process in conjunction with the findings that best influences community-based change. Research is an opportunity to create theory and action with participants toward "what could be" (Weaver & Olson, 2006, p. 461). Select findings from a study on engaging with nature in the promotion of health help us envision ways to simultaneously care for the health of people and the planet and in doing so, contribute to ecologically emancipated communities. On-going community-based participatory research is needed to engage citizens, together with practitioners and decision-makers from diverse sectors, and advance knowledge and interventions in the promotion of human and ecosystem health. Creating ecologically emancipated communities requires communal efforts in sharing perspectives and working together to use knowledge, resources, and infrastructure in ecologically sound and sustainable ways, commensurate with creating equitable access to conditions for healthy living and everyday opportunities to care for, and engage with nature in local contexts.

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Chapter Six: Strengthening Access to Restorative Places: Findings from a Participatory Study on Engaging with Nature in the Promotion of Health

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6.01 Introduction

In this paper, we present findings from a two-phase study on the experiences of engaging with nature for parents of young children and the perspectives of practitioners and decision-makers whose work across sectors has the potential to influence everyday access to restorative outdoor places in a rural Atlantic Canada community. While there are many known health benefits to connecting with natural outdoor environments like public green spaces and gardens (Armstrong, 2000; Glover et al., 2005; Kingley & Townsend, 2006; Teig et al., 2009) as well as risks and fears associated with natural settings (Collins & Kearns, 2007; Milligan, 2007), a better understanding of how people engage with nature in their local places, including the opportunities for and barriers to connecting with these potential settings for health promotion, can provide critical insight into possible new directions for contemporary health promotion initiatives. This study provides insight into the role of nature as an everyday resource for health in a rural community in Atlantic Canada. Although the Atlantic provinces are commonly referred to as Canada's 'have not provinces', access to nature in this area may be a very feasible yet over-looked asset and resource for public health.

Walking along a riverside trail or participation in a community vegetable garden are examples of engagement with nature that can enable other healthy behaviours like physical activity and healthy food consumption, factors known to be key to healthy living and the prevention of premature death (Brown & Bell, 2007). Yet, connecting with nature cannot be viewed as an isolated lifestyle behavior left on the shoulders of individual citizens to incorporate into their lives without consideration of access to everyday outdoor places. Lifestyle behaviours are shaped by available resources and social and economic circumstance (Lyons & Langille, 2000), and creating healthy living and working conditions within communities may be thought of as a shared responsibility that, in part, involves strengthening access to restorative outdoor places for all people, regardless of factors such as age, income, ability, and education. However, there are evident research gaps in the literature across fields about citizen narratives and experiences of connecting with nature in everyday places, including the factors that influence the relationship between citizens and their local natural environments. Very few studies have engaged citizens, practitioners, and decision-makers to explore the possibilities for strengthening access to nature within communities as a long term strategy for public health.

To address these knowledge gaps, we shaped a community-based study around two related research questions: (1) How do parents of young children care for and engage with nature to promote their individual and family health?; and (2) How do health practitioners and decision-makers use evidence on the health benefits of engaging with nature to design community-based health promotion

interventions? We begin the paper with background on the notion of nature-based health promotion and then move into an overview of the study methods, followed by a description of the findings and potential implications for research, practice, and policy. We draw particular attention to the notion of norms, the expected ways of doing things in practice and policy, as well as to inter-sectoral governance processes, themes which emerged primarily from analysis of phase two data from practitioners and decision-makers and which provided insight into potential implications for future work in strengthening access to restorative places for community citizens.

6.02 Background

This paper builds on our earlier work on nature-based health promotion (Hansen-Ketchum, Marck, & Reutter, 2009; Hansen-Ketchum & Halpenny, 2010) where integrative views of human and environmental health suggest that there are health-promoting connections between people and the natural world. Nature-based health promotion builds on the work of diverse scholars who have studied notions of health and place, therapeutic landscapes, nature-based therapies, and the health-related outcomes of connecting with nature (see Dunkley, 2009; Ewert et al., 2005; Berger & MacLeod, 2006; Burns, 1998; Hartig et al., 2001; Kingsley & Townsend, 2006; Kuo, 2001; Kuo & Sullivan, 2001; Lundgren, 2004; Milligan et al., 2004; Wakefield & McMullan, 2005; Wells, 2000; Williams, 1999; Wilson, 2003; Ulrich, 1984). In this body of literature, some of the research on restorative places in the fields of environmental psychology, urban planning, and health behavior tended to focus on common outdoor places and their effects on

individual health and well being. Research on therapeutic landscapes and health geography, including recreation and leisure studies, often examined the benefits of specified built and natural places outside the context of everyday living. Another trend in the literature on therapeutic landscapes has been on place-based therapies for healing, often targeting specific health problems like substance abuse (DeVereuil, Wilton, & Kalssen, 2007) and palliative care (Donovan & Williams, 2007) and emotional and relational geographies (Conradson, 2007; Lea, 2008). Still other research has contributed a layer of understanding about the connections between engaging with nature and the potential benefits for both nature and human health. For instance, studies by Carrus et al., (2008), Ewert, Place and Sibthorp (2005) and Hartig, Kaiser, and Bowler (2001) suggest that engaging with nature can encourage people to learn and care about the natural world and to adopt pro-environmental behaviours. Pro-environmental behaviours like walking instead of driving are actions that can have a positive impact on natural ecosystems (Groot & Steg, 2009; Stern, 2000). For instance, driving less can result in a reduction of carbon emissions known to be harmful to the biosphere.

More specifically at the individual level, studies suggest that being in natural environments can restore cognitive attention (Cimprich & Ronis, 2003; Kaplan, 1995; Kaplan & Kaplan, 1989), reduce stress (Parsons et al., 1998; Pretty et al., 2005), lessen symptoms of attention deficit disorder (Kuo & Taylor, 2004; Wells, 2000), encourage physical activity (Hug et al., 2009), enhance quality of life (Ogunseitan, 2005), and strengthen community cohesion (Moore et al., 2006;

Teig, et al. 2009). Despite the evidence that engaging with nature can have positive health benefits, however, places in nature can be scary or unpleasant for some people and therefore not restorative (Collins & Kearns, 2007; Milligan, 2007; Milligan & Bingley, 2007).

Access to restorative places is determined by a mix of individual, environmental, and social factors that work together to influence whether or not people choose to or are able to use nature as a resource to promote their individual and family health. Differential access to nature may result from a combination of individual and family values and practices, income and life circumstances, education, locality, and living and working conditions, all of which are shaped by programs and policies governed by various community and governmental organizations. For example, over the past three decades, a new public health discourse about the problematic medicalization of lifestyle behaviors which places the burden on individuals to change despite socio-economic constraints has illuminated a broad variety of influences on citizens' capacities to engage in healthy living (Epp, 1986; Health Canada , 2002; Rapheal, 2006; WHO, 1986). A related and renewed focus on how places influence health is helping to build a better understanding of everyday contexts that shape social activities and behaviors. Building on resistance to earlier public health initiatives that focused solely on individual behavior change, there is now a trend towards transforming unhealthy places to healthy ones to promote ecosystem and human health (Brown & Duncan, 2002).

Shared outdoor places can connect people locally and globally and can be common grounds for diverse discussions and strategies to promote health. As Larsen and Manderson (2009) argue, health promotion is a political process through which impoverished and unsafe communities can be transformed into healthy places through citizen engagement in decision-making and community and multi-sectoral partnerships for change. Community-based approaches and inter-sectoral efforts in health promotion are not new, and stem in part from seminal reports such as the Epp (1986)Framework *Achieving Health for All* and the *Ottawa Charter for Health Promotion* (WHO, 1986), which are still used across the globe. International conferences and documents on health promotion have since generated recommendations for multi-sectoral initiatives and conditions for health promotion that increasingly focus on creating healthy public policy (WHO, 1988), creating supportive environments for health (WHO, 1991), developing partnerships between all levels of society to address broad influences on health (WHO, 1997b), strengthening health equity and engagement of civil society (WHO, 2000), addressing globalization and human rights (WHO, 2005), and accelerating health and community development (WHO, 2009). Although strong conceptualizations about the environment, health and place, and ecological sustainability are evident in this international work, there remains a disconnect between the importance of supporting ecosystem health and promoting public health. The study findings that we report on in this paper suggest that effective health promotion requires research, practice, and policy aimed at understanding and enabling the creation of healthy local conditions that enable ecological health

for community citizens and their shared ecosystems. These findings provide a starting point towards better understanding the linkages between nature and public health, as rooted in the experiences of participants who considered their engagement in outdoor places to be critical to their health.

6.03 Methodology

Critical realism, socio-ecological thinking, and principles of ecological restoration together formed the methodological roots of this study. Based on a critical realist standpoint (McEvoy 2006; Proctor 1998; Thompson, 1995), multiple perspectives were used to better understand the complexities of engaging with nature. The need for multiple perspectives was also informed by socio-ecological thinking where an understanding of individual level experiences is contextualized with community and policy level perspectives to account for the system of influences on people and health (McLeroy, 1988; Stokols, 1996; McMurray, 2007).The principles of ecological restoration (Higgs 2003, 2005) and its application to health care (Marck et al. 2006a, 2006b) influenced our decision to engage citizens, practitioners, and decision makers from multiple sectors in the use of participant-led photo methods to better understand the connections between people and nature. The principles of ecological restoration informed an innovative research approach that honoured place and participatory methods as cornerstones to understanding and action.

6.04 Setting. The study took place within a town and county in Atlantic Canada. The town and county are comprised of approximately 19,000 inhabitants and roughly 5000 families. Although approximately 80 % of these families live

in the county, the highest concentration of families per kilometer is within the town itself, with a population of about 4200 citizens (Statistics Canada, 2006). Twenty-six percent of the population in the town and county is under the age of 20 and approximately 14% is 65 years or older (Statistics Canada, 2006). The median annual income for families after tax in 2005 was approximately 49,000 Canadian dollars and the employment rate was about 60% for those 25 years and older (Statistic Canada, 2006). The local economy is supported primarily by educational services, retail, trade, health care, agriculture, and fishing. Approximately 98% of the population in the area is primarily English-speaking. Visible minorities constitute approximately 1.8 % of the local population while lower incomes families represent about 7% (Statistics Canada, 2006). The geographical area spans some 1500 square kilometers with ample potential access to nature in terms of numerous coastal beaches, harbors, woodlands, and parks. Winters are characterized by cold weather and moderate snowfall, a season contrasted by warm summers. The data collection primarily occurred in the summer and autumn seasons and the findings therefore primarily reflect participants' experiences during those seasons. The setting was chosen, in part, because of the likelihood that participants would have everyday experiences in nature in a local setting, including experiences which may not have been as accessible in urban areas. The goal of the study was therefore to better understand nature-based health promotion from a sample of people sharing similar outdoor places in the chosen community.

6.05 Sample. Phase one of the study was designed to answer our first research question about how parents of young children engage with nature to promote their individual and family health. The selection of participants was purposive. We chose parents as a sub-group of community citizens because of their gatekeeper role in sharing values and life ways with their children, potentially influencing their own health, the health of their families, and that of future generations (McMurray, 2007). Recruitment occurred in local day cares and local family resource centers used by parents with varied demographics in terms of age, employment, income, and life experiences. Study posters were also placed on community bulletin boards at various locations around the community such as the local library, community centers, farmer's market, local bakeries and grocery stores. Eight parents of young children (n=8) participated in phase one of the study. Consistent with qualitative research methods, data collection stopped when depth of data was evident and repetition in analytic codes was apparent. In qualitative research, the richness of the data rather than the number of participants determines sample size (Maxwell, 2005; Sobel, 2001). The data do not represent the experiences of all community citizens, nor are the results intended to be generalizable. Rather, qualitative data provide a detailed, emic understanding of participants' experiences in the context of this specific place. Participants in phase one of this study were between 31and 43 years of age and all spoke English as their primary language. Although participants had varying levels of education and incomes, all were literate and none were considered to be in the low income bracket. Two participants were males and six were females. All participants were

Caucasian, married and had either one or two young children. Six participants worked full time while the other two worked part time. With one exception, all participants worked outside the home.

In phase two, practitioners and decision-makers (n=16) were recruited to address our second research question about how they use evidence on the health benefits of engaging with nature to inform their work. Participants in phase two were recruited from sectors selected to 'fit' the findings from phase one. For instance, although phase one data was characterized by a variety of experiences in outdoor natural places, participants pointed to a lack of accessible walking trails though nature within the town itself. It was also evident in the community health board's operational plan that the promotion of active living strategies and the creation of walking trails was part of the town's strategic directions. It was then decided to invite representatives from community planning, health, and recreation, who potentially had further insight into this issue. Similarly, other data informed decisions around who else to recruit, and in the end the phase two sample included public health nurses, representatives from the Departments of Community Health and Community Services, educators of undergraduate education students involved in the public school system, staff and directors of local day care centers, members of advocacy groups, and others involved in recreation and community and sustainability planning.

6.06 Limitations. In this study, it was assumed that those who participated in the study came with potential biases toward the value of engaging with nature. From a critical perspective, we acknowledge that this bias limited the acquisition

of data on the negative aspects of engaging with nature, including the risks and fears associated with some places. In addition, the study was situated in a rural area where crimes and fears about nature may be uncommon. We did not recruit participants who were not interested in nature, and so may have missed associated barriers and constraints on engaging with nature. We also acknowledge that in selecting parents of young children as an aggregate group of community citizens, we excluded other groups of people like adolescents, childless families, and elderly people among others. Furthermore, although our recruitment strategies targeted participants with diverse incomes and education, the resultant sample was a relatively homogenous middle class group. As such, we can only speculate as to the relevancy of the findings to people of lower incomes or disadvantaged groups, whose circumstance may pose unique challenges that make it more difficult to engage with nature. In addition, our focus on individual parents in phase one rather than on family units including spouses and children restricts the breadth of family-level data. Future studies will build from these limitations.

6.07 Data collection. In phase one, photo narration and photo elicitation interviews and focus groups were used to examine how eight parents of young children cared for and engaged with nature to promote their own and their families' health. The photographic methods used were adapted from earlier research across fields including restoration science, health, and anthropology (Rhemtulla et al., 2002; Marck et al., 2006a, 2006b; Lockett, Willis & Edwards, 2005; Stedman et al., 2004). Photo narration enabled participants to take photographs and narrate them in a written or digitally recorded log over a two

week period. Photo elicitation involved using participant photos of their nature-based experiences to generate discussions via individual interviews and focus groups. In phase two, photo elicitation focus groups provided an opportunity for progressive review and questioning of phase one images and analytic themes to develop a better understanding of current and potential work in designing and implementing interventions for community engagement with nature.

6.08 Data analysis. An iterative process of dialectical analysis was used throughout both phases to compare and contrast perspectives and to analyze for themes. This process was informed by the work of Dunning (1997) and Thompson (1995) which helped us examine the multiple perspectives that characterized and differentiated related themes. Each new data bit was coded and linked to previous data. Initial analysis resulted in 52 main codes. Codes and themes were constantly analyzed in dialectic with one another and with a priori theory. Emergent analytic themes were discussed with participants during interviews and focus groups to expand and extend the analysis. Once analysis of data from both phases was complete, a summary of themes was sent to all participants for their final feedback. Together, the analytic processes from the two phases enabled an integrative and comprehensive understanding of the connections between the individual and the more systemic complexities of nature-based health promotion. The findings presented in the next section were the result of on-going iterative analysis from both phases, bridging data from community citizens, practitioners, and decision-makers.

6.09 Select Findings

Five key umbrella themes emerged from the data and are summarized in Table 6.1 and discussed below.

Table 6.1
Key Themes from a Study on Nature-based Health Promotion

Five Key Themes
1) Restorative outdoor places are health promoting, profound, and enriching
2) Engaging with nature develops ecological citizenship
3) Access to nature is shaped by multi-level barriers and facilitators
4) Examining norms in practice and policy is an important first step in creating access
5) Inter-sectoral governance can facilitate community-based change for human and ecosystem health

6.10 Restorative outdoor places are health promoting, profound, and enriching. Outdoor environments with access to rivers, beaches, open spaces, gardens, woodlands, and walking trails were examples of restorative places considered important to participants and their families' health and well being. Restorative experiences involved first-hand experience interacting with natural environments. Participants suggested that being in nature helped them to restore a sense of mental, spiritual, and physical well-being while enabling the time and space to connect with family members and friends. For instance, experiences in nature provided opportunities to work or play with other family members while harvesting vegetables, searching for pollywogs, stacking wood, or walking through a field on the way to the grocery store.

In this study, individual and family activities were distinguished from communal activities based on the geographical and social contexts within which these activities took place. For instance, participants described a combination of

activities that occurred either close to home or in shared places like local parks or the public walking trail along the harbor. Table 6.2 provides examples of these activities, categorized according to home or public spaces.

Table 6.2
Participant Examples of Nature-based Activities at Home and in Community Places

Individual and family activities at home	**Individual and communal activities in community places**
Family walks in wooded paths from home	Participating in a local community gardens
Gardening in the backyard	Visiting local provincial day parks and using walking trails and picnic areas
Canoeing in nearby rivers, waterways	Biking/walking a community trail on the edge of town
Playing in piles of leaves under the backyard trees	Visiting farms and public corn mazes
Sitting at a campfire in the backyard	Visiting local public beaches
Skating on a nearby pond	Walking along rural roads, through forested areas

The parents who worked full time outside the home suggested that there were few opportunities to access nature during the work day, so appreciated the chance to engage in nature at home or in the local community after hours. Although several participants described the need for organized community events in green spaces, all participants expressed the importance of everyday access to outdoor natural places outside of organized events so that they could engage with nature at times that 'fit' their busy schedules and in ways that satisfied their need for solitude and peace. All but one parent suggested that organized events do not offer the mental and spiritual health benefits of less structured and more solitary time in nature.

Photograph A below presents a child's art work captured by a participant during the family's visit to a local beach. Parents expressed that unstructured

activity like this helps to foster creativity and independence, contrasting the more technology-driven day-to-day activities that seemed to disconnect people from the natural world.

Figure 6.1. Photograph A, a child's unstructured creativity on a public beach

Similarly, a parent stated,

> I think we live in such a busy, technologically-focused, stressed world that people need to take breaks and get away from it all. Engaging with nature helps with stress, aids in refocusing on positive aspects or just allowing one to focus inward. These natural settings are restorative, peaceful and for me, a necessity. (Parent, Final Feedback)

Another parent described his favorite restorative place as "the top of the world" (Photograph B), a hilltop overlooking the local area and accessible by foot from his home. His unstructured time in this place with his daughter helped him feel relaxed and peaceful and connected to the natural world.

Figure 6.2. Photograph B, a favorite place away from the stress of the modern world

Restorative places like this one were most commonly described by participants as contexts for free play, physical activity and a welcome change from the fast-paced modern world.

Seven of the eight parents also remarked on the health benefits of having their children grow and harvest vegetables and fruit. One parent noted that "I don't think they ate beans before they started to see where they came from". Notably, six of these parents had either their own back yard garden or access to berry bushes, and one had a plot in a community garden. Their access to garden resources notably influenced their ability to see the connections to healthy eating. Further, their own socio-economic resources and/or the community's provisions for a communal garden afforded them the opportunity to garden.

All participants depicted the positive linkages between health and their experiences in nature, and there were few negative perceptions of nature. Table 6.3 provides examples of participants' perceptions of the health-related benefits in the data alongside their perceived risks. Although all parents described benefits

1-5, only three participants depicted risks. Participants identified risks associated with the loitering and drug dealing that was known to happen in some of the more secluded and wooded areas in the community. Safety risks were also associated with a lack of lighting on wooded paths and rural roads, posing challenges to getting out in nature in the evening at certain times of the year. Several other participants living in more rural areas expressed fear of wildlife such as bears. This fear deterred them from visiting some outdoor places in the Spring when the bears were most active, and influenced their choices to go to other less wooded areas.

Table 6.3
Examples of the Participants' Perceived Health-related Benefits and Risks Associated with Being in Nature

Health-related benefits	**Risks**
1. Sense of well-being and peacefulness 2. Sense of togetherness among family members and friends 3. Stress release 4. Creativity 5. Physical activity 6. Access to and consumption of nutritious foods	1. Safety: Hang outs for drug dealing 2. Safety: Lack of lighting on wooded paths and rural roads 3. Safety: Fear of wildlife

In part, it is assumed that the lack of data on risks was a function of both the study questions and the sample of parents, who already felt strongly about the value of being in nature. Further, these participants already had years of experience visiting places in nature and were comfortable in the local setting. Participants were also part of a rural community with low crime rates and networks of citizens who knew one another.

6.11 Engaging with nature develops ecological citizenship. It was evident in the data that engaging with nature provided participants with an

opportunity not only to restore their health but also to learn about the natural world and develop a sense of responsibility towards outdoor places. Participant data showed patterns of ecological sensibility, the notion that being in nature helped to foster an innate understanding of the natural world and a desire to care for and protect it. As one participant recounted, "being there and valuing where you live and feeling a part of where you live does have an impact" (Phase 1 Focus Group).

Participant experiences reflected sustainable ways of protecting the long term health of restorative places and shared ecosystems. Participants suggested that most of their experiences in restorative places were not only economical for themselves and required no membership fees but also had minimal environmental impact and enabled pro-environmental behaviours like walking or biking instead of driving, using their own clothesline (see Photograph C), growing or harvesting local produce, and picking up garbage in shared outdoor places.

Figure 6.3. Photograph C, a private clothes line as an economical and pro-environmental strategy

One mother drew the connections between engaging with nature and ecological citizenship when she discussed walking in nature and using a community garden, stating:

> It's interesting to see how many people partake in such easy lifestyle shifts. It is a shift. When we started walking, we thought, OK, because it's actually quicker, it's quicker for us to walk the kids to school, than get in the car. But we were in the habit of driving the car. And it is a habit and now, we're in the habit of walking.... And same with organics, you know, it took us, a slow integration of, you know, buying some organic and then growing some organic. It was just these little incorporations, slowly. (Parent Interview)

Despite these examples, it is uncertain how participants' education, income, social networks and cultural values enabled or constrained ecological citizenship. For instance, the data suggested that although all participants valued nature, they did not share the same level of pro-environmental behaviours. For example, participant demographics suggested that higher income and education may have influenced several participants' ability to afford organic food and design 'environmentally-friendly' homes. Although it may be argued that all persons are ecological citizens to greater or lesser degrees by virtue of being human and sharing natural ecosystems, it is equally arguable that local conditions and access to socio-economic resources influence citizens' desire and ability to demonstrate ecological citizenship.

6.12 Access to nature is shaped by multi-level barriers and facilitators.

Parents, practitioners, and decision-makers provided insight into diverse barriers and facilitators to everyday engagement with nature that, once addressed, could possibly enhance the quality of life and health for people in the local community. For instance, lack of walking trails and unsafe roadways were barriers to active

transportation, conditions that could enable people to walk instead of drive. Table 6.4 outlines main categories of barriers and facilitators to accessing restorative places exemplified by participant quotes from the data.

Table 6.4
Examples of Barriers and Facilitators to Accessing Nature

Factors Influencing Access	**Facilitators: Examples of Participant Quotes**	**Barriers: Examples of Participant Quotes**
Nearby nature	*And some of the students built it [community garden] …they gave us all the equipment to do that. It was really neat. (Parent, Interview)*	*Yeah there aren't even walking paths really and that's unfortunate 'cause we have a beautiful town with rivers running through it (Public Health Nurse, Phase 2 Focus Group)*
Day care and school places and programming	*The daycare does little science classes on hibernating for instance and my daughter eats it up and this has a big impact on her and how she understands and cares about the world around her (Parent, Interview)*	*I think at schools too, I look at the elementary school and just because my son is there now but it's so barren…. Why don't they have fruit trees, I mean there's apples for the kids, right? You know once they get bigger…would provide shade. It would be good learning for them to be part of it.… (Parent, Phase 1 Focus Group)*
Community trail systems and connectivity	*We sometimes get around this way, [child] strapped into the bicycle seat. It is a more direct way for him to engage in his environment, slower pace and exposed to nature. (Parent, Interview)*	*But I know when I was on maternity leave… I often regretted that I couldn't just take my stroller out and go for a walk because I have to make a concerted effort to do that somewhere else. (Parent, Interview)*
Safety and quality of outdoor places	*I have been coming here [to remote beach] since I was a kid and now I bring my children here. It is safe and peaceful and I'm happiest in places like this (Parent, Interview)*	*We come here at least once per week so our daughter can throw rocks into the water. Unfortunately, if the tide is low there is a lot of broken glass which is covered during high tide. This is a great place to swim but not from the beach. (Parent, Photo narration)*

Awareness of restorative places	*Not many people know those trails are here… Great place for exercise. (Parent, Photo narration)*	*I think the perspective for newcomers and even the families [who]have been here for a long time is that there are not a lot of natural spaces. (Representative, Department of Recreation, Phase 2 Focus Group)*
Technology and norms	*But every time we, we get into conversations around [the community] we speak a lot about indoor or things that are tied to schools or activities but they're recreational activities and whereas I kind of make a distinction between recreational and nature based. Nature based is purely just out there for the fun of it… it may just be interacting and it's more spirituality the mind and physical all three together. (Community Services, Phase 2 Focus Group)*	*I think that we kind of structure things a bit too much these days…kids can't walk to school because of safety issues etc., etc. but it's because we're structuring everything. We're structuring their activities. … That changes the whole idea of interaction with nature and interaction with nature should be natural. (Representative, Sustainability Planning, Phase 2 Focus Group)*

Parents in the study were able to access many restorative places in the community perhaps in part because they had the social support and resources to get to there. For instance, participants described being able to pick produce from their family farms, stroll through a nearby wooded paths with friends, or have a family picnics at a local beach. These opportunities in nature did not always reflect the need for infrastructure or development, but rather, illustrated existing possibilities for people to re-connect with the outdoor places that already exist in their community. Photograph D provides an image of backyard playground opportunities for a family, as an example of a place for free play and exploration, a place where hands-on learning and a love of the natural environment can develop.

Figure 6.4. Photograph D, a favorite nearby and economical play ground

Although nature was abundant within the study setting, it was evident that some common outdoor places could be cleaned up and made more accessible for other citizens. For instance, participants from each phase suggested that play areas around local schools could be better used to grow fruit trees and edible gardens. This could happen in tandem with day care and school programming, encouraging children to engage with nature in an experiential way, enabling free play in conjunction with hands-on learning activities in the outdoors.

Lack of trails through the town and along rural roads in the county were also described as hindering everyday access to restorative places for parents in the study. They identified the need for community walking trails to better enable people to walk or bike instead of drive. Yet, past efforts to create community walking trails were described as fraught with property owner discord about people walking in their back yards. Although there were no solutions identified for this problem, participants suggested that ecologically sound paths through nature could strategically connect to locations like schools and stores, which would

enable individuals and families to safely enjoy nature, get exercise, and reduce vehicular driving at the same time. Participants advocated for walking paths in nature that were safe from traffic, child and stroller friendly, and adequately lighted. In contrast, photograph E (below) depicts one parent's experience of trying to walk her child in a stroller along the shoulder of a rural road, an experience met with difficulty and risk due to the narrow space, rough ground, and traffic.

Figure 6.5. Photograph E, unsafe shoulders for walking and biking

A lack of awareness about the reciprocity between nature and health, as well as not knowing where to go or what to do in nature, were other barriers that participants discussed. For example, participants found it difficult to acquire information on the types and locations of restorative places in the community. They indicated that even simple suggestions and reminders for free play activities in the outdoors could encourage people to re-think the notion of nature as a resource for health, and help them to consider options for engaging in free play in their own backyards. This type of information could be relayed by public health

nurses in their individual interactions with patients and community members or through health promotion sessions and educational in-services for businesses, teachers, and care givers. One participant narrated photograph F (below) of a walking trail not readily known about or used by many community members. Participants described how pictures like this one could even be used as a tool for sharing information about these opportunities with others.

Figure 6.6. Photograph F, heading to a walking path not known to many community members

Participants also discussed how increasing awareness and encouraging people to engage with nature was complicated by the technology and cultural norms that disconnected people from the natural world. As one participant revealed, "We don't value those leisure opportunities. You know, we don't see that as productive use of time in our culture" (Community Health, Phase 2 Focus Group). Another stated:

> We seem to be functioning more as a result of convenience so, for example, you need to get money out you go to a bank machine, you go through a drive-through bank machine because it's been created for you. (Community Planning, Phase 2 Focus Group)

In reflecting on the final summary of themes and considering the need for improving community understanding and valuing of nature-based health promotion, another practitioner wrote:

> …Nature based health promotion and ecological citizenship required active facilitation on the part of parents, teachers, community leaders, positive media images, etc. Ecological citizenship was highlighted as a value we needed to "sell" to others; however, often this value was not given the priority it deserves. (Educator, Final Summary)

In describing their access to restorative places participants provided an array of recommendations including the creation of community walking trails in nature and the need for increased awareness among citizens and sectors about the value of natural ecosystems. Although these recommendations could be fundamental starting points for change within the community, they require further investigation. Moreover, potential change in the community could be complicated by other pressing issues in public health and other sectors, where efforts to reduce rates of cardiovascular disease, cancer, and infectious disease compete for limited funding and resources available within the community. Several participants indicated that even in the education sector, school board policies do not support adequate human and physical resources for physical education and outdoor learning. At the provincial level, health promotion initiatives such as the Active Kids Healthy Kids strategy and the Pathways for People initiative encourage physical activity through the development of programs for active living within communities, yet there seems to be little attention given to the role of everyday access to nature and green space. Although good work has been done in connecting children to recreational activities in communities and subsidizing costs

for some families, the focus seems to remain on programming. Given these types of broad structural constraints, participants pointed to advocacy and volunteer groups as also having an important role in creating access to natural environments. Community groups were described as being able to garner public support to help provide resources within the community. Initiatives such as the development of community gardens and family outreach programs had resulted from volunteer and advocacy work. Creating access to nature was not therefore considered a job for one person or even one sector, but instead viewed as a process of garnering support and participation from colleagues in many sectors alongside community citizens.

6.13 Examining norms in practice and policy is an important first step in creating access. To enable access to restorative places, participants in phase two described the need to first re-visit norms in practice and policy. Norms in this case were the often taken-for-granted, expected ways of doing things influenced by the social, cultural, political, and economic context. Examples included costly programming and service delivery, and working in silos of sectors and organizations. More specifically, one practitioner re-imagined new ways of providing community services based on her understanding of the value of restorative outdoor places and experiences. She discussed the need to encourage families to connect in ways that were sustainable and healthy for them and that did not require financial resources. She stated:

> It is fine, you know, to create activities to go bowling or whatever, but what you want to do is create this bond with the family and the child. Restore that piece…and what can we do in the community? What can we

> do with an activity together that might not cost money but still be a very valuable thing… (Community Services, Phase 2 Focus Group).

Further, access to shared outdoor places was considered key to health promotion. As one decision-maker remarked:

> …just in intervention, because we could go out and try and teach and put as many programs as we wanted to but until the environment is there for people to actually go out and interact with nature, they won't be able to (Sustainability Planning, Phase 2 Focus Group).

Practitioners and decision-makers in the study emphasized the value of nature-based restorative experiences and the importance of creating ecologically sound access to nature, but articulated that it was not the norm in many sectors to consider options for health promotion, let alone plan for nature-based health promotion or work with others in this area. For instance, in discussing a recent relocation of offices without employee consultation, one participant recounted no longer being able to walk to work, stating:

> …So all those people are going to be getting in their car and driving…to our offices that we all used to walk to. So this is the government doing a favour for us. …those kinds of things aren't really taken into consideration, unfortunately because they're just not one of the priorities they have to consider. (Community Planning, Phase 2 Focus Group)

This inattention to health promotion was complicated by the perpetuation of current silos of work within various sectors. For instance, the departments of transportation, recreation, community health, and education were described as rarely connecting or collaborating. A renewal of highway infrastructure occurred in many areas, and yet the shoulders of many rural roads and bridges were not designed for modes of active transportation like walking and biking. New schools

were created in places with very little access to walking trails for use to and from school. One decision-maker described this barrier when he stated:

> Um other barriers…that I jotted down. School board requirements for siting of schools means that they're always put somewhere where no one will walk to them. … Because they have to be so large now that they end up on the outskirts somewhere. Um and that's I think that needs to be looked at. (Community Planning, Phase 2 Focus Group)

Another participant who reflected on the final summary of this theme voiced a hope for change when she wrote:

> I feel it reflects what was discussed in the focus group. We live in a small town where we seem to continue to do things because they are just the way they have always been done. I think we are seeing though the beginnings of this required shift. People are starting to work together across silos particularly around the broad area of sustainability which crosses a number of sectors, capacities, and needs. (Sustainability Planning, Phase 2 Focus Group)

The burgeoning shift noted in this participant's narrative was also reflected in examples of recent initiatives within the community, such as the development of recreational summer day camps and day care programming tailored to learning about and engaging with the earth. The community has also seen shifts toward municipal planning requirements for more green space, the development of community vegetable gardens, and funded positions in sustainability planning and infrastructure development- initiatives that, according to participants, respond to the community's need for access to nature. One participant suggested, "…there's a lot we can [do] and it brings us back to many of our own cultures who really are healing ones from nature" (Community Planning, Phase 2 Focus Group).

These shifts inspire hope that people are beginning to think about 'health' and 'nature' together within their personal and professional lives. As one

participant pointed out, continuing to examine and re-design norms in practice and policy is a vital next step towards strengthening access to restorative places and thereby promoting health:

> …many individuals were unaware of the health benefits of nature. Perhaps their economic, social or cultural experiences to date had not given them opportunities to appreciate nature's restorative value. Access to nature needs to be equally available to all regardless of individual or family circumstances. Critically examining the norms in practice and policy could cause local government officials and others in authority to create fairer and more inclusive policies and practices. (Educator, Final Feedback)

6.14 Inter-sectoral governance can facilitate community-based change for human and ecosystem health. In this research, inter-sectoral governance is defined as the participatory and communal process of creating ecologically-sound health promoting practices and policies across sectors to generate on-going change within the community. This definition emerged from data on the cultural shifts that participants identified as necessary to adequately attend to human and ecosystem health. These shifts were linked to participants' recommendations for ecologically-sound decision-making tools that are responsive to environmental assets, human and environmental health, and that encourage inter-sectoral and citizen input and engagement in the process of change. In participants' words, the theme of inter-sectoral governance was described as ideally an inclusive and shared process that would seek voices, ownership, and involvement from diverse sectors and citizens (see Table 6.5, p. 193).

Table 6.5
Inter-sectoral Processes for Human and Ecosystem Health: Examples from the Data

Inter-sectoral processes	**Data quotes**
Collaborating between sectors and dove tailing initiatives	*…there are so many opportunities to increase opportunities for nature based health promotion. We need to capitalize on these opportunities and coordinate across sectors for meaningful change. It is also critical to meaningfully engage those who have barriers to accessing these opportunities. (Final Feedback, Decision-maker)* *I was going to say if like you're building a road how much more is it to really add a little side slab, right, off the side of the road. Especially when you're moving dirt And a lot of times like, they are taking that extra fill and looking for places to dump it because they have nowhere to put it. Yeah, exactly, yeah, yeah, it does take community initiative, for something like that. (Phase1 Focus Group)*
Cultural shifts: Committing to human and ecosystem health	*How many of us actually walk to work if we live and work in town... Um it's really surprising. It's staggering… Even I see my own culture shift, because of the masses you kind of go with it and it just becomes a norm and then it just becomes a habit and you have to reverse it. So I think it's really key that we figure out an approach for adults as well as for kids (Phase 2 Focus Group)* *In a structured way I'm writing a plan that will allow people to keep hens in their backyards. Possibly goats. It's, it's useful. But it's structured. We need structure [to create unstructured opportunities in nature]. Hens. (Phase 2 Focus Group)*

Creating and using ecologically sound decision-making tools	*…I think that [health impact assessments] are something that, from a health promoting policy, that could remove barriers. . It's no different than environmental[impact assessments]….streamline it and, and consider those things exactly (Phase 2, Focus Group2)* *Well just from a health perspective again I think if we reinforce the value [of engaging with nature] and when we're looking at the cost of things and limited resources again having an impact on the, the so-called bottom line and we're talking to politicians around where our resources should be allocated…We don't need a lot of techniques or types of equipment or whatever. (Phase 2 Focus group)*
Strengthening environmental assets and infrastructure	*…We could go out and try and teach and put as many programs as we wanted to but until the environment is there for people to actually go out and interact with nature, they won't be able to (Phase 2 Focus Group).* *That's probably why we lost it [connection to nature] because we didn't have plans or things in place to protect those things. And then development happened you lose all those pieces and so we do need that thoughtfulness given to you know how we do use our spaces ….. (Phase 2, Focus Group)*
Engaging and connecting citizens	*…We've been involved with the ….network in community impact assessments tools and, and it's, it's really a process where you connect with people in the community,* *There have been a few plans that have already been designed… the idea is to try to get…everybody[to] look at it jointly. Um it's positive.*

In contrast to the notion of inter-sectoral governance, participants articulated that it was uncommon for many sectors, such as the department of transportation, community services, and education, to consider health and nature in the process of making decisions and intervening at the organizational and

community level. Participants suggested that in part, this was due to a society where technologies, built environments, and modern conveniences were commonly valued over more traditional yet sustainable practices like growing local produce and using walking trails in lieu of vehicular driving. Countering these tendencies may mean creating future opportunities for dialogue about the complex interrelationships between economic, environmental, and social factors to discern what can be done and how to best intervene in ways that are ecologically-sound: 'good' for people and 'good' for the natural world. To this end, one practitioner recommended the use of decision-making tools that incorporated processes and indicators of ecosystem and human health and told of the recent transportation infrastructure renewal project in the area:

> …If you were going forward with that process, there are very quick tools…How will this affect recreation or is there potential for it to? …if I am forced to think about those things or required to, then it just makes you broaden your decision-making (Community Health, Phase 2 Focus Group)

Ecologically-sound decision-making tools were deemed important but also seen as futile unless decisions and actions were supported by adequate human and financial resources. Participants indicated that resources for community-based initiatives were often difficult to secure and sustain, and to make matters worse, the collaboration and multi-sectoral work which was needed to move forward was not occurring to date. Yet, building on the need for ecologically-sound decision-making processes and infrastructure, participants discussed the significance of using citizen groups for change, citing examples of other communities where environmental change occurred and where resources were created with little formal funding or programming. One decision-maker recounted:

> …as a community they have not waited or depended on infrastructure funding to, to do some of the things that we're talking about…it is kind-of going back to the ways things were done historically by having a weekend where people are providing food and other people are building… (Community Planning, Phase 2 Focus Group)

Similarly, another mentioned that "sometimes we need to look outside that funding pot and find other ways" (Sustainability Planning, Phase 2 Focus Group). Other ways pointed to an engaged civil society. In a final reflection on the notion of inter-sectoral governance, a practitioner wrote:

> Many positive initiatives were currently taking place …, but for these to take hold, all sectors of the population needed to be involved. The next priority after examining current practices and policies would be to rewrite or create new mandates and mission statements. The idea was that we all needed to start caring about our environment together…(Educator, Final Feedback)

Although this sounds ideal, it remains unclear who would be accountable to and monitor changes across sectors, or how communities would determine if changes were sufficiently worthwhile for people and community health in relation to other valued community goals.

6.15 Discussion

In this study, knowledge about engaging with nature in a local context developed analytically by using participatory photo methods and dialectical analysis to examine participant experiences in nature and to question the broader influences that shaped these experiences. The findings helped us to better understand possible underlying links and interactions between people's everyday lives, restorative environments, and health promotion. Although the findings were not representative of the experiences of all citizens in the community and were constrained by the type and demographics of the sample, it was evident from

the data that restorative places and experiences were enriching, profound, and health enhancing and that access to these experiences was influenced by a complex array of factors.

The notion of restorative outdoor places in this study highlighted the significance of direct experience in nature and possibilities for optimizing health in local contexts. A nearby wooded path, a community garden, or the river's edge were all examples of places that were said to restore a sense of peace, comfort, and mental and spiritual balance, promote social connectivity, and present opportunities for physical activity and imaginative free play.

According to Kaplan and Kaplan (1989) and Kaplan's (1995) attention restoration theory, interaction with the natural environment has potential to promote cognitive attention and thereby enhance intrapersonal, interpersonal and social functioning. The theory argues that an experience in nature is most likely to enhance mental functioning when it psychologically or geographically distances people from stressful places, when qualities of the environment are fascinating and compatible with one's preferences, and when there is regular and significant amounts of time spent in the natural environment. Similarly, participants in our study discussed places in nature that provided them with a sense of being away from the stresses of modern life and as favorite places that, depending on participants' preferences, provided a chance for solitude, unstructured play, a view of the water, and quietness, among other qualities and characteristics.

Although not as prevalent in our data, it is also clear that perceived risks and fears can influence decisions to connect with nature. For instance, Collins and Kearns' (2007) study provides insight into the risks of engaging in outdoor places like beaches where prolonged exposure to ultraviolet rays increase risks for skin cancer. Media-induced fear of nature, related to crime and human danger, has also been shown to deter people from accessing potentially restorative places in nature (Milligan, 2007), despite evidence to suggest that carefully managed vegetation can actually help reduce crime in some places and provide safe outdoor areas for recreational and social activities (Kuo and Sullivan, 2001). Findings from Milligan and Bingley's (2007) study on childhood play and perceptions of woodland areas suggest that factors such as a belief in stranger danger, a strong litigation culture in a western world, and complex safety regulations work to constrain and limit health promoting opportunities in nature, particularly for children. Milligan and Bingley's study indicated that parental anxieties were an important factor influencing their children's perceptions of safe play areas. Parents' own childhood experiences with unstructured play in nature helped to decrease anxieties about woodland areas. For these participants, early childhood experiences in woodland places provided opportunities to develop a sense of self agency, independence, and inner strength.

Further, participants in our study described their favorite places as contexts for learning about and caring for the natural world. As participant data suggested, many people may have an inborn desire to explore, experience, and learn about local geographies, often developed through childhood play in similar

places. However, Sobel (2008) argues that modern culture often draws people away from hand-on experiences in nature when school curricula, for instance, encourages students to memorize facts and animal taxonomies while never setting foot outside to experience and become part of the ecosystems they are studying, and participants' comments in our study support this argument. As many of our participants described and several scholars argue, deficient knowledge of nature can be further complicated by a technological world that often robs people of time outside (Kahn, 1999, Orr, 1992, 2004; Rosak, Gommes, & Kanner, 1995). Hands-on and outdoor experiences are what Fritjof Capra (2004) would describe as the basis of ecological literacy and the intergenerational education we need for sustainable living in modern society. Capra suggests that in creating sustainable societies people need to engage with nature in everyday life to experience and learn about nature in our communities. As many scholars assert, by being in nature, people can come to know their embedded place in the web of life (Capra, 1996, 2004; Orr, 2004; Smith & William, 1999).

Participants in our study, like Sorbel (2008) and Capra (1996, 2004) argue that more local and place-based experiences that immerse people in nearby nature are needed to encourage activities like hiking and gardening that can have a more positive impact on human health but also on the development of pro-environmental behaviour. Sorbel (2008) contends that knowledge and experience in nature, together with a sense of agency, a sense of responsibility, and ability to make change for the greater good, influences whether people recycle or walk instead of drive. It is common knowledge that people do not always respond to or

live in ways that reflect what they know. For instance, many people know that smoking causes cancer, but continue to smoke. Similarly, it makes sense that knowledge about nature and health does not automatically translate into pro-environmental behavior. If local conditions make it too difficult to experience nature, to get to a green space or if a local system for composting is lacking, people are unlikely to promote their own or ecosystem health in these ways, regardless of their ecological sensibilities.

Participant data from our study coincides with a surge in research on health and place in recent years (e.g., Collins et al. 2009; Crooks & Andrews 2009) that corroborates the notion that local contexts can restrain or privilege our behaviors. If citizens have access to walking trails nearby, they may be more likely to use them for recreational exercise, and if connected to other places, more apt to use them for active transportation over driving. By being in and caring for nature, people may also develop ecological sensibilities about nature (Rodmad, 1983; Brown & Bell, 2007), and then be more apt to commit to pro-environmental behaviors such as reducing consumption, recycling, and decreasing carbon emissions (Hartig et al., 2001; Carrus et al., 2008). These sensibilities and behaviours reflect a broad notion of ecological sustainability that McMichael (2006) describes as "not just about maintaining the flows from the natural world that sustain the economic engine nor maintaining iconic species and iconic ecosystems. It is about maintaining the complex systems that support health and life" (p. 579-580).

The study findings also suggest that improving access to nearby restorative outdoor places should be explored as a long term and sustainable strategy for promoting both human and environmental health. In Canada and many other developed countries, programs and policies in public health tend to focus on individual level health education and lifestyle behaviors and less on the living and working conditions that shape these behaviours, including social and economic factors that can limit access to resources for health (Alvaro, et al., 2010, Lyons & Langille, 2000). Some argue that sweeping changes in government policy around minimum wage and social assistance are needed in Canada to ensure all people have access to the resources needed for healthy living (Alvaro et al., 2010). At the same time, policy-makers cannot be assigned all of the blame for the decisions to-date around the allocation and distribution of resources or the focus on individual behavior change. As participants in our study suggested, appropriate evidence-informed decision-making tools and processes for sound socio-ecological policy have not always been available to policy-makers, who share with other citizens the same culture that some of our participants critiqued as too narrowly focused on economic and technological progress.

In our study, participants' indicated that barriers to change in practice and policy included lack of public and stakeholder awareness of public health concerns and limited evidence that decisions and initiatives in diverse sectors could impact human health. Similarly, Clark et al.'s (2010) study garnered stakeholder perspectives on walk-able neighborhoods through interviews with employees in municipal and provincial governments, city councilors, and others

from private sectors to determine the factors that influenced decisions to design neighborhoods that enabled physical activity and food security. Also aligned with our findings, Clark et al. identified social norms as possible barriers to decision-making for health that included working in silos and lack of collaboration with other sectors.

In contrast, community and school vegetable garden initiatives may exemplify the norms and inter-sectoral processes needed to create accessible resources for children, families, and community members. As described by several participants in our study as well as by Teig (2009) and Glover (2004), community gardens are places that can enable social connectivity, physical activity, and access to nutritious foods and that can bring people together to actively grow, harvest, and at times, even cook and eat healthy nutrient-rich food. The sustenance of community gardens tends to be a process that relies on citizen engagement in ways that can be inclusive, independent of income, education, or culture, and transcend societal divides in many ways. As illustrated in Glover's (2004) work, however, exclusion and differential access can still happen in the development of community gardens when certain groups of people are left out of this process.

Ideally, community and school edible gardens are created and sustained by students, teachers, and other diverse community members in partnership with people from other sectors such as public health, nutrition, culinary schools, local businesses, non-profit organizations like Slow Food and others, depending on the unique needs and resources within each community. Securing knowledge, skills,

resources, and infrastructure for community gardens is often a shared process. Advocacy groups, formal and informal working groups, media campaigns, marketing tools, community-based research, and community forums can all be used in developing and garnering support for such initiatives.

On a more broad policy level, it is arguable that our findings support the need to question what forms of governance effectively enhance the coordinated promotion of human and environmental health. In the view of The Institute on Governance, a Canadian non-profit think tank that examines examples of governance in diverse contexts in its mission to "improve governance for public benefit both in Canada, and abroad", good governance is a democratic process "whereby power is exercised, decisions are made, citizens or stakeholders are given voice, and account is rendered on important issues" (Edgar et al., 2006, p. 2). They further argue that good governance is "about effective ways of continuously engaging various sectors of society" (Edgar et al., 2006, p.4). The European Union's 'Health in all Policies' is a related initiative (2006) to integrate perspectives of health into decision-making processes across sectors beyond, but including, the health sector (Stahl et al., 2006). These efforts attempt to address the broad interconnected social, cultural, economic, and political influences on health that are critical to sustainable health outcomes (PHAC, 2007). However, our study findings also suggest that these efforts may possibly be enhanced by attending to the reciprocity between the health of people and their shared natural ecosystems. It is arguable that to protect and promote the long term health of people and the planet, policies and processes across sectors need to become more

accountable to this reciprocity. For this to occur, however, processes for inter-sectoral governance of human and ecosystem health need to be realized through on-going research, practice, and policy. Table 6.6, which provides a matrix of proposed inter-sectoral governance processes and recommendations for research, practice, and policy that are rooted in the study findings and related literature and offer some ideas for future directions in this area. These processes and recommendations focus on strategies to actively engage civil society within and across diverse sectors and levels of government to participate in evidence-informed decision-making that accounts for long-term human and ecosystem health. The matrix also accounts for possible knowledge translation pathways through research, practice, and policy.

Table 6.6
Recommendations for Research, Practice and Policy

Processes for inter-sectoral governance	**Research**	**Practice**	**Policy**
Collaboration among sectors	Building knowledge in ways that unite people from diverse sectors, government, and civil society	Developing roles and responsibilities to merge silos and partner with advocacy groups	Intersectoral decision-making tools –health (human and ecosystem) in all policies
Commitment to human and ecosystem health	Conducting intervention research, testing initiatives at the individual, organizational, community, and policy levels.	Creating local community conditions and opportunities that enable access to restorative places	Using research and indicators for human and ecosystem health rooted in the voices of citizens and reflective of local contexts.

Citizen engagement	Engaging in community-based research with citizens, examining their experiences in local contexts.	Involving citizens in identifying needs, and participating in interventions for change.	Using research and citizen perspectives to identify needs, opportunities, and ways forward in policy development

The notion of inter-sectoral governance is not new. In a conference report on inter-sectoral action for health, the World Health Organization (1997a) advocated for a renewed system of governance that encourages partnerships across sectors for opportunities in health. What is new is the argument for nature-based health promotion; and the proposed need for individuals and collectives to continue to examine norms in practice and policy and contribute to the creation of community-based access to nearby and accessible restorative places.

6.16 Conclusion

This paper reported on study findings rooted in the voices of an aggregate group of community citizens. Citizen narratives were connected to the perspectives of practitioners, decision-makers, and members of community advocacy groups to examine the multi-level barriers and facilitators of engaging with nature in the promotion of health. The study findings illuminated how people engaged with nature in their daily lives as a resource for health and provided critical insights into possibilities for nature-based health promotion within the community. As one participant proposed:

> You know…it's been a bit of a frustration all around because everybody has a piece for the puzzle but nobody was uniting to put those pieces together and it's really, really exciting to make those first steps (Phase 2, Focus Group 1)

Our study findings provided insight into the role of nature as an everyday resource for health in a rural community in Atlantic Canada where access to nature may be a very feasible yet over-looked resource for health promotion. For instance, a walking path along a river could provide opportunities to walk to school or work while experiencing the restorative qualities of the natural world, a community vegetable garden could enable people of all incomes to secure healthy food, and a transportation infrastructure project could support the creation of a safe biking path along a rural highway.

While the data was weighted toward the benefits of engaging with nature, the literature we have reviewed to discuss our findings also reminds us that places, natural or otherwise, can be health-promoting or hurtful, inclusive or exclusive or any combination thereof (Milligan, 2007) and that these dynamics need to be better understood. The findings therefore leave us with many remaining questions that set the groundwork for future research. For instance, what are the features and characteristics of local areas that predict a sense of well being and belonging for diverse citizens? Which places are more restorative for local citizens and why? What are the fears and risks associated with specific outdoor places in local contexts and why? What are the experiences and perspectives of low income and minority groups? What are the opportunities and possibilities for developing ecological literacy and citizenship in communities, and what health outcomes are associated with such initiatives? What changes to practice and policy norms contribute to human and ecosystem health? How are governance processes best operationalized and managed?

Nature has the potential to be a key resource for health promotion and for upstream initiatives aimed at improving quality of life for people and the planet (Brown & Bell, 2007). Over the last few decades, a new era of public health has contributed to an innovative geography of health that is beginning to account for the broad determinants of healthy living and the place-based influences on health (Health Canada , 2002, Rapheal, 2006). Yet, as Frumkin (2003) and Brown and Bell (2007) suggest, greater attention to our everyday natural places is still needed. Although there are many health benefits to connecting with restorative places in nature (Armstrong, 2000; Glover et al., 2005; Kingley & Townsend, 2006; Teig et al., 2009), there are also risks and fears associated with outdoor areas (Collins & Kearns, 2007; Milligan, 2007), and a better understanding of the opportunities for and barriers to connecting with these potential settings for health promotion can provide critical new directions for public health. Data from this study point to norms in practice and policy that are difficult to change in a world where people are very used to working in silos and tend to rely on problem-based and costly interventions. Yet, our findings suggest possibilities for future research and for inter-sectoral governance processes that may help to change norms, strengthen access to restorative outdoor places, and contribute to healthy communities.

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Chapter Seven: Final Thoughts and New Directions

When one tugs at a single thing in nature, he finds it attached to the rest of the world.

John Muir, Naturalist, Preservationist (1838-1914)

In this final chapter I draw together key points from the dissertation chapters to offer inter-related insights about nature-based health promotion and to identify possibilities for next steps in research, practice, and policy. I begin by depicting key contributions of this study relevant to nursing and other disciplines. I then identify practice and policy opportunities for continued knowledge development and exchange within the local community and suggest possibilities for collaborative research initiatives that attend to the broader multidisciplinary agenda for health.

7.01 Key Study Contributions

An integrated approach to nursing, environmental health, and health promotion, one that recognizes our connections with nature as tied to the health of individuals, families, communities, and ecosystems across the globe, can potentially advance our ability to protect and promote human and ecosystem health in everyday 'ground-breaking' ways. However, the study findings suggest that this may require a shift in how we think about and address health. As Ophuls (1977) seminally pointed out:

> The ecological crisis is in large part a perpetual crisis: Ordinary human beings simply do not see that they are part of a delicate web of life that their own actions are destroying, yet any viable solution will require them to see this. (pp. 222-223)

The conceptual framework for nature-based health promotion described in chapter two (refer to Figure 7.1 below) provided new conceptualizations of health, health promotion, and environmental health that attempt to account for the web of influences and health promoting connections between people and the natural environment (Hansen-Ketchum et al., 2009).

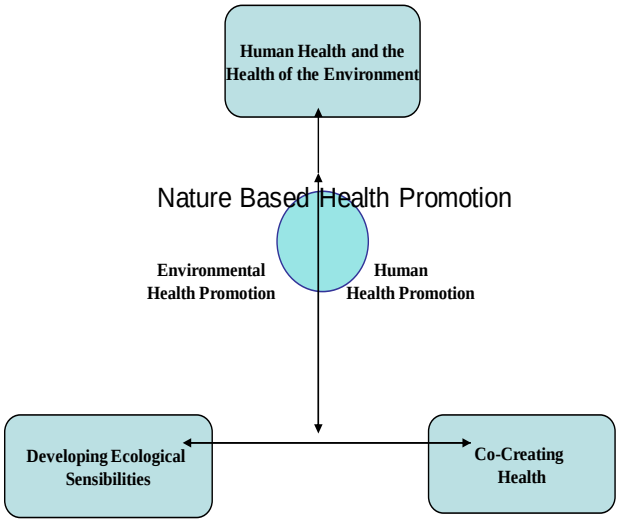

Figure 7.1. Original conceptual framework: Fundamental elements and outcomes of nature-based health promotion

In relation to the dissertation study, the conceptual framework helped to first frame the research problem, questions, and research design and then subsequently added a level of a priori theory to the dialectic during data analysis. The analytic findings of this study provide some validation for these original conceptualizations, but also expand the initial framework by illuminating the

relevance of experiences in nature and potential participatory processes pertinent to nature-based health promotion in the local context. The study findings characterized experiences in nature as sustainable activities and practices that contributed to mental, spiritual, and physical well being, fostered social connectivity, and created opportunities for ecological citizenship. Expanding the original framework, participatory processes of inter-sectoral governance and shifts in practice and policy norms across sectors were identified as potential overarching guideposts in addressing the barriers and facilitators for access to restorative places and experiences (refer to Figure 7.2 below).

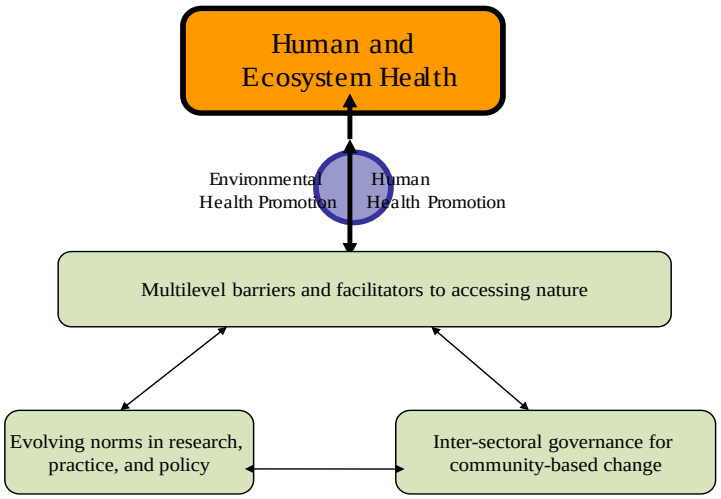

Figure 7.2. The expanding conceptual framework for nature-based health promotion.

The expanding conceptual framework together with the study findings provide a basis from which to enlarge and strengthen notions of nature-based health

promotion through future research, practice and policy work where diverse groups of citizens and sectors are engaged to examine and test specific interventions relevant to local contexts.

It became evident in designing this study that although there is already a scientific body of literature on the health effects of engaging with nature that spans multiple disciplines such as environmental sciences, recreation and leisure, psychology, urban planning, and health geography, there are very few related nursing studies. There remains huge potential for nursing to contribute to health through further research, knowledge development, theory building, and practice in this area. As identified in chapter three, a review of research across disciplines reveals knowledge gaps about citizen, practitioner, and decision-maker perceptions of the barriers and opportunities for connecting with nature in shared contexts, and on interventions in organizational and community contexts including dovetail initiatives with active transportation, and healthy living projects for instance. Further, few studies have acquired narrative accounts of experiences in local contexts or used participatory approaches to engage citizens, practitioners, and decision-makers across sectors to examine nature-based strategies for health promotion. Building on gaps in research across diverse fields, the dissertation study was designed around two primary research questions aimed at generating knowledge about experiences of engaging with nature in the local context alongside practice, and policy directions for designing related community-based health promotion interventions.

The research findings suggested that restorative places can provide conditions for enriching experiences to both promote health and foster ecological citizenship, a concept central to nature-based health promotion described in chapter five. Although the study data were imbalanced toward the benefits of engaging with nature, the literature helped to expand the notion that nature-based places such as walking paths or community vegetable gardens can be health-promoting or pose risks, be inclusive or exclusive. The findings and associated literature pointed to possible participatory forms of research, practice, and policy needed to create contexts that enable better access to restorative outdoor places and opportunities to exercise ecological citizenship. As described in chapter six, data provided beginning insight into needed shifts in practice and policy norms across sectors and possibilities for inter-sectoral governance for human and ecosystem health.

7.02 Reflections on Method: Insights and Limitations

As outlined in chapter five, participatory research methods helped generate findings that illustrated the health promoting value of restorative places to participants, the opportunities and constraints to accessing nature in the community, and the potential implications for future research, practice, and policy. Participatory methods enabled me to answer the dissertation research questions in ways that helped to equalize power between researcher and participant. Participant-led photo narrations and photo elicitation interviews and focus groups provided opportunities to partner with participants in the development of knowledge. The process of bringing participants together to share perspectives

and discuss photographs connected them to each other and to their local and shared natural environments. The resulting findings were rooted in community perspectives and relevant to local citizens, practitioners, and decision-makers.

Using an iterative approach to data analysis that incorporated opportunities for ongoing dialogue with participants helped to produce findings that were tied to varied perspectives and the physical, social, cultural, political and economic context. The findings were rich with contextual insights and participant-driven possibilities for change that less participatory methods may not have captured. As Reason and Bradbury contend about participatory methods, "seeing social change as a research activity forces us to think of community ties and critical awareness as forms of knowledge" (p. 215). Yet, the implications of the findings are constrained by the study limitations. For instance, those who participated in the study, including myself, came with bias toward the value of engaging with nature. From a critical perspective, this bias limited the acquisition of data on the negative aspects of engaging with nature including the risks and fears associated with some places. In this way, data from participants who were not interested in, feared or were unable to engage with nature were not acquired. Further, by selecting parents of young children as an aggregate group of community citizens, other groups of people like adolescents, families without children, and elderly people among others, were excluded from the study. And although the recruitment strategies targeted participants with diverse incomes and levels of education, the resultant sample was a relatively homogenous middle

class group. As such, the relevancy of the findings to people of lower incomes or disadvantaged groups is questionable.

7.03 Future Directions for Research, Practice, and Policy

While future studies will need to build from the limitations discussed, the current findings helped us to better understand possible underlying links and interactions between people's everyday lives, restorative environments, and health promotion and set the groundwork for future research. As such, the findings have left us with many remaining questions. For instance, what are the features and characteristics of local areas that predict a sense of well being and belonging for diverse citizens in the community? What are the perceived indicators of restorative outdoor places for citizens in rural communities across Atlantic Canada? What are the experiences and perspectives of low income and minority groups? Which places are more restorative for local citizens and why? What are the fears and risks associated with specific outdoor places in local contexts and why? If walking trails or other interventions are created will people use these places? Who would be excluded and why? Which interventions are more restorative and ecologically-sound and why?

It is also useful to question: What are the conditions of access to specific restorative places? Could nature be integrated into local indoor working environments and with what outcomes? What are the opportunities and possibilities for developing ecological literacy and citizenship in communities? What health outcomes are associated with such initiatives? Would improved access to restorative outdoor places positively influence active living in

obesogenic environments? How do we best examine norms in various sectors and determine if and how they are responsive to human and ecosystem health? What changes to practice and policy norms contribute to human and ecosystem health? How will we measure these changes? How are governance processes best operationalized and managed?

Table 7.1 provides a concise view of beginning possibilities for inter-sectoral governance processes in research, practice, and policy that may help to find answers to some of these questions in the future. The proposed recommendations stem from the study findings described in chapter six as well as my experiences with and critical interpretations of related research and theoretical literature. These broad strategies reflect a plausible need for active engagement of civil society with diverse sectors and levels of government alongside keen decision-making that accounts for long-term human and ecosystem health.

Table 7.1
Recommendations for Research, Practice and Policy

Processes for inter-sectoral governance	**Research**	**Practice**	**Policy**
Collaboration among sectors	Building knowledge in ways that unite people from diverse sectors, government, and civil society	Developing roles and responsibilities to merge silos and partner with advocacy groups	Intersectoral decision-making tools –health (human and ecosystem) in all policies

Commitment to human and ecosystem health	Conducting intervention research, testing initiatives at the individual, organizational, community, and policy levels.	Creating local community conditions and opportunities that enable access to restorative places	Using research and indicators for human and ecosystem health rooted in the voices of citizens and reflective of local contexts.
Citizen engagement	Engaging in community-based research with citizens, examining their experiences in local contexts.	Involving citizens in identifying needs, and participating in interventions for change.	Using research and citizen perspectives to identify needs, opportunities, and ways forward in policy development

Overall, the five dissertation manuscripts contribute to ongoing theory development for nature-based health promotion through identifying gaps in related research across diverse fields, exploring the merits and limits of a participatory qualitative approach in this field, and generating findings that support ongoing efforts to promote and protect the health of people and the natural world.

7.04 Knowledge Generation and Exchange

In this dissertation study, the iterative, participatory design lent itself to collaborative knowledge generation and exchange in that it enabled parents, practitioners, and decision-makers makers to examine and learn about engaging with nature in the local context and to discuss possibilities for related community-based change in practice and policy. The participatory methods of data collection and analysis involved participants in creating knowledge that was potentially relevant to and usable in their personal and professional lives. Further, participants were encouraged to share feedback on their perceptions of strategies which could sustain ongoing knowledge building and health promotion initiatives

beyond the scope of this study. Table 7.2 below outlines suggestions from participants for continued knowledge generation and exchange within the community. These recommendations demonstrate participants' forward thinking and depict an array of ideas to consider as I continue to collaborate with the community on related interventions.

Table 7.2
Knowledge Generation and Exchange: Participants' Suggestions

Participant Suggestions for Local Knowledge Generation and Exchange
1. Create an inventory of local green space, trails, and restorative places as a baseline informational resource.
2. Create posters and pamphlets that highlight nature-based health promotion by incorporating photographs and details on local restorative places and activities in nature. Make these available on bulletin boards in community places such as convenience stores, health care centres, farmers markets.
3. Facilitate educational in-services on nature-based health promotion for teachers, health care professionals, care givers, local businesses.
4. Continue to strengthen curriculum and programming of day care and schools, encouraging free play in conjunction with experiential learning activities in nature.
5. Incorporate messages about the significance and opportunities for nature-based health promotion into the health content that public health nurses discuss with the public.
6. Collaborate with the Department of Natural Resources to incorporate posters and plaques that describe various species and ecosystems for display within the community so that as people walk by various trees, rivers, geographical formations, they will be able learn about their local environment.
7. Incorporate vegetables and herbs into flower baskets/containers and gardens around town so that they could then be harvested and used by local citizens. These plants could also be labeled and described for informational purposes.
8. Develop on-going partnerships between departments of health, recreation, environmental health, community planning, and transportation (for instance) to ensure health and nature are both considered in transportation infrastructure renewals and other initiatives.

9. Create local contexts that enable access to restorative places and experiential knowledge building. Walking paths, community gardens, and organized events in nearby restorative places are examples.
10. Create on-going partnerships with children and seniors –sharing knowledge and skills such as gardening, harvesting, and preserves.
11. Organize clean up and maintenance crews that involve the youth and inter-generational citizens in taking care of shared outdoor places.
12. Create opportunities for on-going workshops and meetings that unite diverse sectors and citizen groups and foster discussions on nature-based initiatives within the community.
13.Conduct on-going community-based research to collectively identify and work on specific interventions targeting nature-based health promotion for all.

Furthermore, I intend to share the findings with multi-sectoral colleagues and nursing students through informal discussions and workshop presentations and invite their thoughts on the use of the findings in their own lives and practice as well as their ideas for further knowledge exchange and subsequent research. I will also build on the limitations of this research and the questions arising from the findings to develop and implement subsequent studies.

As such, I will continue to use and strengthen a nature-based health promotion lens to inform and contribute to the broader collaborative research agenda for health. For instance, I anticipate becoming involved in collaborative research with citizen groups and colleagues from health, kinesiology, education, earth science, restoration and policy sciences and from sectors such as community health, recreation, community planning, and transportation, on the indicators for restorative environments in local communities and on subsequent interventions that may help create community contexts and programming for equitable, safe,

and ecologically- sound access to natural places. Similarly, I will likely conduct participatory research on the influence of the natural environment on the health of diverse sub-populations such as children, elderly people, lower income groups, and obese youth, among others.

I am also hopeful for future opportunities to collaborate with citizens and colleagues from health, nutrition, earth sciences, biology, education, restorative science and from sectors such as community health, business, recreation, and agriculture, to study and advance food security and work in obesogenic environments. Conducting research that examines the integration of nature-based health promotion into other health promotion and/or ecological initiatives like healthy eating and active living programs, or the creation of community green spaces will be an important piece of my post-doctoral work. I also imagine my involvement in research examining initiatives to 'green' the health sector, particularly acute and long term care organizations, partnering with citizens, colleagues from health, nutrition, earth sciences, department of natural resources, and restorative sciences among others. Involvement in health research and knowledge translation networks will also be vital in the on-going mutual exchange of ideas and directions for local, provincial, national and international research agendas.

Further, I expect to use current and future research to enhance nursing curricula and students' learning experiences by examining current practices and curricular content and exploring possibilities ranging from reshaping paper usage and recycling practices to joining forces with other disciplines like restoration and

earth sciences to create opportunities for students to learn about, create, and connect people to restorative places and experiences within the community. It will also be important to study nurses' engagement with nature and examine strategies for nature-based health promotion in diverse health settings. With a new and expanded view of health that accounts for the conditions and processes that promote health living for people and the planet, nurse are well suited for work in nature-based health promotion. Nurses can help foster a collective accountability to the reciprocity between humans and nature and contribute further to the short and long term health of individuals, families, communities, and shared natural ecosystems.

7.05 Concluding Comments

This dissertation study provided an opportunity to examine local community-based experiences of engaging with nature and provided insight into possibilities for integrating nature into our everyday lives as community citizens and into our work as health practitioners and decision-makers. It also set the stage for building future work in this area. Early post-dissertation initiatives stemming from my study are already underway. For instance, a community partner and I developed an abstract for a paper presentation on *Developing Integrated Community Sustainability Plans* that was accepted by the Alberta Centre for Sustainable Rural Communities (ACSRC), University of Alberta, for an up-coming conference (October, 2010) entitled *Taking the Next Steps: Sustainability Planning, Policy and Participation for Rural Canadian Communities*. Based on invitations from participants in the study, I have also

been participating in community workshops on active transportation and edible garden initiatives within the community. I have also been invited to learn more about and participate in an initiative in the community that is connecting families to restorative places in nature; an initiative motivated, in part, by the study's focus group discussions.

The goal of my post doctoral research program will be to conduct research that aims to better understand and foster the reciprocal relationship between and promotion of human and ecosystem health. I hope that my future research and scholarship will offer an integrative nursing and nature-based health promotion lens that will help inform and strengthen work in health care and in other sectors and disciplines. The dissertation study has created research and practice synergies that are leading me toward new and innovative initiatives at the individual, organizational, community, and policy levels to better understand and help create sustainable conditions that may enable people and nature to thrive. Restoring connections with nature has potential for long term "social and political transformations" (Pretty, 2004, p. 74) which can help promote, protect, and sustain the health of humans and the environment in which they live.

It is common knowledge that the world is currently experiencing environmental crises with the depletion of natural resources, air pollution, water shortages, loss of biological diversity, and toxification of food chains to name a few (Kellert, 1993; Watterson et al., 2005). Kellert would argue that what people do not as readily recognize is that these problems are "symptomatic of a fundamental rupture of human emotional and spiritual relationship with the

natural world" (1993, p.46) and that it is now time to use research to better understand this relationship and create conditions that promote and protect human and ecosystem health. The dissertation findings urge us toward possibilities for repairing this rupture with knowledge of a healthier path for people and nature that is within our grasp.

Figure 7.3. Hansen-Ketchum, personal photograph

The least movement is of importance to all nature.
The entire ocean is affected by a pebble.

Blaise Pascal, Mathematician, Physicist
(1623-1662)

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Appendix A: Phase 1 Poster of Invitation to Parents

Research Project:
Engaging with Nature in the Promotion Health

Do you or would you enjoy engaging with nature to promote your own and your family's health?

Are you a parent of a young child/ children (aged 1-4 years)?

Would you like to participate in a study about engaging with nature in your community?

What does engaging with nature mean?

Engaging with nature means connecting with the outdoor environment (e.g. green spaces, trees, plants, beaches, rivers); a process that some researchers suggest can help improve our sense of well being and quality of life. When we spend time with nature we may also be more likely to care about it and protect it!

If you would like to take part in this research, or want to find out more about the project, please contact Patti Hansen-Ketchum at 902-867-5027 or phketchu@stfx.ca

Appendix B
Examples of Phase 1 Participant Recommendations and Phase 2 Participant 'Fit'

Substantive Examples of Barriers/Facilitators from Phase 1 Data	**Sectors Phase 2 Participants**
1) Awareness: Parents suggested that many people were not aware of the influence of nature on health nor the impact people have on the health of ecosystems. Information on local restorative places was also considered hard to find. Simple suggestions for free play activities in nature were also considered important but often forgotten. Parents suggested that educators, care givers, and public health nurses would be important in sharing this type of information with families and the public.	-Public health (public and community health nurses) -Education (instructors involved in developing curricula and teaching undergraduate education programs) -Day care center (staff and directors of local day care centres) -Community services -Community advocacy groups -*Family resource centre -*Big Brothers, Big Sisters
2) School programming/curricula: Parents suggested that continuing to strengthen programming/curricula in day cares, resource centres, and schools would be helpful in encouraging children and parents to learn about, appreciate and engage with nature in an experiential way.	-Public health -Education -Day care centre -Community services -Community advocacy groups -*Family resource centre -*Big Brothers, Big Sisters
3) Play areas: Barren play areas for children were consider problematic but were seen as opportunities to plant fruit trees and create gardens in playgrounds, around schools, and have the children involved in the projects.	-Community health board -Public health -Education -Community planning -Sustainability committee -Community services -Community advocacy groups

5) Access: Access to free accessible nature-based places like walking/biking trails was considered vital but lacking. More specifically, ecologically sound paths through nature with 3 distinct features were suggested: 1) paths that strategically connect to locations within town; 2) safe, child and stroller friendly, with adequate lighting; 3) patterned with apple trees and berry bushes (for example) to enjoy, forage and use.	-Community health board -Public health -Community planning -Sustainability committee -Dept of recreation -Educators -Day care centres -Community services -Community advocacy groups *Department of transportation
7) Pro-environmental behaviours: Parents suggested that fostering pro-environmental behaviours among all populations groups was vital to keeping local places safe and healthy so that they could be accessed and enjoyed. Encouraging the use of a clothes line, organizing clean-up crews and supporting local produce via the local market were examples.	-Community health board -Public health -Community planning -Sustainability committee -Community advocacy groups

***sector recruited but unable to attend**

Appendix C: Phase 2 Poster of Invitation to Practitioners and Decision-makers

Research Project: Engaging with Nature in the Promotion of Health

What does engaging with nature mean?

Engaging with nature means connecting with the outdoor environment (e.g. green spaces, trees, plants, beaches, rivers); a process that some researchers suggest can help improve our sense of well being and quality of life. When we spend time with nature we may also be more likely to care about it and protect it!

Are you a health practitioner and/or decision-maker who would like to discuss the health benefits of engaging with nature?

Would you like to participate in a study to identify the supports, challenges and opportunities for nature-related community-based interventions?

If you would like to take part in this research, or want to find out more about the project, please contact Patti Hansen-Ketchum at 902-867-5027 or phketchu@stfx.ca

Appendix D
Phase 1 Photography Protocol for Researcher
(Original-implemented as planned)

Research Study: Engaging with Nature: A Participatory Study in the Promotion of Health.

When a participant first contacts me I will re-cap the study and ask if they have any questions or comments. I will then request and arrange an in-person meeting to explain the process of taking photos.

Prior to first in-person meeting with participants:

1) Following this first contact I will note the participant's name and date of first contact (see Chart A below). These charts will be kept in my locked filing cabinet for safe keeping.
2) I will then gather together the following equipment in preparation for the first meeting:
    a. 2 copies of the consent form
    b. 1 copy of the participant photographic protocol
    c. New recyclable camera
    d. Self-reflection photo chart/pen
    e. Digital recorder
    f. Meeting card for participant – to note the 'when/where' of our next meetings
    g. Participant thank-you items (e.g. farmer's market dollars)

Participant name	Assigned #	Date of first contact, agree to meet?	Participant contact number	Date/time/ location of first meeting re. photo protocol?

Chart A: Photo protocol phase 1; first contact with participants and scheduling meetings. (will landscape this for usability).

At the first meeting with each participant:

1) I will explain the study, ask/answer any questions and have the participant sign the consent form once we both feel she/he is informed. A copy of the form will be given to the participant (see Chart B below).
2) I will then discuss the Participant Photographic Protocol and provide the participant with the following equipment:
    a. disposable camera,
    b. photo chart/pen and/or digital recorder.
    c. hard copy of the written protocol
    d. 10 copies of the consent form for any potential photographees (see tracking Chart B below).
3) I will then arrange my planned checking-in phone call for the subsequent week as well as the date/time/location for: a) pick up of the camera/logs and b) our individual interview(see Chart B below).
4) I will write these dates/times/location on a meeting card and leave it with the participant for reference.

Participant #	Date/time/ location of first meeting re. photo protocol?	Consent signed?	Protocol for participants discussed? Copy provided?	10 copies of the consent for potential photographees explained and provided to participants?	Camera provided?	Photo chart/ pen or digital recorder?

Chart B: Photo protocol phase 1; meeting with participants to review protocol and provide equipment

Prior to the individual interview:

1) I will have 2 copies of the photographs printed; one copy will be provided to the participant during the interview, the other I will keep in an envelop with the participant's assigned number on it. I will also put this same number on the back of each photo from that participant.
2) I will scan the photos into a ppt file, labeled using the associated participant #, not name.
3) Analyze the participants' photo logs and photographs
4) I will arrange tentative dates for the focus groups and discuss with the participant during the interview.
5) Gather equipment
    a. A copy of photos for participants
    b. Digital recorder
    c. Note pad/pen
    d. Chart C (below) for tracking
    e. Interview guidelines
    f. Thank you card and farmer's market dollars
    g. Focus group meeting card reminder

At the time of individual interview:

1) I will obtain verbal informed consent by reviewing the next steps in the study and determining if the participant agrees to continue.
2) I will use Chart C (below) as a tracking mechanism.
3) I will digitally record the interview, with participant's prior consent.
4) I will use the interview guidelines to facilitate the interview and in the process will ask the participant to select 2 photographs for use in the subsequent focus groups with parents and possibly practitioners and policy makers. The photographs selected should reflect two of the following elements:
    a. the barriers to engagement with nature in their community;
    b. the opportunities they see for engagement with nature.

#	On-going informed consent obtained?	Digitally recorded?	Copy of the photographs provided to participants?	Pictures selected for focus groups in phase 1 & 2	Thank you card with copy of pictures and farmers market dollars provided?	Date/time/location of focus group with parents _____. Does this work?

Chart C: Photo protocol phase 1; interview, planning for focus group

<u>Prior to focus group with parents</u>:

1) Analyze participants' interview data prior to focus group, linking photos to emergent themes.
2) Create ppt with pictures selected by participants for the focus group and outline broad themes.
3) Arrange meeting room (e.g Health Connections community centre, on-campus, or NCC)
4) Call each participant 2 days prior, as a reminder.
5) Arrange healthy snacks, coffee, tea, plants and white board for the room.
6) Bring the following:
    a. Digital recorder and extra batteries
    b. Paper/pen
    c. Chart D below
    d. ppt presentation
    e. Thank you cards and farmer's market dollars

<u>At the time of the focus group with parents</u>:

1) Obtain on-going verbal informed consent from participants at the start of the focus group.
2) Obtain consent for digitally recording the interview and then record.
3) Present pictures and themes for discussion
4) Discuss participants' recommendations for practitioners and decision-makers who, based on the data, should be included in Phase 2
5) Make arrangements with participants to receive a follow-up summary of the study and request their final feedback and recommendations.

#	Reminder call (2 days prior to the focus group). Confirmed?	On-going informed consent obtained at the beginning of the focus group session? Digitally recorded?	Pictures selected by participants for <u>Phase 2</u> focus groups.	Thank you card with copy of pictures and farmers market dollars provided?

Chart D: Photo protocol phase 1; focus group

After the focus group:

1) Analyze the transcript data, linking photos to emergent themes.
2) Create ppt with pictures selected by participants for use in Phase 2. Outline themes
3) See Phase 2 focus group guidelines.

Appendix E
Phase 1 Photographic Protocol for Parents Collecting Visual and Narrative Data (ORIGINAL WITH REVISIONS NOTED)

Research Study: Engaging with Nature: A Participatory Study in the Promotion of Health.

During the next two weeks you will take pictures of how you engage with nature and the barriers and facilitators to connecting with nature within your community.

What does engaging with nature mean?
Engaging with nature means connecting with your outdoor environment (e.g. green spaces, trees, plants, beaches, rivers); a process that some researchers suggest can help improve our sense of well being and quality of life. When we spend time with nature we may also be more likely to care about it and protect it!

What kinds of photographs do I take?
The pictures should be about your experiences of engaging with nature in your community and/or the barriers and opportunities you see there. Your community in this case is where you spend time outdoors– it can be the outdoor places you might go to (or through) during your lunchtime if you are working and out for a walk. It is where your family may like to have picnics or where you take your dog for a walk. It may be where you go for peace of mind or recreation. It may also be where you might like to do these things but are unable. For example it might be an area, like a riverside or beach, that is currently full of garbage or a walking trail that is just too hard to get to. These same areas might also be places for us to clean up and restore.

To get you thinking about what pictures to take I suggest that there are three general ways to engage with nature:
1) viewing nature (e.g. looking at the ocean in the distance);
2) being in nature while biking or taking a walk (e.g. walking along the beach or wooded path);
3) caring for nature (e. g. growing a garden, cleaning up a beach).

Remember though, these are only suggestions, you may want to take pictures of other ways that do not fit with these three levels, and that is fine!

What pictures should I not take?

If you take pictures of people, please make sure 1) they are not identifiable in the picture (e.g. at a distance, not facing the camera) OR 2) you ask their permission to be photographed. If they agree after reading information about the research, they need to read and sign a consent form indicating that they agree to have their picture taken for purposes of this research. If a child is in the picture, their parent must sign the consent form.

Please focus your pictures on the outdoors and avoid taking pictures of interior public places (e.g. in your workplace, restaurant or other such commercial or institutional buildings).

What will I need?

- Recyclable camera (provided by the researcher) OR if you perfer, you can use your own digital camera. If you choose to use your own, you will need to provide the researcher with no more than 20 pictures through email or on a disc. *Whether using the recylable or digital camera, you decide how many pictures (20 or less) are needed. For instance, you may find that 10-12 pictures are all you need. * I ADDED THIS SENTENCE BECAUSE PARTICIPANT FEEDBACK INDICATED THAT THERE WAS SOME ANXIETY OVER THE NUMBER OF PICTURES REQUIRED PLUS I DID NOT WANT TO GET BURDENED BY UNNECESSARY PICTURES IN THE ANALYSIS.}
- Photo chart for tracking and labelling photos and reflections (attached) and/or digital recorder.
- Pen

How do I take the pictures?

1) As you go about your daily life over the next two weeks, carry the camera, pen/photo chart (and/or digital camera) in the case provided and take photos throughout the day, evening, week, weekend.
2) To take the photograph, make sure you look through the camera's view-finder (window) at what you want to photograph and click the button at the top of the camera. If is dark outside, switch the flash button on (at the front of the camera) before taking the picture.
3) After taking each picture, wind the film to the next number. * You have 24 pictures to take. *REMOVED THIS SENTENCE BECAUSE FEEDBACK FROM PARTICIPANTS INDICATED THAT THIS LARGE NUMBER WAS DAUNTING.
4) Immediately after you take each picture, record the number of your picture (see number at the top of your camera) on your photo log chart or turn on the digital recorder and briefly describe the picture. In your photo chart or by using your digital recorder, write or talk about what the photo means to you and how it represents or influences your engagement with nature.

When do we meet again?

I will pick up the camera or disc and log on (date/time) _____ at _____ (location). I will then get the pictures developed and meet with you on (date/time) _____at _____ (location) to further discuss the photos and your experiences.

I will call you after the first week to see how things are going. If you have any questions or comments while you take photographs over the next two weeks, please call me at (902) 867-5027 or 867-1115.

Thank you. Enjoy taking pictures!

Patti Hansen-Ketchum

Appendix F: Data Collection Phase 1
Semi-structured Interview Questions
(ORIGINAL WITH REVISIONS NOTED)

Research Study: Engaging with Nature: A Participatory Study in the Promotion of Health.

Thank you for taking photographs of how you engage with nature and the barriers and facilitators to connecting with nature within your community. I have reviewed your photographs and your logs and am looking forward to hearing more about them. You signed the consent form when we first met. Are you still willing to continue in the study and participate in this interview? Do you agree to have our voices tape recorded?

First, let's spread out the photographs on the table and have a look at them. I will give you a minute to look them over.

Having looked at all of the photographs, is there anything you would like to tell me more about?

*Are there other pictures that you would like to share and talk about – e.g. pictures from the past or pictures that you would have liked to use for the study but were unable to take for some reason? * I ADDED THIS QUESTION BECAUSE OF PARTICIPANT FEEDBACK ON PICTURES THAT THEY WISHED THEY COULD HAVE TAKEN BUT WERE UNABLE TO DURING THE 2 WEEKS (BECAUSE OF WORKING, SEASONAL EXPERIENCES, ETC)

Based on my preliminary analysis of your photographs and logs, I have a few additional questions (see examples below)

1) In what ways does nature, the outdoor environment, influence your health. Tell me how it influences your family's health
2) What do you see as the relationship between nature and a) your own and b) your family's health?
3) Do you feel you have enough opportunity to engage with nature?
4) What prevents you from engaging with nature?
5) What enables you to engage with nature?
6) Who do you engage in nature with?
7) How do you influence your children, your family's, your friends' engagement with nature?
8) How do they influence yours?
9) How does your engagement with nature influence your children's and your family's health?
10) *Does your engagement with nature influence how you feel about the outdoors? If yes, how so.
    - Does it influence how you protect and care for the environment? If yes, how so.

- In what ways, if any, do you and your family protect the environment?
- Describe your lifestyle or behavior choices, if any, that may help or hinder the health of the environment? ADDED QUESTION #10 BECAUSE THE LOGS WERE NOT ALL CAPTURING THE RECIPRIOTY AND I WANTED TO EXPLORE THIS FURTHER.

At the conclusion of the interview, the participant should choose two photographs for use in the focus group. I will then ask the participant to:

1) describe select photo #1 and explain why he/she has chosen this photograph.
2) describe select photo #2 and explain why he/she has chosen this photograph.

Final questions related to methods and quality improvement:

1) Are there any questions that you feel I missed and would still like to answer/talk about?
2) Is there anything I could do differently to improve the interview for the next participant?
3) What are your thoughts and recommendations on the process of taking pictures, using the camera, and creating the photo log?

Appendix G: Phase 1 Focus Group Guidelines (Parents) (ORIGNAL VERSION WITH REVISIONS NOTED)

Research Study: Engaging with Nature: A Participatory Study in the Promotion of Health.

1. Introduce myself and welcome parents to the group discussion.

2. *Provide a brief description of the study. * I DELETED THIS BECAUSE I HAD ALREADY GONE OVER THIS WITH EACH PARTICIAPNT AT LEAST 2 OR MORE TIMES.

3. Remind them that the discussion will last approximately 60-90 minutes.

4. Discuss that the session is being audio-taped for analysis purposes. Remind participants that will not be putting names on any comments.

5. Discuss positive group dynamics:
    a. honesty and openness
    b. respect for others' comments
    c. equal participation
    d. keeping on topic

6. Explain that complete confidentiality is not always possible in group discussions but that comments made by participants should not be discussed outside of group.

7. Answer any questions and obtain verbal on-going informed consent.

Discussion :

8. Use ppt to provide an overview of the interview themes and select photographs. With each picture (e.g. 8-10 pics in total) ask the photographer to explain the meaning and history behind it and then help the group examine the picture by asking the following questions:

    i. How does this picture represent engagement with nature in your community?

    ii. What are the barriers to engaging with nature associated with this picture?

    iii. What needs to be done to remove the barriers?

    iv. What are the opportunities the picture presents?

    v. How else could we interpret this picture or what else can we learn from it?

    vi. How is it different from the others?

    vii. How is it similar?

9. *Have participants discuss which 4 photographs should be used in the Phase 2 focus group. Indicate that the photographs should reflect the following elements: a) the barriers they see for their engagement with nature in their community, and b) the opportunities they see for engagement with nature in their community.

After the group discussion, give each member a piece of note paper to write down their 4 personal choices. The responses will be collated following the focus group and used to decide which photos will be needed for Phase 2.
*IT SOON MADE SENSE THAT TO USE THE SAME PICTURES FOR THE PHASE 2 FOCUS GROUPS AS I DID FOR PHASE1. INSTEAD OF TAKING TIME TO ASK FOR THEIR THOUGHTS AGAIN ON WHICH PICTURES TO USE (I HAD ALSO ASKED THEM THIS DURING THE INTERVIEWS) I REQUESTED THEIR FEEDBACK ON MY CHOICE OF PICTURES IN THE CURRENT PRESENTATION.

*WE ALSO ADDED TRIAL BALLOONS TO EXTEND AND PROBE FOR RECMMENDATIONS TO ADDRESS BARRIERS AND FACILITATORS. REFER TO REVISED VERSION TO FOLLOW

Conclusion

10. Summarize the discussion.

11. *Ask what was learned as a result of the group's discussion. * I DID NOT FIND THIS QUESTION A GOOD USE OF TIME - MUCH WAS DISCUSSED ABOVE IN RELATION TO THIS.

12. Ask questions related to quality improvement of methods:
    i. What did you think of the focus group?
    ii. Is there anything I could do differently to improve it for Phase 2 of the research project?
    iii. Are there any questions that you feel I missed and would still like to answer? If so, tell me what they are and we will talk about them.

13. Ask participants who the findings may be most relevant to in terms of creating opportunities to engage with nature in their community.

14. *Invite discussion on how the participants themselves do or do not see the knowledge they have helped to generate as useful. Ask for their suggestions for dissemination strategies and for their ideas about potential future use of the findings in practice and policy. *REWORDED THIS TO MAKE IT MORE CLEAR-SEE REVISED VERSION.

15. Ask and record if they would like to receive and give feedback on a summary of the study.

16. Thank participants for volunteering their time and sharing their thoughts

Appendix H: Phase 1 Focus Group Guidelines (Parents) (FINAL REVISED VERSION)

Research Study: Engaging with Nature: A Participatory Study in the Promotion of Health.

Introduction:

1. Introduce myself and welcome parents to the group discussion. Have participants introduce themselves as well.
2. Explain the purpose of the focus group, which is to: 1) share and discuss emergent themes; 2) discuss the barriers and contributors to engaging with nature in the community; 3) discuss possibilities for community-based strategies for engagement with nature to promote health; and 4) discuss the selection of practitioners and policy-makers for the next phase of the research.

5 mins

3. Remind them that the discussion will last approximately 90 minutes.
4. Discuss that the session is being audio-taped for analysis purposes. Remind participants that I will not be putting names on any comments.
5. Discuss positive group dynamics:
   a. honesty and openness
   b. respect for others' comments
   c. equal participation
   d. keeping on topic
6. Explain that complete confidentiality is not always possible in group discussions but that comments made by participants should not be discussed outside of group.
7. Answer any questions and obtain verbal on-going informed consent.

Discussion:

8. Use ppt and handout to provide an overview of the interview themes and select photographs (e.g. 8-10 pics in total) and ask participants the following questions:
   i. Do these themes speak to your experiences?
   ii. Tell me your thoughts on these themes. Is there anything that I am missing or that I should add, change, elaborate on?

15 mins

Then ask these additional probing questions to expand the data and prepare for Phase 2:

9. Accessibility to natural places was a theme in the interviews. Are natural outdoor places accessible enough in the (town/county)? What are the barriers and facilitators of engaging with nature in (town/county)*? (allow participants time to answer and then probe, as needed, with the following types of questions)*

10 mins- may overlap with the time below)

e. It was suggested by one of you that families in [the area] would benefit from more 'free' accessible nature-based activities; available any time, and that do not encourage large numbers of people at one time (– e.g. paths with apple trees and berry bushes for families to forage, a field prepared for frisbee golf). What are your thoughts on this? Are these types of resources feasible?

5 mins

f. Tell me more about organized nature-based programs for children and families in the area. What are your thoughts on nature-based health promotion programming at your day cares for instance? What are your ideas?

10 mins

g. Our community health board has a 2008-2011 objective "to continue to promote and advocate for active living strategies in the community such as walking trails" – led by the Department of Recreation. If accessible environmentally sustainable nature-based trails (with little impact on the environment) were created, where could they be located? What might they look like?

5 mins

h. Can we ensure that it is not just people who have money who are able to get to parks and healthy natural places?

i. Suppose a car share program is developed in [the area]. Do you think this would help people get to some of these restorative places to enrich their health, learn about and understand nature, or not? (If yes) Would this be sustainable approach? What could a car share program look like here?

5 mins

ii. Suppose a time-bank program (time dollars are used and accumulated by time spent helping each other) is developed in the area. Do you think a program like this would help people of all incomes access the human resources needed to get to an organic garden to pick produce for a reduced cost, to receive an hour of childcare to go for a walk to the Landing or to a learning circle, etc)? (If yes) and/or (If no) Please tell me more…..

5 mins

10. Does your engagement with nature motivate you to protect the environment?

i. Take the woods paths in your backyard that you describe, or the beach areas you like to go to, what keeps these places healthy and accessible? What should we do individually and collectively to ensure these places stay healthy?

5 mins

j. Can we help protect natural places locally and globally in individual and affordable ways? (e.g. some of you described buying local produce, shutting off lights, using water conservatively). If so, explain. Do you think these actions are making a difference – for the environment?...for people's health?

10 mins

Conclusion: Summarize the discussion.

11. Ask participants who the findings may be most relevant to in terms of creating opportunities to engage with nature in their community (e.g. sectors, practitioners, policy makers, etc).

10 mins

12. Ask participants if the same photographs (used in this parent focus group ppt) should be used in the Phase 2 focus group. Indicate that the photographs should reflect the following elements: a) the barriers they see for engagement with nature in their community, and b) the opportunities they see for engagement with nature in their community. Ask for their recommendations

5 mins

on any other pictures (e.g. from their photo narration) that should be used in Phase 2 and their rationale.

13. Request feedback on how I/they can exchange knowledge with others – to disseminate this knowledge with other families, etc. How can we best share with others how our natural places enrich our family's health as well as the importance of taking care of these places?

5 mins

k. For instance, several parents suggested that families (and even teachers) would benefit from information on a) nature-based places to go to, community gardens, etc., and b) simple suggestions for free play activities in nature (e.g. art with rocks, whistling with grass, searching for tadpoles). What would these information resources look like? (e.g. knowledge sharing circles, information sessions, websites, pamphlets).

14. Ask questions related to quality improvement of methods (and have them write it down):

10 mins

iv. What did you think of the focus group?

v. Is there anything I could do differently to improve it for Phase 2 of the research project?

2 mins

vi. Are there any questions that you feel I missed and would still like to answer? If so, tell me what they are and we will talk about them.

15. Ask and record if they would like to receive and give feedback on a summary of the study.

16. Thank participants for volunteering their time and sharing their thoughts.

Total:9
7 mins

Appendix I: Phase 2 Photographic Protocol and Focus Group Guidelines (ORIGINAL WITH REVISIONS NOTED)

Research Study: Engaging with Nature: A Participatory Study in the Promotion of Health.

Prior to focus group with health practitioners and policy-makers:

1) Create ppt with pictures selected by parent participants and outline broad themes.
2) Arrange meeting room (e.g Health Connections community centre, on-campus, or NCC)
3) Call each participant 2 days prior, as a reminder.
4) Arrange healthy snacks, coffee, tea, plants and white board/flip board for the room.
5) Bring the following:
    a. Digital recorder and extra batteries
    b. Paper/pen
    c. Chart A below
    d. ppt presentation
    e. Thank you cards and farmer's market dollars

Participant name	Reminder call (2 days prior to the focus group). Confirmed?	On-going informed consent obtained at the beginning of the focus group session? Digitally recorded?	Pictures selected by participants for Phase 2 focus groups.	Email/contact info for follow up feedback from participants	Thank you card farmers market dollars provided?

Chart A: Photo protocol phase 2; focus group

During the focus group:

1. *Introduce myself and welcome participants to the group discussion. *HAD PARTICIPANTS INTRODUCE THEMSELVES BRIEFLY AS WELL.
2. Provide a brief description of the study.
3. *Remind them that the discussion will last approximately 60-90 minutes. *INCREASED TO 90-120 MINUTES
4. *Explain the purpose of this focus group, which is to examine: 1) engagement with nature in the promotion of health; 2) current and potential use of evidence on the health benefits (for people and the environment) of engaging with nature to inform their work; 3) the barriers and contributors to designing and implementing health promotion interventions that enable ecologically sound sustainable ways of engaging with nature *ADDED TO DIRECT DISCUSSION

5. Discuss that the session is being audio-taped. Remind participants that I will not be putting names on any comments.
6. Discuss positive group dynamics:
   l. honesty and openness
   m. respect for others' comments
   n. equal participation
   o. keeping on topic
7. Explain that complete confidentiality is not always possible in group discussions but that comments made by participants should not be discussed outside of group
8. Answer any questions and obtain informed consent, including permission to record the discussion.

Discussion :

9. *Use ppt to provide an overview of the Phase 1 themes and select photographs (e.g. 8-10 photos) Following this overview ask the following questions: *REWORDED MANY OF THE QUESTIONS BELOW AND FOCUSED ON FEWER PICTURES AND MORE POINTED QUESTIONS FOR CLARITY –SEE REVISED VERSION BELOW.

    i. What do you see as the relationship between nature and the promotion of health?

    ii. How do you use evidence on the health benefits of engaging with nature in your work?

    ii. What are the opportunities the pictures presents?

    iii. Could this community make it easier to engage with nature? How so?

    iv. What are the barriers to engaging with nature associated with these pictures?

    v. What needs to be done to remove the barriers?

    vi. What are the challenges in designing and implementing health promotion interventions that enable engagement with nature in the community?

    vii. What are the supports, resources and opportunities for designing and implementing health promotion interventions that enable engagement with nature in the community?

ALSO ADDED NEW QUESTIONS HERE, BASED ON QUESTIONS ASKED DURING THE PHASE 1 FOCUS GROUP AND THE DATA GENERATED.

Conclusion

10. Summarize the discussion and ask for any further recommendations on ways to design and implement nature-based opportunities for engagement with nature in the community.

11. Ask what was learned as a result of the group's discussion.

12. Ask for suggestions on strategies and opportunities for knowledge exchange. Invite discussion on how the participants might or might not use the knowledge generated (and why or why not). Ask how this knowledge might be effectively shared with and used by others.

13. *Ask questions related to quality improvement of methods: *REWORDED SOME OF THESE QUESTIONS FOR CLARITY AND PROVIDED HANDOUT FOR WRITTEN FEEDBACK IN THE INTEREST OF TIME
    i. Are there any questions that you feel I missed and would still like to answer? If so, tell me what they are and we will talk about them.
    ii. What did you think of the focus group?
    iii. What are your comments on the use of photographs to help examine the issues?
    iv. Is there anything I could do differently to improve it for the next time?

14. Ask and record if they would be willing to a) receive a summary of the study and b) offer further written feedback and recommendations on the summary via email or secure website. Ask for their contact information.

15. Thank participants for volunteering their time and sharing their thoughts

After the focus group:

1) Analyze the transcript data, linking photos to emergent themes.
2) Summarize and outline themes and any outstanding questions for dissemination back to Phase 1 & 2 participants.

Appendix J: Phase 2 Focus Group Guidelines (FINAL REVISED VERSION)

Data Collection Phase 2 Focus Group Guidelines (Practitioners and policy makers)
Research Study: Engaging with Nature: A Participatory Study in the Promotion of Health.

Introduction

1. Introduce myself and welcome participants to the group discussion. Have participants introduce themselves briefly as well.
2. Remind them that the discussion will last approximately 90 minutes.
3. Provide a brief description of the study.
4. Explain the purpose of this focus group, which is to examine: 1) engagement with nature in the promotion of health; 2) current and potential use of evidence on the health benefits (for people and the environment) of engaging with nature to inform their work; 3) the barriers and contributors to designing and implementing health promotion interventions that enable ecologically sound sustainable ways of engaging with nature

5 mins

5. Remind them that the discussion will last approximately 90
6. Discuss that the session is being audio-taped. Remind participants that I will not be putting names on any comments.
7. Discuss positive group dynamics:
   p. honesty and openness
   q. respect for others' comments
   r. equal participation
   s. keeping on topic
8. Explain that complete confidentiality is not always possible in group discussions but that comments made by participants should not be discussed outside of group
9. Answer any questions and obtain informed consent, including permission to record the discussion.

Discussion :

10. Use ppt (with select participant photographs) to provide an overview of the Phase 1 themes. Subsequent to this overview ask the following questions:

Photo elicitation (PE) Question 10: see Slide 2

i. What are your thoughts on the relationship between nature and the promotion of health?

viii. Are we doing enough to enable people to engage with nature in (town/county)? How so?

15 mins- may overlap with the questions below

i. Do you think there are ways you can enable engagement with nature through your work with individuals, families and/or community?

ix. What are the supports and resources for designing and implementing health promotion interventions that enable engagement with nature in [the area]?

x. What are the challenges and barriers in designing and implementing health promotion interventions that enable engagement with nature in the community?

Then ask these additional probing vignette questions – use ppt to guide the discussion:

11. Findings from Phase 1 may be helpful in understanding ecologically sound ways to best meet our community health board's 2008-2011 objective "to continue to promote and advocate for active living strategies in the community such as walking trails". The findings suggest that families in (town/county) may benefit from more free accessible nature-based options like walking/biking trails; more specifically, ecologically sound paths through nature with 3 distinct features for families: 1) paths that strategically connect to locations within town (e.g. to and from schools, along the river through town) enabling families to safely enjoy nature, get exercise, and reduce vehicular driving at the same time; 2) safe, child and stroller friendly, with adequate lighting; 3) possibly apple trees and berry bushes (for example) for families to enjoy, forage and use. What do you think? Is something like this feasible? What would your involvement look like? How could community involvement be fostered? Would this also complement and/or encourage walk-to-school programs?

(PE) Q 11: see Slide 3

10 mins

12. Walking, biking, pushing strollers along rural roads and highways in the County is a safety concern for some. The shoulders of the roads are often rough, narrow, unsafe. How can we address this barrier for rural residents? Some suggestions include providing reflective vests and using extra fill accumulated from other construction projects for building walking and biking paths along rural roads. What are your ideas? Is this feasible and applicable to your work?

(PE) Q 12: see Slide 4

10 mins

13. Fostering stronger partnerships between the young and the old can be an important piece of developing ecological sensibilities and promoting health – engaging with and learning about each other, nature, and sharing knowledge and skills. An example might be bringing children together with older residents to learn about and engage in gardening, harvesting, preserving, etc. What do you think? What are your ideas? Are these types of activities feasible? Applicable to your work? How so?

(PE) Q 13: see Slide 5

10 mins

14. Parents describe the need to increase awareness among families, caregivers, educators, and practitioners about the influence of nature on health and well being as well as the impact people have on the health of ecosystems in which we live. What do you think? What are your ideas? How is this relevant to your work? e.g – (*may use some of the following probes)*

(PE) Q 14: see Slide 6

15 mins

i. Parents suggest that people (e.g. families, caregivers, teachers, nurses, etc) may benefit from information on: a) nature-based places to go to, community gardens, etc., and b) simple suggestions/reminders for free play activities in nature (e.g. art with rocks, whistling with grass, searching for tadpoles). Information needs to get into the hands of parents through other means as well– e.g. the library bulletin board, pamphlets, etc.; to help parents re-think the notion of nature as resource for health, consider options for engaging children in free play outdoors in their own backyards as well as to provide information on the

options in the town and county (e.g. play areas, parks, etc).What would these information resources look like? (e.g. knowledge sharing circles, information sessions, websites, pamphlets).

ii. Parents suggest that this could be a message public health nurses may want to discuss in their interactions with parents and children. What do you think?

iii. Parents suggest that programming in day care and schools would be helpful in encouraging children and parents to learn about, appreciate and engage with nature in an experiential way - encouraging free play in conjunction with hands-on learning activities in nature. What do you think? What is already being done? What could be done?

iv. Some even suggest that playgrounds should have more trees– children could be involved in planting and watching them grow, picking apples from apple trees, and even benefiting from the shade on sunny days. School vegetable and flower gardens may also be other options. What do you think? What is already being done? What could be done?

15. Can we ensure that it is not just people who have money who are able to get to parks and healthy natural places? Possible probes…

(PE) Q 15: see Slide 7

i. Suppose a car share program is developed in [the area]. Do you think this would help people get to some of the restorative places outside of town (e.g. Provincial park) to enrich their health, learn about and understand nature, or not? (If yes) Would this be sustainable approach? What could a car share program look like here?

ii. Suppose a time-bank program (time dollars are used and accumulated by time spent helping each other) is developed in the area. Do you think a program like this would help people of all incomes access the human resources needed to get to an organic garden to pick produce for a reduced cost, to receive an hour of childcare to go for a walk to the Landing or to a learning circle, etc)? (If yes) and/or (If no) Please tell me more…..

10 mins

16. Engagement with nature can motivate people to protect the environment, yet, .

(PE) Q 16: see Slide 8

i. Take the river that runs through town that is often littered with garbage, or the beach areas people like to go to, what else can we do to ensure these places stay healthy and to encourage people to take care of them?

ii. How else can we encourage people to engage in pro-environmental behaviours that help protect natural places and our health locally and globally in affordable ways? (e.g. some of participants described buying local produce, shutting off lights, using water conservatively).

10 mins

Conclusion: ***(PE) Q 17-21: see Slide 9*** 5 mins

17. Summarize the discussion and ask for any further recommendations on ways to design and implement nature-based opportunities for engagement with nature in the community.

18. Ask for suggestions on strategies and opportunities for knowledge exchange. Invite discussion on how the participants might or might not use the knowledge generated (and why or why not). Ask how this knowledge might be effectively shared with and used by others.

19. Provide handout to request feedback on methods:
    v. Was the focus group useful in examining the notion of engaging with nature in the promotion of health?
    vi. What are your comments on the use of photographs during the discussion?
    vii. Is there anything I could do differently to improve the focus group for next time?

20. Ask if they would be willing to a) receive a summary of the study and b) offer further written feedback and recommendations on the summary via email or secure website. Ask for their contact information. (use hand out)

21. Thank participants for volunteering their time and sharing their thoughts

Appendix K: Examples of Researcher Journal Entries

1) 2008-11-24: Preparing for focus groups with parents (phase1)
Query: Timing of Phase 1 focus group
Rationale:
Pros:

- in-depth analysis of the photo narration and interview data substantiates preliminary themes
- exploration/questioning of related literature has helped critique and expand preliminary themes – and this will continue in a more focused way once participants provide feedback on the preliminary themes.
- focus group questions and possible vignettes have been formulated, based on analysis of the data and literature
- the data and analysis is fresh in my mind, right now and I fear may not be so after Christmas
- the data is hopefully still fresh in the participants' minds now, and again after Christmas I suspect it will be less relevant to them and they even may be less apt to participate in the focus groups.
- the focus group discussion could be more productive if closer to the photo narration and interviews (I assume)

Cons:

- waiting until after Christmas could give me more time to examine a greater breadth of literature to expand and strengthen my themes.
- if I have the focus groups in the next few weeks participants may be more focused on Christmas-related activities and be less participatory."

Decision:
Pros out-weigh the cons - conduct focus groups with parents early Dec. instead of waiting until after Christmas

2) 2008-12-4: Notes on focus group #1 with parents
Query: Provide a hard copy of questions to those who missed the focus groups?
Rationale:
Pros:

- those absent would have another opportunity to give feedback on 1) the emergent themes; 2) the barriers and contributors to engaging with nature in the community; 3) possibilities for community-based strategies for engagement with nature to promote health; and 4) the selection of practitioners and policy-makers for the next phase of the research.

Cons

- a major goal of the FGs is to facilitate group discussion and generate data from the synergy of multiple perspectives. In gathering written feedback there would be, of course, no group dynamics or deliberation. It would like be similar data to the interviews that I have already conducted. I would also likely need to go back to ethics for permission to send participants FG questions for written feedback.

Decision:
I will wait to see what data FG#2 generates. I have already validated the photo narration themes with all participants in their interviews and have validated the overall themes with

5 of the 8 in FG #1&2. I have substantial participant feedback to support the themes. At this point, it makes sense to me to use/appreciate the data I have acquired in the FGs with parents and prepare for the phase 2 FG with practitioners and policy makers, recognizing the limitations of the attendance and data generated in 1FG #1 (Phase1)

3) 2009-5- 20: Examples of reflective notes from focus group #1 & 2 with practitioners and decision-makers

- In striving to improve on my facilitation efforts with each focus group I listened to the tapes (for instance) and decided I needed to make a more strategic attempt to go around the table and ask for specific input on what they were each doing in respective work (e.g. referring to the probe questions circulated to them prior to the focus groups). Linda's comments on social conditions registered when reviewing the tapes too, and so I also tried to probe more into equity issues in the second focus group. I am not sure if it was the composition of the groups or the probing or flow of the questions or a combination of all three, but the second focus group was distinctly more focused and more inclusive of barriers and equity issues. However, both focus groups provided very powerful data.
- The photo elicitation – ppt with photos -was very helpful to the discussion. But, particularly with the 2nd focus group, the participants carried the dialogue from slide to slide – participants themselves delved into many of the questions I wanted to ask– I made sure we were covering all the questions but allowed them to direct the flow. This helped reassure me that the phase 1 findings were very relevant to them and that we were on the right track with the questions posed to them.
- It was evident that the phase 1 findings and the questions from the revised protocol helped to generate a lot of energy and ideas for the participants in phase 2. In fact, I was shocked at how interested and keen people were to discuss and work on this topic. It was reassuring to have input from public health nurses, community health, community planning, recreation, education, community services, advocacy groups, etc…they all saw the connections, the potential and significance, shared what is currently going on, and challenged each other on the barriers.

Appendix L: Example of Progress Reports to Supervisors

Notes and follow-up from the Nov. 12th , 2008 session with supervisor:
Agenda:

- intro - study update
- tour of research site
  - audit trail, progress reports, changes to protocols, ppt, articles
- analysis and Atlas.ti
  - examples of photo narration via ppt
  - word file in Atlas.ti with pictures – examples of coding and comments (substantive)
  - interview.–coding in Atlas.ti
  - articles as text files and coding
  - code forest – depth of data
- preliminary super (theoretical codes)
- literature recommendations
- preparing for focus groups

Key discussion points and action:

1) I have explored (in participant interviews) questions around how engagement with nature influences parents' pro-environmental behaviours but need to explore this further in the focus groups – in ways that level the playing field amongst participants (- e.g. use of questions or vignettes that are tied to the interviews and that allow participants to explore what could be done). We discussed trial balloons on current environmental issues in the community (e.g. fisheries, pesticides) – but on critical after thought, I have been struggling with these types of examples – as I would like to carefully link them to the data, founded in the participants' experiences of engaging with nature – and from a health promotion perspective as well.

Action: With that in mind, I have now focused in on two avenues that could, perhaps, synergistically dovetail with my data and policy/practice scenarios:
a) The local sustainability development committee and the Atlantic Canada sustainability summit (April 2008): Resources from this committee as well ideas from our Nov 12th discussion, and further examination of the data, have stimulated me to suggest the following possibilities for questions/scenarios for the parent focus group (and possibly the policy/practitioner group):

i) how do we ensure our restorative places continue to be restorative? - especially if more people begin to access public natural areas. Take the woods paths in your backyard that you describe, or the beach areas you like to go to, who and what will keep these places healthy and accessible? What should we do individually? Collectively?
ii) how do we best discuss and share with others how our natural places enrich our family's health as well as the importance of taking care of these places? (e.g. sharing circles, information sessions, website, eco-action teams, biodiversity knowledge sharing teams…)
iii) how do we ensure that it is not just people who have money who are able to get to parks and healthy natural places?;
iv) how can we reduce our environmental footprint in everyday individual and affordable ways to ensure natural places are sustained across the globe? (e.g. even buying local produce, shutting off lights, using water conservatively)

v) how do we support others, of all incomes, in doing the same?
vi) suppose a car share program is developed in [the area], would this help people get to some of these restorative places to enrich their health, learn about and understand nature? Would this be sustainable approach? What could a car share program look like here?
vii) suppose a timebank program (time dollars are used and accumulated by time spent helping each other) is developed in [the area] – would a program like this help people of all incomes access the human resources needed to get to an organic garden to pick produce for a reduced cost, to receive an hour of childcare to go for a walk to the Landing or to a learning circle, etc)…
viii) how can we create and care for more restorative places in town – closer to work (see below for walking trail example);

b) 2008-2011 health goals developed by our community health board (CHB). The CHB's strategic direction #1 is now labeled as 'health and wellness' with one of their objectives listed as "to continue to promote and advocate for active living strategies in the community such as walking trails" – led by the Department of Recreation. I could see that my participants' data could add to this type of initiative – helping to advocate for accessible environmentally sustainable nature-based trails (with little impact on the environment). There is potential to create trails along the river that runs through town, for instance. I could ask participants if they would use this type of trail, what it might look like, as well as the feasibility, the barriers and facilitators of creating, using and sustaining such trails.

2) I need to ask parents, in the focus groups, their perspective on nature-based health promotion through community-based organizations, or camps, etc – e.g. day cares, summer camps, etc. – in the interviews we talked a bit about engaging with nature during the work day – but not about their children's engagement at day cares etc.

Action: Will ask parents a series of questions around the day care curriculum and natural environment initiatives for families and children – e.g. tell me about the options nature-based programs for children. Are they for accessible for all incomes? What are your thoughts on nature-based health promotion programming at Kid's First or the day cares for instance? Is this feasible? Who would need to be involved?

3) Preliminary super theme #3 –originally 'Sustainable health choices for families and the environment' is not clear - need to re-word again, tighten up the description.

Action: Re-titled as "Sustainable practices for nature-based health promotion"

4) Preliminary super themes #4 – 'access to nature (barrier and facilitators)' – need to include reference to data on the influence of family, friends.

Action: See re-wording of theme below

5) I need to ensure that I define each super code first and then give examples.

Action: See revised themes below

6) I need to be careful with my use of terms such as 'good', 'great' in responding to participants during the focus groups

7) Literature recommendations:

Action:
Elizabeth will see what she can send in terms of her literature on accessing nature. Patti will send Elizabeth what she can on 'place'/'restorative places'

Questions:

1) With 8 participants, data is extensive. By participant #8 I have found that incremental learning is minimal and repetition in the codes/data continues to occur. I know Tricia, you and I talked about this too, and we both thought that I had enough participants and depth of data. I do have a 9th participant who contacted me who I can pursue further if needed -but I will not plan to do that given that the sample is sufficient – is this OK?

2) If you think some of the questions/scenarios in the previous section are on the right track I could plan to meet with __ who is a key member of the Sustainable Development Committee and talk with him about what is or is intended to be underway in the area. I could also meet with a member of the CHB to see where they are at with their trail development goal. Or perhaps this is or should be part of Phase 2 focus group discussion? I would like to aim to have the focus group with parents more of exploring their ideas rather than introducing too many of my own scenarios – which will be part of the phase 2 focus groups as well. What do you think?

3) During the focus groups with parents (2 focus groups with 3-4 parents in each) I intend to do the following:

- provide an overview (with ppt and their pictures) of the central themes/super codes from the photo narration and interviews and encourage their feedback.
- focus on 5 or 6 of the questions and maybe 1- or 2 of my own scenarios (e.g. walking trail, car share) described above (otherwise will run out of time)
- request their feedback on who to include in the phase 2 focus groups – who best to exchange knowledge with (in terms of practitioners and policy makers).
- request their feedback on how I/they can exchange knowledge with others – to disseminate this knowledge with other families, etc.
- request their feedback on which pictures to take to the next series of focus groups with practitioners, etc
- request their feedback on the methods – e.g. photo narration, interviews, focus groups.

Revised Preliminary 'Super Codes' (atlas ti term) from analysis of the photo narration and interviews– see below…

1) Restorative outdoor places: Restorative places are those outdoor places that parents/families go to, that have meaning to them, and that enrich their lives. The types/qualities of favorite or preferred natural places (e.g. water, beach, lake, woods, open spaces, quietness, peacefulness, unpopulated, wildlife) create conditions for restorative experiences.
2) Restorative experiences in nature: involves firsthand experience interacting with natural environments. These are experiences that connect parents/children to the natural

world and to each other and that are health promoting– e.g. outdoor activities that take them 'away' from the stress of work or at-home duties; varying experiences like hiking in the woods, picking berries, walking on the beach or in a field, sitting by the fire - while conversing with each other, imagining, appreciating, playing, learning.

a) Individual and family enrichment (sub theme): enrichment is an outcome of engaging with nature and each other. Parents suggest that engaging with nature fosters a sense of mental and physical well being, helps them focus on their priorities, and creates opportunities to talk and connect with other family members.

b) Valuing nature (sub theme): valuing nature develops through discovery and play as parents and their children engage with, appreciate, and learn about nature. Parents' express their appreciation of plants, animals, the cycle of life, and the opportunities to work or play together with other family members to grow gardens, look for pollywogs, stack wood, get water, walk through a field on the way to the store, buy local produce. Parents talk about the connections between the health of nature and their family's health.

3) Sustainable practices for nature-based health promotion:

Engaging with nature in the promotion of health is sustainable in this case because it 1) is feasible for families, 2) is feasible for the community, 3) has minimal environmental impact, and 4) can influence pro-environmental behaviours. Parents in the study describe nature-based health promotion as the simple but profound everyday activities that do not pose an economic burden for them or the community –activities that do not require a membership to a gym, a wellness centre, or other built structures for instance, and that have very little impact on the environment. Parents may have a garden, play outside with their children, walk in the woods, go to the park, feed and learn about animals, use the clothes line, limit their footprint because they believe it is good for their health, their families' health, and/or the health of the environment. However, parents tell of a dilemma that if we encourage more people go to outdoor public places (e.g. the Landing, Brown's Mountain), the impact on the environment could increase and the restorative qualities of these places could change (become more populated, with more noise, more litter, etc).

4) Access to nature (barrier and facilitators):

A facilitator of parents' engagement with nature is their access to nearby nature – whether in their backyard, at a family farm, or community garden. Nature is accessible to all participants by walking or biking from their home (woods paths, community garden, Landing). The town and county has many potential access points. Parents' engagement with nature is influenced by their desire to be in the natural environment, knowing where to go (the options), being able to get there (e.g. vehicle or on foot), and a match between the qualities of accessible natural places and the individual/family's desire for solitude, view, etc. Motivation to engage with nature can stem from prior life experiences (e.g. as a child) and is influenced by family and friends and knowledge about health and nature. Barriers include lack of motivation, time, knowing where to go, and safety. In the county rural areas for instance, road safety (e.g. traffic and conditions of the shoulder of the road) and fear of bears and other wildlife keeps some of the parents from walking along the road. The lack of bike trails in rural areas and in town is also considered a barrier by several parents.

Appendix M: Phase 1 Information Letter and Consent Form

Information Sheet for Parents

Title of Research Study: Engaging with Nature: A Participatory Study in the Promotion of Health.

Co-Principal Investigator: Patti Hansen-Ketchum RN, PhD student, University of Alberta

Principal Investigator (Supervisor): Dr. Patricia Marck, University of Alberta & Royal Alexandra Hospital

Background: I (Patti Hansen-Ketchum) am doing this study as part of my PhD program. I am interested in understanding more about how parents engage with nature to promote their own and their families' health. I hope that this information will be helpful in creating health promotion opportunities for the community. This research has been reviewed and approved by the Health Research Ethics Board of the University of Alberta and the Guysborough Antigonish Strait Health Authority (GASHA) Research Ethics Board.

Purpose: This research study uses photographs and discussions to better understand how parents engage with nature to promote health.

Procedures: If you participate in this study, you will be asked to:

a) Take pictures of your engagement with nature and/or the barriers and opportunities for engaging with nature in your community, over a period of 2 weeks (a recyclable camera will be provided).

b) Write down or talk about these pictures as you take them (a recorder will be provided if you prefer to talk rather than write your thoughts).

c) Participate in one tape-recorded interview to discuss your photos. This will last about 60-90 minutes.

d) Participate in one group discussion with other parents. This will last approximately 60-90 minutes.

e) Provide feedback and recommendations on the overall findings. This can be done in writing, secure website or email.

You will receive Farmer's Market dollars in appreciation of your participation in the study. Farmer's Market dollars will be given to you following the interview and again following the focus group discussion.

Possible Benefits: This research project will enable you to use photographs and talk about your engagement with nature in your community. The information you share will help us understand the barriers and opportunities for engagement with nature and the promotion of health in your community. Your input will be helpful to health practitioners and decision-makers in understanding opportunities for health promotion.

Possible Risks: It is not expected that you will suffer any risks from participating in this study.

Confidentiality: All documents and information relating to this study will be kept confidential. The interview and group discussions will be tape recorded. Any research data collected about you during this study will not identify you by name, only by a coded number. Your name will not be disclosed outside the research study. Any report published as a result of this study will not identify you by name. While I will do everything possible to protect the confidentiality of what you have said, I cannot guarantee that others in the focus group will do so. You will be asked to select 2-3 photographs that you have taken so that the researcher can share them with other parents during the group discussion. These same photos may also be used later during the researcher's group discussion with practitioners and decision-makers. As part of our ongoing research, I will keep all audio tapes, group notes and photographs in my secure archives, which are only accessible to the research team. After a period of 5 years the data files may be destroyed. I may wish to use the research findings in later studies; any use of these research findings in further studies will only occur after review and approval by the Health Research Ethics Board of the University of Alberta and any other relevant review boards.

Voluntary Participation: Your attendance is voluntary. You will not be penalized in any way if you choose not to take part in the research study. You will be reminded of this each time we meet. You can drop out of the study at any time.

Contact Names and Telephone Numbers:

Please contact any of the individuals identified below if you have any questions about the study:

Patti Hansen-Ketchum, Co-Investigator	**902-967-5027**
Dr. Patricia Marck Principal Investigator	780-492-2109

If you would like to talk with someone not directly involved in the study about any concerns you may have, you can contact:

Dr. Christine Newburn-Cook, RN PhD Associate Dean, Research Associate Professor, University of Alberta	(780) 492-6764

CONSENT FORM

Title of Project: Engaging with Nature: A Participatory Study in the Promotion of Health.

Co-Principal Investigator: Patti Hansen-Ketchum **Phone Number:** 902-867-5027
Principal Investigator: Dr. Patricia Marck **Phone Number:** 780-492-2109

Part 2 (to be completed by the research participant):

	Yes	No
Do you understand that you have been asked to be in a research study?	☐	☐
Have you read and received a copy of the attached Information Sheet?	☐	☐
Do you understand the benefits & risks involved in taking part in this study	☐	☐
Have you had an opportunity to ask questions and discuss this study?	☐	☐
Do you understand that you are free to withdraw from the study at any time, without having to give a reason and without affecting your work?	☐	☐
Has the issue of confidentiality been explained to you?	☐	☐
Do you understand who will have access to your records?	☐	☐
Can any of the information you provide be used in further studies?	☐	☐

Who explained this study to you?
_____

I agree to take part in this study: YES ☐ NO ☐

Signature of Research Participant_____
(Printed Name) _____
Date: _____

I believe that the person signing this form understands what is involved in the study and voluntarily agrees to participate.

Signature of Investigator or Designee _____ Date _____

THE INFORMATION SHEET MUST BE ATTACHED TO THIS CONSENT FORM AND A COPY GIVEN TO THE RESEARCH SUBJECT

Appendix N: Phase 1 Photo Self-reflection Log Chart for Participants

Research Study: Engaging with Nature: A Participatory Study in the Promotion of Health.

PHOTO 1 **Camera picture # ___**

a) **Brief description of photo:**

_____

_____

b) **Approximate location:**

_____

c) **I took this picture because:**

_____

_____

_____

_____

PHOTO 2 **Camera picture # ___**

a) **Brief description of photo:**

_____

_____

b) **Approximate location:**

_____

c) **I took this picture because:**

_____

_____

_____

PHOTO 3 **Camera picture # ___**

a) **Brief description of photo:**

_____

_____

b) **Approximate location:**

_____

c) **I took this picture because:**

_____

_____ **ETC.**

Appendix O: Self-reflection Questions and Summary for Participants Prior to Phase 2 Focus Groups

Research Study: Engaging with Nature: A Participatory Study in the Promotion of Health.

⇨ ***I would appreciate if you could spend some time thinking about these key questions before our scheduled focus group discussion:***

1) Can you tell me how you see the relationship between nature and the promotion of health?

2) Do you think we are doing enough to enable people to engage with nature in the area? How so?

3) Do you think there are ways we can each enable engagement with nature through our work with individuals, families, and/or community?

4) What do you see as the supports and resources for designing and implementing health promotion interventions that enable engagement with nature in [the area]?

5) What do you see as the challenges and barriers in designing and implementing health promotion interventions that enable engagement with nature in the community?

⇨ **Overview of findings to date** - ***these are the key areas of nature-based health promotion that parents have talked about:***

Restorative Outdoor Places

- places that have favorite or preferred qualities (e.g. view of the water, open spaces, quietness, peacefulness, unpopulated, wildlife) and that provide conditions for restorative experiences.

Restorative Experiences in Nature

- experiences that connect parents/children to the natural world and to each other and that are health promoting– e.g. outdoor activities that offer stress relief and time to connect with love ones.

Sustainable Practices for Nature-based Health Promotion

- simple but profound everyday activities that:
  - are feasible for families,
  - are feasible for the community,
  - have minimal environmental impact
  - support pro-environmental behaviours.

Access to Nature (barriers and facilitators)

- access to nearby nature
- desire/motivation to be outdoors
- knowing where to go (the options)
- being able to get there (e.g. vehicle, bike, on foot)
- a match between the qualities of accessible natural places and the individual/family's desire for solitude, view, etc.
- safety of natural places
- distraction of technology

Fostering Ecological Citizenship through Engagement with Nature

- engagement in everyday personal and professional activities that promote and protect the bonds between people and the natural environment
- developing awareness and values about health and nature

Appendix P: Phase 2 Information Letter and Consent Form

Information Sheet for Practitioners and Decision-makers

Title of Research Study: Engaging with Nature: A Participatory Study in the Promotion of Health.

Co-Principal Investigator: Patti Hansen-Ketchum RN, PhD student, University of Alberta

Principal Investigator (Supervisor): Dr. Patricia Marck, University of Alberta & Royal Alexandra
Hospital

Background: In the first phase of this research I examined how parents engage with nature in their community and the barriers and opportunities they see there. I now hope to share these findings with health practitioners and policy-makers to learn more about designing and implementing nature-based health promotion interventions in the community. This research has been reviewed and approved by the Health Research Ethics Board of the University of Alberta and the Guysborough Antigonish Strait Health Authority (GASHA) Research Ethics Board.

Purpose: The purpose of this research is to better understand how people engage with nature to promote their own and their family's health as well as the barriers and opportunities for engaging with nature in their community. You are being asked to share what you see as the supports, challenges and opportunities for designing and implementing related community-based health promotion interventions.

Procedures: If you participate in this study, you will be asked to:

a) Participate in one group discussion with other health practitioners and policy-makers. This will last approximately 1 to 1½ hours.
b) Provide feedback and recommendations on the summary of themes identified from the focus group discussion. This will be done via secure website or email.

You will receive Farmer's Market dollars in appreciation of your participation in the study. Farmer's Market dollars will be given to you following the focus group discussion.

Possible Benefits: This study will help us identify and discuss the barriers and opportunities for engagement with nature and the promotion of health in your community. Your input will help us to better understand and create opportunities for nature-based health promotion.

Possible Risks: It is not expected that you will suffer any risks from participating in this study.

Confidentiality: All documents and information relating to this study will be kept confidential. The group discussion will be tape recorded. Any research data collected about you during this study will not identify you by name, only by a coded number. Your name will not be disclosed outside the research study. Any report published as a result of this study will not identify you by name. While I will do everything possible to protect the confidentiality of what you have said, I cannot guarantee that others in the group will do so. As part of our ongoing research, I will keep all audio tapes, group notes

and photographs in our secure archives, which are only accessible to the research team. After a period of 5 years the data files may be destroyed. I may wish to use the research findings in later studies; any use of these research findings in further studies will only occur after review and approval by the Health Research Ethics Board of the University of Alberta and any other relevant parties.

Voluntary Participation: Your attendance is voluntary. You will not be penalized in any way if you choose not to take part in the research study. You can drop out of the study at any time.

Contact Names and Telephone Numbers:

Please contact any of the individuals identified below if you have any questions or concerns about the study:

Patti Hansen-Ketchum, **Co-Investigator**	**902-967-5027**
Dr. Patricia Marck Principal Investigator	780-492-2109

If you would like to talk with someone not directly involved in the study about any concerns you may have, you can contact:

Dr. Christine Newburn-Cook, RN PhD Associate Dean, Research Associate Professor, University of Alberta	(780) 492-6764

CONSENT FORM

Title of Project: Engaging with Nature: A Participatory Study in the Promotion of Health.

Co-Principal Investigator: Patti Hansen-Ketchum **Phone Number:** 902-867-5027
Principal Investigator: Dr. Patricia Marck **Phone Number:** 780-492-2109

Part 2 (to be completed by the research participant):

	Yes	No
Do you understand that you have been asked to be in a research study?	☐	☐
Have you read and received a copy of the attached Information Sheet?	☐	☐
Do you understand the benefits & risks involved in taking part in this study?	☐	☐
Have you had an opportunity to ask questions and discuss this study?	☐	☐
Do you understand that you are free to withdraw from the study at any time, without having to give a reason and without affecting your work?	☐	☐
Has the issue of confidentiality been explained to you?	☐	☐
Do you understand who will have access to your records?	☐	☐
Can any of the information you provide be used in further studies?	☐	☐

Who explained this study to you?
_____

I agree to take part in this study: YES ☐ NO ☐

Signature of Research Participant_____
(Printed Name)

_____
Date: _____

I believe that the person signing this form understands what is involved in the study and voluntarily agrees to participate.

Signature of Investigator or Designee_____ Date _____

THE INFORMATION SHEET MUST BE ATTACHED TO THIS CONSENT FORM AND A COPY GIVEN TO THE RESEARCH SUBJECT

Appendix Q: Final Summary of Themes for Final Feedback from Participants

Thank you again for your participation in the study. When we met last, you expressed an interest in providing feedback on the analysis of the study findings. I have since analyzed the focus group data and have created a very condensed overview of the themes. I would appreciate if you could reflect on the overview below and then respond to the questions that follow.

Overview of Phase 1 &2 Findings:

1) Restorative outdoor places are valued as health promoting
Restorative outdoor places are those that have favorite or preferred qualities (e.g. access to water, open spaces, gardens, woodlands, quietness, peacefulness, wildlife). These places provide natural conditions for restorative experiences that can promote health.

"Just as important as being on our bicycle is where we were riding. This is the only bicycle friendly trail in [the area] and, fortunately, is quiet, scenic, and natural." P1Pic13PN

"*It's also a place like if, I'm stressed out about something I'll go for a walk up there and it clears my mind, um makes me refocus on the important things and forget the trivial things in life and ah, it's also a great place." Int. P3*

2) Restorative experiences in nature are simple, profound, and enriching
Restorative experiences involve interacting with nature in outdoor places in ways that connect people to the natural world and to each other and that are health promoting. Participants suggested that engaging with nature fosters a sense of mental, spiritual, and physical well being, helps them focus on their priorities, creates opportunities to talk and connect with others, and enables them to understand and appreciate the natural world.

"I was saying to my husband that…first of all walking and using some of the trail systems, and just having that time in between, I call it like a segment, so say, if I'm going to the University and, I'm walking to the University, I use that walking time out in nature to just segment and wind down and really get clear and focused for myself mentally and being more focused on my task. So it gives me that clarity" Int. P4

"*It shows that we don't always need fancy playground equipment…kids see a pile of dirt as a mountain to climb…and then it turns into a slide…children's imaginations come alive in nature… Fresh air and physical activity usually means the kids will eat a good supper and have a good sleep" P6Pic5, 8PN*

3) Engaging with nature develops ecological citizenship

Ecological citizenship is tied to how we connect to, experience, and care for the natural world including our shared restorative places. It involves the sustainable ways we can protect both the planet and the lives of future generations. Not only did participants point to sustainable practices in describing their engagement with nature, they also considered these practices as important pieces to understanding the need to care for and protect the natural world. For instance, participants described restorative experiences as activities that are feasible for themselves (e.g. no membership fees), feasible for the community, have minimal environmental impact, and that support pro-environmental behaviours (e.g. walking or biking instead of driving, using the clothesline, growing and picking local produce). Participants also identified the need for individuals, families, educators, practitioners and policy makers to strengthen community-based access to restorative places and experiences.

"…it's just knowing that we live right by a river… nature around us…we've changed since we've moved to our house, we've changed our cleaning products and dish washing products to vegetable based…And when I buy those things, I'm thinking of my immediate surroundings, at what's going through the drain, and 'cause, uh, my kids will say, 'Oh, I wanna build a house right over there', so you think ahead to generations. Whether he does or he doesn't, somebody will, you know. So I'm thinking of the ground water. Yeah, so being there and valuing where you live and feeling a part of where you live does have an impact." 1FG1

"I think at schools too, I look at the elementary school and just because my son is there now but it's so barren…The playground … why don't they have fruit trees, I mean there's apples for the kids, right? You know once they [trees] get bigger and you know a few years down the road … it would provide shade…Which is great because on the sunny days they are totally exposed, right…It would be good learning for them to be part of it, or and then community gardens … I mean to have them in on community gardens just in and around the town, there's lots of space….Engaging in that is really huge." 1FG2

4) Access to nature is shaped by multi-level barriers and facilitators

Access to restorative places and experiences is shaped by a complex array of barriers and facilitators. At the individual and family level, participants described engagement with nature as influenced by factors such as the individual/family's understanding of and

desire to be in the natural environment, restorative places nearby, knowledge of where to go (the options), ability to get there (e.g. vehicle, bicycle, or on foot), support networks, prior life experiences, and a match between the qualities of accessible natural places and the individual/family's desire for solitude, view, activity. For practitioners and policy makers, the barriers and facilitators to creating community-based access to nature were also complex and multi-sectoral and related to the processes of integrating knowledge about health and nature into practice and policy, garnering support and participation from both multi sectoral colleagues and intergenerational community citizens, developing ecologically-sound infrastructure, and acquiring human and financial resources.

"Not many people know those trails are here and they take you along some great trails and very scenic trails. Great place for exercise. Very quiet, peaceful and lots of wildlife." P8Pic15 PN

"I was going to say if like you're building a road how much more is it to really add a little side slab, right, off the side of the road to build [for walking and biking]. Especially when you're moving dirt. And a lot of times like, they are taking that extra fill and looking for places to dump it because they have nowhere to put it….Yeah, it does take community initiative, for something like that." 1FG1

" My concern in education too now is, is the, the cutting back of phys ed teachers and I mean, a classroom teacher can only do so much but phys ed teachers take a lot of the outdoor ed and they do a lot of the GPS exploring, they go out in nature and, and you know they take the kids out. And those are the first positions that are cut." 2FG2

5) Examining norms in practice and policy is an important first step in creating access

To enable access to restorative places and restorative experiences, and to foster ecological citizenship we need to consider the norms in practice and policy that enable or disenable nature-based health promotion in our community. Norms in this case are the often taken-for-granted, expected ways of doing things influenced by our social, cultural, political, and economic context. Examples of these norms identified by participants include the common emphasis on growing urban versus rural resources for health, costly problem-focused programming and service delivery, and working in individual silos. These norms may or may not be consistent with our values and beliefs about human health and the environment. For instance, participants emphasized the value of nature-based restorative experiences and the importance of creating ecologically-sound access to nature but articulated that it was not the norm in many sectors to consider options for nature-based health promotion or work with others in this area. Data points to a need to continue to identify which norms are preventing us from promoting human and ecosystem health and to rethink and inspire new norms that enable us to create community-based conditions for ample daily access to nature. Change begins when our sensitivity to human and ecosystem health strongly influences our work, when we

recognize that we each have a role in human and ecosystem health promotion, and finally, when we begin to bridge silos between and among sectors and community citizens in our work.

"Well just from a health perspective again I think if we reinforce the value [of engaging with nature] and when we're looking at the cost of things and limited resources again having an impact on the, the so-called bottom line and we're talking to politicians around where our resources should be allocated. And looking at, again, the value of walking and biking, I mean, I just know from my experience that there's nothing better we can do. We don't need a lot of techniques or types of equipment or whatever. Get out in nature have a walk or go for a bike ride. So those kinds of things cumulatively have an impact on the quality of our health and reduce the risk of disease and so on." 2FG1

"As a piece there but I think it has a lot to do with our culture and with the way we do things. So it needs a whole shift from…just in intervention because we could go out and try and teach and put in as many programs as we wanted to but until the environment is there for people to actually go out and interact with nature, they won't be able to and that's a culture shift." 2FG2

"You know…iIt's been a bit of a frustration all around because everybody has a piece for the puzzle but nobody was uniting to put those pieces together and it's really, really exciting to make those first steps" 2FG1

6) Inter-sectoral governance can facilitate community-based change for human and ecosystem health

Data suggest that inter-sectoral governance may be a contemporary means of creating and sustaining on-going change within the community. In other words, this theme provides insight into the processes needed to address human and ecosystem health across sectors. Participatory inter-sectoral governance is an inclusive and shared process that seeks voices, ownership, and involvement from diverse sectors and from all citizens including disadvantaged groups (e.g. lower income, minority groups, rural citizens). In contrast, participants discussed examples of current silos of work happening among various sectors. For instance, the renewal of highway infrastructure has occurred in many places yet the shoulders of many rural roads and bridges still remain unsafe and not conducive modes of active transportation like walking and biking along some of the most beautiful coastal areas of Nova Scotia. New schools have been created in places with very little access to nature or to walking trails for use to and from school. Current decision making tools, processes, and plans of action could be strengthened across sectors by: 1) collaboration among sectors and dove-tailing initiatives; 2) requisite attention to the promotion and protection of both human and ecosystem health; 3) citizen engagement

and participation in decision-making and action. These 3 central processes of participatory governance may help revitalize our embedded norms and support progress toward diverse and integrative ways to engage with nature in the promotion of health.

"Um other barriers…that I jotted down. School board requirements for citing of schools mean that they're always put somewhere where no one will walk to them. … Because they have to be so large now that they end up on the outskirts somewhere. Um and that's I think that needs to be looked at." 2FG2

"…It'd be nice too, to find a way to target those families that are at risk…That, um, you know, have a harder time getting out and, for whatever reason." 2FG1

"Well I think giving them ownership, you know involving them in the process. You're going to protect the things that mean something to you. So that if you're engaged with the seniors, that gives you a whole new perspective on seniors and… Or, you know, you're involved in creating that park or that green space then that becomes very personal and something that's important to you. So I certainly think finding ways to engage in people in the project, involving them in the actual hands on doing it." 2FG1

Your responses are appreciated and valued!

Questions for parents:

1) How do these themes fit (or not) with your thoughts and experiences?

2) What is missing?

3) Is there any other feedback or additional recommendations you would like to provide?

Questions for practitioners and decision-makers:

1) Can you tell me how theme # 4 *'***Access to nature is shaped by multi-level barriers and facilitators'** reflects or does not reflect what we discussed in our focus group?

2) Can you tell me how theme #5, **Examining norms in practice and policy is an important first step in creating access***'*, reflects or does not reflect what we discussed in our focus group?

3) Can you tell me how theme #6, *'***Inter-sectoral governance can facilitate community-based change for human and ecosystem health'**, reflects or does not reflect what we discussed in our focus group?

4) What do you think is missing overall?

5) Is there any other feedback or additional recommendations you would like to provide?

Appendix R: Examples of Feedback from Participants on the Final Summary of Analytic Themes

Questions (practitioners and decision-makers)

1.Can you tell me how theme # 4 'Access to nature is shaped by multi-level barriers and facilitators' reflects or does not reflect what we discussed in our focus group?

P2FG1: *"Accurately reflects. Although it is true some of the more disadvantaged families may be limited to access due to transportation most are not."*
P2FG1: *"The group talked about how people need better access to nature. This access included knowledge of what options(activities) are available to people. Knowledge of restorative places is the first step to overcoming the barriers and can lead to community initiative. Benefits of community initiative is well highlighted especially the piece about the policy making level."*
P2FG2: *"I recall that in our focus group we talked about access to nature as a privilege. We had a small debate concerning how people preferred to spend their time, resources and money. The majority of people without means would own a TV and other luxury items before they would invest in a kayak, for example. We discussed the poverty that exists in our area, and how restorative outdoor places and experiences needed to be made more accessible to people without means or access to transportation. We did not come to any conclusions as to why "access to nature" was more important for some individuals than others. We did talk about the need to educate people about the health benefits of restorative places. Nature based health promotion and ecological citizenship required active facilitation on the part of parents, teachers, community leaders, positive media images, etc. Ecological citizenship was highlighted as a value we needed to "sell" to others; however, often this value was not given the priority it deserved. Children needed to learn the importance of ecological citizenship through active participation in outdoor education experiences and in the classroom. I'm not sure this answers your question."*
P2FG2: *"I feel this does reflect what was discussed; particularly the description of human and financial resources as barriers and facilitators. Often what we need most is support to coordinate existing resources."*

2.Can you tell me how theme #5, Examining norms in practice and policy is an important first step in creating access', reflects or does not reflect what we discussed in our focus group?

P2FG1: *"Accurately reflects."*
P2FG1: *"This theme accurately reflects our discussion around status quo. You mention the shift in values(intervention to promotion) and give very good examples of what this would look like. I really like how you used the final quote to show where and how this change can happen."*
P2FG2: *"Examining norms in practice and policy was an important first step in creating access because our focus group thought we needed to start with ecological literacy. Many individuals were unaware of the health benefits of nature. Perhaps their economic, social or cultural experiences to date had not given them opportunities to appreciate nature's restorative value. Access to nature needed to be equally available to all regardless of individual or family circumstances. Critically examining the norms in*

practice and policy could cause local government officials and others in authority to create fairer and more inclusive policies and practices."
P2FG2: "*I feel it reflects what was discussed in the focus group. We live in a small town where we seem to continue to do things because they are just the way they have always been done. I think we are seeing though the beginnings of this required shift. People are starting to work together across silos particularly around the broad area of sustainability which crosses a number of sectors, capacities, and needs."*

3.Can you tell me how theme #6, 'Inter-sectoral governance can facilitate community-based change for human and ecosystem health', reflects or does not reflect what we discussed in our focus group?

P2FG1: "*Accurately reflects."*
P2FG1: *"I like your analysis of this theme. I think you did a good job of demonstrating how inter-sectoral governance processes can affect multi-system change. While it may be complex it is achievable."*
P2FG2: *"This statement reflects the discussion in our group because we decided that collaborative partnerships between government and community-based organizations were essential. Many positive initiatives were currently taking place in [the area], but for these to take hold, all sectors of the population needed to be involved. The next priority after examining current practices and policies would be to rewrite or create new mandates and mission statements. The idea was that we all needed to start caring about our environment together. At this point, we diverged and talked about creating/preserving a positive legacy for our children"*
P2FG2: *"This is also a great reflection of what was discussed. There are so many opportunities to increase opportunities for nature based health promotion. We need to capitalize on these opportunities and coordinate across sectors for meaningful change. It is also critical to meaningfully engage those who have barriers to accessing these opportunities."*

4.What do you think is missing overall?

P2FG1: *"The main barrier to actual usage of these areas is other so called demands on the individuals /family's time. Such as X-box,tv,internet, parental insistence in overseeing children's play."*
P2FG1: *– "No"*
P2FG2: *– "I think the fact that restorative outdoor places and restorative experiences are health promoting, profound and enriching is evident. I also believe that engaging with nature develops ecological citizenship; however, I still think access to this knowledge and experience is not socially equitable. For the most part, the most privileged among us are often the ones with the leisure and means to benefit most from the natural world. I think we need to address social, cultural and economic inequities that make enjoyment of nature a luxury for the few. Enjoying the outdoors is often expensive; getting to beautiful places often requires a vehicle. The people in __ who live in the trailer parks do not have easy access to water, open spaces, gardens, woodlands, quietness, peacefulness, wildlife."*
P2FG2: *"N/A"*

5. Is there any other feedback or additional recommendations you would like to provide?

P2FG1: *"The towns of __ and __ have developed "The Trail" which is a combination of sidewalks and trails along the River. It would be wonderful to see the __ Brook or River developed in the same manner."*
P2FG1: *"Your use of examples is very helpful to describe and support your arguments. I think you've done an excellent job of showing how progressive actions (many examples of this) lead to health promotion."*
P2FG2: *" Thank you for inviting me to participate. I think your project is a very worthwhile one."*
P2FG2a: *"N/A"*

Questions (parents)

1. How do these themes fit (or not) with your thoughts and experiences?

1-PN/Int: *"These themes fit very well with my thoughts and experiences. Identifying the importance of engagement with nature as a means of health promotion is crucial to people making that engagement. The themes you've outlined illustrate that the participants in your study do see the value in engaging with nature. I think your results will be informative, to others, on the importance of engaging with nature. I think the themes you've explored show that interacting with one's natural environment can be simple and instinctual, yet not always easy in the context of our society. There are sometimes physical and political barriers to communing with nature. By facilitating (through policy, infrastructure, etc.) access to nature, communities can increase the well being of individuals, and the community as a whole. I think this notion comes through in the responses of the study participants."*
1P-PN/Int/P1FG: *"The report looks good to me."*
1P-PN/Int: *"I think it does fit with what we had discussed. It takes planning from all involved (construction, town planners, government funding etc) to ensure that areas for physical well-being are created and maintained in urban planning. I also agree that fancy playgrounds are not the answer; children need spaces to cultivate their imagination and creativity. Walking trails and green space are a great suggestion. Giving families opportunities to explore in nature also promoted environmental awareness and a great step to creating ecological-aware citizens."*
1P –PN/Int/FG2*: "These thoughts [themes] are in alignment with my thoughts on engaging with nature"*
1P–PN/Int/FG1: *"Very closely -- reading the themes brought me back to personal experiences and thoughts related to the health benefits (physically, mentally, emotionally, socially, spiritually) of engaging with nature."*
1P-PN/Int/FG2: *" I think all these themes fit with my thoughts and experiences related to this study. I think we live in such a busy, technologically-focused, stressed world that people need to take breaks and get away from it all. Engaging with nature helps with stress, aids in refocusing on positive aspects or just allowing one to focus inward. These natural settings are restorative, peaceful and for me, a necessity. Unfortunately, there are barriers to being able to fully participate in some activities or engage with nature. Some workarounds are simple and hopefully will be put in place in our area so more are able to take advantage. I should point out, that there is a small, somewhat selfish side of me that doesn't want to share some of these spots I frequent. I don't begrudge anyway the opportunity, just not at the same time that I do necessarily when I*

need 'me' time. When getting out at other times, such as running, family events etc, I think it's wonderful to see the growth in outdoor activity and am proud to see that transition. It seems to be a bit slower to catch on here on the East coast but don't count us out yet. Slowly, people will come around and see the positive impacts of engaging with nature. As more 'green' initiatives go forward and our children are brought on board things will be different. Starting early so they will be able to teach and inspire others is an important part of this process. Small changes can have big impact."

2. What is missing?

PN/Int: *"I can't think of anything that is missing. I'm confident that you've covered the bases."*
1P-PN/Int - *"I really can't think of anything. What about the idea of creating community gardens. They promote healthy living and gardening is a great form of physical activity. Plus, there are economic advantages and are especially beneficial for areas of lower income families."*
1P –PN/Int/FG1: *"was not able to think of anything that's missing"*
1P-PN/Int/FG2: *"I can't think of anything right off…"*

3. Is there any other feedback or additional recommendations you would like to provide?

1P -PN/Int: *"I think you've chosen an interesting and important topic to investigate. It was a pleasure to be part of the project. I hope your findings will be well received by a large audience. If there's anything else I can do to help, don't hesitate to contact me."*
1P-PN/Int: "*I found it to be a great discussion (I was not part of a focus group) and it really brought to the forefront in my mind the importance of exposing my children to the great outdoors for their well-being in terms of mental and spiritual growth, creating healthy lifestyles and creating a sense of ecological awareness"*
1P –PN/Int/FG1 *"I think i mentioned this before but sharing the results of your research with local organizations working in health promotion -- public health, primary health care etc."*
1P-PN/Int/FG2: *"I found this study very interesting and was glad to be able to be a part of it. I heard a lot of great ideas/thoughts from participants when I was at the session. I hope that our community (and beyond) continue to grow and enhance that which we already have."*

Appendix S: Procedure for the Analysis of the Written and Visual Data

Phase 1 & 2 Sources of Data:

- Photo-narration data:
  - Participant self-reflection chart and/or transcripts of digital record
  - Photographs
- Interview and focus group transcripts and field notes

Data Analysis Tools:

- Substantive and theoretical coding
- Dialectical analysis
- Data management capabilities of atlas.ti
- Memoing
- Researcher reflexive journaling

Phase 1 & 2: Analytic Steps in Atlas.ti

1. Created a new hermeneutic unit in Atlas.ti. This unit housed all data and tracked analysis processes.
2. Assigned the following documents to the unit as they became available:
   a. Transcript data (.rtf files)
   b. Photo logs from participants
   c. Photographs
3. Read each document, examined pictures and assigned codes to select passages and pictures. Codes were used to categorize the data at different levels of abstraction. They were short, concise labels Primary substantive codes are linked directly to quotations. Super codes combined dseveral lower level codes and were at a more theoretical level of abstraction.
4. Wrote memos about the data as I coded. This helped me draw the connections among codes and capture/stimulate my analytical thinking.
5. Based on the codes and memos, compared and contrasted data segments.
6. Explored relevant literature to examine the dialectic among emergent codes.
7. Built interrelated families of codes for Phase 1 & Phase 2 data and examined linkages.
8. Compiled on-going written reports on codes and memos for examination by supervisors and participants (during focus groups).
9. Created ppt documents for presentation during Phase 1 & 2 focus groups.

Phase 1 Steps:

Analysis of Participant Self-Reflection Logs

1) Parents' self-reflection logs and/or transcripts of their digitally recorded reflections and their associated photographs were assigned a number specific to that participant.

2) As self-reflection logs/transcribed digital records and photographs became available I read/reviewed them several times and began to code the written text and photographs by highlighting significant passages. I used the memoing function in atlas.ti to track the rationale for my coding, including my thoughts on the linkages between codes from any previous data and the convergences and divergences with a priori theory.

Analysis of Interview Data

3) Each interview data file was assigned a number, transcribed and saved as a MS Word document and a text file (.rtf) for atlas.ti.

4) As the interview transcripts became available I independently read and re-read each file and began preliminary substantive and theoretical coding in atlas.ti. Photographs were be linked to the codes during analysis. I compared, contrasted, and linked to/expanded codes from any previous Phase 1 data and a priori theory.

5) I printed regular reports of my data analysis and met with supervisors to discuss and examine them

6) The themes and select photographs were used to further develop the focus group guidelines.

Analysis of Focus Group Data (Parents)

7) Each focus group data file was assigned a number, transcribed and saved as a MS Word document and a text file (.rtf) for atlas.ti.

8) Once the focus group transcripts became available independently read each file and re-read and began coding in atlas.ti. Photographs were linked to the codes during analysis. I compared, contrasted, and linked to/expanded codes from any previous Phase 1 data and a priori theory.

9) I will print reports of my data analysis from atlas.ti and meet with supervisors to discuss and examine it.

10) The interview and focus group themes and select photographs were then summarized and used to: a) identify practitioners and policy-makers for Phase 2; b) further develop Phase 2 focus group guidelines; and 3) facilitate the focus group discussion with participants.

<u>Phase 2 Steps:</u>

Analysis of Focus Group Data (Health Practitioners and Policy-makers)

1) Each focus group data file with was assigned a number, transcribed and saved as a MS Word document and a text file (.rtf) for atlas.ti.

2) Once the focus group transcript data became available I independently read each file and began coding in atlas.ti. Photographs were linked to the codes during analysis. I compared, contrasted, and linked to/expanded codes from any previous Phase 1 data and a priori theory.

3) I printed reports of my data analysis met with supervisors to discuss and examine them.

4) The focus group themes and select photographs were then summarized into an executive summary. Further questions for participants were developed. The summary and any additional questions was then given back to Phase 1 & 2 participants to elicit final feedback.

Analysis of Feedback on Summary Document

5) Participant feedback was saved as a MSWord doc and text (.rtf) file for atlas.ti

6) Once this final participant data became available I independently read and re-read the feedback and coded in atlas.ti. I compared, contrasted, and linked to/expanded codes from previous Phase 1 data and a priori theory.

7) I printed a report and met with supervisors to discuss the feedback.

Analysis of the Whole

8) Data from Phase 1 and 2 were compared and contrasted and examined for relationships between codes, areas of convergence and incongruity, and linkages to and discrepancies with the literature and existing theory. Final recommendations for practice and policy were based on the analysis of the overall data from Phase 1 and 2.

Appendix T
Code List-Filter: All

access	physical activity	learning about nature
appreciating nature	political motivation	creating shared resources (restorative approach)
barrier to engagement	positive qualities of the location	ecological citizenship
caring for nature	previous life experiences/ influences	sectoral and community integration
parenting and lifestyle	pro-environmental behaviour	cultural shift...change
connectedness	provincial park and nature-based activities	dove-tailing other initiatives
contemplating nature	recognizing reciprocity	ecological health for all
creating shared community resources	respect for nature	participatory decision-making/citizen engagement
creativity and imagination	restorative experience	political process/policy change
day care programming	restorative places	ripple effects...economic, sustainability
public school programming	negative qualities of the location	socio ecological thinking
earth's resilience	nutritional and enjoyment value	examining norms in practice and policy
ecological sensibilities	intergenerational connections	intersectoral governance
effects of study	shared resources	working outside
family activities	sustainable practices	food source
family enrichment	use of natural resources	health and well being
home design	favorite place	increasing awareness
nature-based play		

Appendix U: Information Sheet and Consent Form (for anyone included in photographs)

Title of Research Study: Engaging with Nature: A Participatory Study in the Promotion of Health.

Co-Principal Investigator: Patti Hansen-Ketchum **Phone Number:** 902-867-5027

Principal Investigator: Dr. Patricia Marck **Phone Number:** 780-492-2109

Background: I am interested in understanding more about how parents engage with nature in their community and the barriers and opportunities they see there. Photographs are being taken to better understand this. These pictures will be analyzed and used in individual and group discussions with researchers and participants to help talk and learn about engagement with nature. Selected photos will also be used to talk about the study at presentations, at conferences or journals. Your name will not be attached to the pictures. The pictures will not be used for advertising. This research has been reviewed and approved by the Health Research Ethics Board of the University of Alberta and the Guysborough Antigonish Strait Health Authority (GASHA) Research Ethics Board.

CONSENT FORM

Consent:

"I, _____, agree that my photograph or the photograph of my child can be used for the following:

☐ interview and group discussions as part of this study
☐ presentations, publications, scientific journals in relation to this study

Signature of Subject _____

(Printed Name) _____

Date: _____

I believe that the person signing this form understands what is involved in the study and voluntarily agrees to participate.

Signature of Witness _____
(Printed Name) _____

Date: _____

Appendix V: Research Transcriptionist Confidentiality Agreement

I _____(print name) agree that any data (verbal and/or written) transcribed for the study entitled "*Engaging with Nature: A Participatory Study for the Promotion of Health*" will be kept in strict confidence. I will not communicate any participant identifying information or information about the data to anyone outside of the research team of Patti Hansen-Ketchum, Dr. Patricia Marck, Dr. Linda Reutter and Dr. Elizabeth Halpenny.

Signed: _____(Transcriptionist)
Date: _____

Witness: _____(Researcher)
Date: _____