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Communicating the Values of Ecological Integrity:
A Case Study of the Icefields Parkway

by

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Submitted in partial fulfilment of the requirements
for the degree of Master of Environmental Studies

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ABSTRACT

The Parks Canada Agency legislated ecological integrity (EI) as its first management priority, in an “integrated” approach to park management that includes the directives of visitor experience and public education. Planned upgrades to the Icefields Parkway region in Banff and Jasper National Parks aim to showcase this integrated approach. This research explores what it means to provide educational experiences that correspond with current conceptions of EI from the perspective of educational specialists working in this region. A literature review of EI narratives, the fields of interpretation and environmental education addresses linkages between park education and EI management goals. Results obtained from participant observations, key-informant interviews, and focus groups reveal: (1) that educational specialists perceive EI in a complex and pluralistic manner; and, (2) that they see a need for standard interpretation to embrace a pluralistic environmental education approach to increase visitors’ appreciation for, understanding of, and will to protect EI.

LIST OF ABBREVIATIONS USED

EI	Ecological Integrity
MPHIA	Mountain Parks Interpretation Association
NAAEE	North American Association for Environmental Education
PCA	Parks Canada Agency
UNESCO	United Nations Educational, Scientific and Cultural Organization

GLOSSARY

The four ecological integrity discourse definitions presented here have been adapted from a piece written by Clark, Fluker & Risby (2008: 154-155).

1. Wilderness normative discourse

This discourse views ecological integrity as reflecting a pristine, whole and undiminished state that does not generally include humans. The principle of integrity is independent of personal wishes and cannot be subjected to negotiation. Ecological integrity is an empirically measurable objective, and the roles of science and (top-down) managerial implementation are reinforced.

2. Systemic normative discourse

This discourse is based on an understanding of ecosystems as dynamic complex systems whose integrity is a reflection of their resilience in the face of change. Humans are still seen to stress ecosystems, but it is acknowledged that all ecosystems are, to some degree, influenced by human activities. Ecological integrity is an empirically measurable objective, and the roles of science and (top-down) managerial implementation are reinforced.

3. Ecosystemic pluralistic discourse

This discourse builds on the systemic-normative understanding of complex social-ecological systems, but incorporates the consideration of diverse social and values perspectives. This discourse advocates a participatory and transparent decision-making process (as opposed to top-down decision-making processes), and transcends the human-nature dualism evident in the previous two discourses. The role of science is interdisciplinary and collaborative (rather than predictive and directive). *Environmental issues stem from issues of conflicting values.*

4. Transpersonal Collaborative

This discourse rejects the solitary definition of the 'self' in favour of an ideology that recognizes the interdependence of individuals with surrounding social and ecological systems. Ecological integrity is less of a management tool used to solve problems between conflicting management goals (i.e., economic development versus environmental protection), or human value judgments, and more an ongoing, internalized exercise within individuals as they create meaning.

Normative discourse

In this thesis, a normative discourse refers to the set of assumptions present in both the wilderness-normative and systemic-normative discourses that ecological integrity is an empirically measurable objective. A normative discourse also reinforces the role of science and top-down implementation ecosystem management.

Pluralistic discourse

In this thesis, a pluralistic discourse refers to the acceptance of more subjective and value-based interpretations of ecological integrity evident in the ecosystemic-pluralistic discourse and the transpersonal collaborative discourse. A pluralistic discourse emphasizes transparency and collaborative decision-making. Additionally, a pluralistic discourse more explicitly recognizes that humans are part of ecosystems, and focuses on these relationships on biophysical and personal (mental, emotional, and spiritual) levels.

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CHAPTER 1 INTRODUCTION

1.1 Problem definition and background

A new paradigm in protected areas management is emerging in Canada and beyond (Phillips 2004; Sheppard 2006; Rettie 2006; Mose & Weixlbaumer 2006). The need to transition away from park management models that traditionally worked against people, in favour of models that have begun working *with* people has been advocated (Phillips 2004; Sheppard 2006; Clark, Fluker & Risby 2008). Supporters of this new park management paradigm have recognized that “nature can only be protected and advanced by man in a sustainable way if mankind considers itself to be a part of nature” (Mose & Weixlbaumer 2006:152). This marks a significant shift in the way protected areas are traditionally perceived and managed. In Canada’s national parks, early signs of this paradigm shift away from overly “simplistic”, “rigid”, and “hierarchical” management regimes are evident (Clarke et al. 2008: 163-164). In the wake of the recent corporate orientation documents, Parks Canada Agency executives are readying themselves “for an important shift, one that recognizes that ecological integrity cannot be achieved without people” (Rettie 2006b: 374).

While managing for ecological integrity has been legislated as Parks Canada’s primary objective (PCA 2000a), a simultaneous effort to provide visitors with quality experiences and opportunities to learn while in the park has been equally supported by the Agency’s new “integrated mandate” (PCA 2007b). The basic assumption is that with experience in, and education about the natural environment, a greater appreciation and understanding of ecological integrity will follow (PCA 2007b, Latourelle 2006). The Icefields Parkway, a popular stretch of highway housed by the Mountain National Parks has been identified by the Agency as the next major focus area in which “a truly integrated approach to park management” (Rettie 2006a) should unfold (PCA 2007c).

Apart from the basic assumption that with education and experience comes an appreciation of and will to protect ecological integrity, just how the concept of ecological integrity ought to be incorporated into these supporting activities has not yet been defined or explored. Using the Icefields Parkway as a case study, this research focuses on how

the concept of ecological integrity could be integrated into educational park experiences based on the thoughts and opinions of senior educators, interpreters and park communicators. It compares the definition and characteristics of Parks Canada's ecological integrity mandate to a variety of other ecological integrity discourses that have emerged over the years. The findings raise issues for all of the Mountain National Parks, and may provide broader insights to protected areas education for ecological integrity in general.

1.1.1 An integrated mandate

Management decisions in Canada's National Parks take direction from what has recently been termed an integrated mandate. This mandate is comprised of three areas of focus: managing for ecological integrity, ensuring high quality visitor experience, and providing opportunities for visitors to learn (PCA 2000a). Collectively, and theoretically, these components are meant to work towards the common goal of maintaining and advancing the natural and cultural history of Canada's national parks – helping visitors to *enjoy, understand and appreciate* the significance of these special places. In light of the management paradigm associated with this current “protection *through* use” mandate, this approach is to be a significant step away from the traditional dual mandate of “protection *versus* use,” in favour of an approach that more explicitly embraces the idea of humans being a part of nature (Gertsch & Jager 2006; Rettie 2006b). It is the relationship between the three components of Parks Canada's current mandate that are of interest in this study.

1.1.2 Ecological integrity

Ecological integrity is greatly threatened worldwide in all ecosystem types and scales (Brown, Manno, Westra, Pimental & Crabbe 2000). Continued stress placed on natural environmental systems caused by an almost worldwide culture of consumption has the potential to trigger an irreversible collapse of global ecosystems (IUCN 1996 & 2000; Brown et al. 2000; Dearden & Rollins 2002; Orr 2004). As the level of impairment

in the global ecosphere has increased, the protection of ecological integrity has become a primary focus of many conservation agendas extending into the realms of ethics, policy, science, resource management, and sustainable development. Ecological integrity has become an integral concept in the science, planning and management of protected areas around the world, including in the Parks Canada Agency (PCA 2001). As of 2002, the Parks Canada Agency was the largest and most influential organization to adopt ecological integrity as its guiding principle (Dearden & Rollins 2002).

Ecological integrity is a highly debated concept, reflecting varied scientific worldviews with respect to how people see themselves in relation to nature (Clark et al. 2008). Numerous definitions exist (Karr 1991; Kay 1991; Woodley, Kay, Francis 1993; Westra 1994; PCA 2000b), and despite a healthy debate over the adequacy of ecological integrity as a policy goal (e.g. Wicklum & Davies 1995), there is little discussion about what the plurality of definitions means for practice (Manuel-Navarrete 2003, Clark et al. 2008). It is “generally accepted that ecological integrity displays little human influence and contains all elements of a natural-evolved system appropriate to the local environmental conditions” (Turner & Beazley 2004: 44). The literature demonstrates that the ways in which this term is conceived and operationalized can differ significantly between applied fields, and even amongst peers (Norton, 1998; Hull et al., 2003). The unfortunate result has been increased ambiguity around the concept, leading to a variety of management challenges (*ibid.*)

Recently, interpretations of ecological integrity and ways of managing for it have emerged that appear more consistent with a paradigm shift towards recognizing the place of people *in* nature as opposed to just their impact *on* nature. In spite of forewarning that a paradigm shift in park management is underway, few authors have questioned whether original conceptions of ecological integrity in Parks Canada have also shifted.

1.1.3 Park education and interpretation for the appreciation and protection of the natural environment

With a potential paradigm shift in park management, it is timely to look at current approaches to and suggestions for educational experiences that honour the changing

values of ecological integrity. Based on the literature, it appears that standard forms of interpretation exemplify characteristics of earlier park management paradigms imbued with traditional tensions between ‘use versus preservation,’ and a reliance on ‘objective,’ technical-scientific models of solving environmental problems (McCool & Stankey 2003). Additional literature suggests that the characteristics of environmental education appear to align better with the shifting focus of park management paradigms (i.e., Negra & Manning 1997, Sheedy 2006).

Visitor experience “is the cumulative outcome of the individual’s visit and their interactions with Parks Canada, and its partners” (Sheedy 2006:167). According to Parks Canada, managing for quality visitor experiences includes pre and onsite trip planning, reception and orientation services, the maintenance of campgrounds, and visitor safety programs. Most importantly, visitor experience also includes learning opportunities such as interpretation programming, the design of hiking trails, and communication of pertinent park information. This research assumes a significant overlap in park education, interpretation and visitor experience objectives.

1.1.4 Study area: the Icefields Parkway

The Icefields Parkway, located in Banff and Jasper national parks of Alberta, is home to some of the most magnificent alpine views and glacial deposits in North America. The majesty of snow-capped mountains, turquoise lakes and massive glaciers, easily accessible via a major highway cutting across the landscape, has made the parkway one of the most prized tourist destinations in Canada. A diverse number of stakeholders, including various independent tour companies, guides, and interpreters, share the Parks Canada Agency’s role of greeting visitors and telling the stories of this place.

Over 1.6 million visitors come to the Icefields Parkway each year (PCA 2003). However, the Icefields Parkway has received little focused attention from the Parks Canada Agency in the last twenty to thirty years, and the area’s road surface, pull offs, trails and interpretive media are worn down and in many cases out of date. Parks Canada has recently announced plans for reinvestment (PCA 2009a). According to one member of the Icefields Parkway Planning team, “[i]deally, this reinvestment will incorporate an integrated

mandate for ecological integrity, visitor experience and public information and education. ... The Agency would like to see the Icefields Parkway project as a showcase for this new mandate ...” (Rettie 2006a).

Significantly, although the intention behind reinvesting in the visitor experience and educational side of the Icefields Parkway is meant to work alongside the parks’ ecological integrity objectives, no parameters exist for what it means to provide educational experiences for the appreciation and protection of ecological integrity. Furthermore, the concept of ecological integrity as currently conceived and publicly interpreted by individuals responsible for park education and interpretation in the area has not been documented.

1.2 Project overview and objectives

The majority of current research associated with managing protected areas for ecological integrity has taken place within the natural sciences. While numerous ecologists have (and continue) to explore appropriate ecological indicators for measuring and managing the integrity of natural systems, surprisingly little research has gone into evaluating the social construction and implications of these scientific frameworks as well as examining how they unfold on the ground (for notable exceptions see Manuel-Navarrete 2003; Turner & Beazley 2004; Clark et al. 2008). While this research utilizes a case-study approach of the Icefields Parkway region, many of the nationally prescribed management objectives and associated activities are consistent throughout Canada’s national parks and protected areas.

Educational opportunities along the Icefields Parkway come in many forms and are provided by a combination of private enterprises, community groups, concerned individuals, and Parks Canada. This research targets a diversity of actors united by a common interest in educational experiences for the appreciation and protection of the natural environment. Study findings tease out dominant themes illustrating how ecological integrity is personally conceived and translated into the realm of protected areas education from the perspective of study participants.

The study has two broad goals. The first is to examine the personal meaning behind Parks Canada's definition of ecological integrity and the social significance that this definition has for places like the Icefields Parkway and protected areas more generally. The second goal is more practical and aims to assess how the principles of ecological integrity are translated into a vision for park education. This case study is designed to assess the following set of research questions:

- What personal meaning does ecological integrity have to senior interpreters, educators and park communicators?
- What definitions of ecological integrity are senior interpreters, educators and park communicators using, or would like to use, in their work?
- How does this compare to the Parks Canada Agency's operational definition of ecological integrity?
- In accordance with their personal definitions of ecological integrity, what do senior interpreters, educators and park communicators think the learning goals of park interpretation and education should be?
- What recommendations do senior interpreters, educators and park communicators have for the Parks Canada Agency to make interpretation and education a valuable asset in the 21st century?

1.3 Research approach and methods

In contrast to the majority of research surrounding issues of ecological integrity, this study applies a qualitative approach. To date, it could be said that most "ecological stressors" of concern to ecosystem biologists have been linked to human activity within the environment, and thus carry with them a distinctly social element. Although there is much social research pertaining to visitor use and experience in parks, there is comparatively little literature that explicitly addresses the way that ecological integrity principles have and/or should shape visitor experience directives.

1.4 Structure of thesis

In the following chapter (Chapter 2), relevant literature is reviewed in the areas of ecological integrity, environmental education and interpretation. The place of ecological integrity in the Parks Canada Agency's mandate, and the mandate itself is discussed.

Chapter 3 describes the research methods employed in this case study. Limitations of the study design and a personal research statement are also found in this chapter. In Chapter 4, the findings of participant observations, and a series of interviews, and focus groups are presented. Major themes are identified that highlight changing ideas about ecological integrity and present suggestions for the ways in which these values might be incorporated into an educational framework for the appreciation and protection of ecological integrity. Finally, in the thesis discussion (Chapter 5), the study findings and pertinent issues from the literature review are synthesized and implications are discussed.

CHAPTER 2 LITERATURE REVIEW

This review is presented in three major sections that summarize and draw out conceptual connections between four distinct bodies of literature addressing: ecological integrity, interpretation, environmental education, and Parks Canada Agency planning documents. This chapter begins by exploring the concept of ecological integrity. A review of the literature reveals that numerous definitions of ecological integrity exist, presupposing varying ways of understanding the natural environment and the human connection to and role in nature. Four types of ecological integrity discourses are identified, discussed, and finally, compared to the assumptions imbued in the Parks Canada Agency's working definition of ecological integrity.

Second, this chapter explores concepts of interpretation as an educational process for the protection of the natural environment. The most popular definitions and generally accepted objectives of interpretation are provided, as well as the history of interpretation in national parks. The value and role of interpretation as a park management tool for ecological integrity is described. Finally, the interpretive objectives of the study area are identified and examined.

The third section of this chapter reviews key concepts in the field of environmental education. The history, definition, goals and objectives of environmental education are discussed. A comparison is made between the goals of environmental education and interpretation and their guiding worldviews.

2.1 Exploring the concept of ecological integrity

The aim of ecological integrity has become one of the most predominant conservation norms of today. Dating back as early as 1949, Aldo Leopold - who spoke widely about the need for a renewed land ethic - used the term "integrity" in a biological sense when he stated: "A thing is right when it tends to preserve the integrity, stability and beauty of the biotic community. It is wrong when it tends otherwise" (Leopold 1949, 99). Since Leopold's time, numerous efforts have been made to define ecological integrity. In a most applications "the term ecological integrity relates to the

‘natural’ condition of an ecosystem, denoting ecosystems that are the ‘most natural’ as those with the greatest integrity” (Turner & Beazley 2004: 47).

“Natural,” a term which has been criticized as vague (Turner & Beazley), has given way to a breadth of conservation-based concepts – many of which are now subsumed under the umbrella concept of ecological integrity (Noss 1990; Turner & Beazley 2004). As such, ecological integrity has been described as the most comprehensive conservation normative today (Callicott, Crowder, & Mumford 1999). Concepts whose principles are conceptualized in conjunction with ecosystem integrity include high levels of ecosystem health, biodiversity, native species, stability, resistance, resilience, sustainability, naturalness, and wilderness/wildness (Noss 1995; Woodley 1996; Westra 1998; Nielsen 1999; Rapport, Costanza & McMichael 2009; Turner & Beazley 2004). Embedded within the discourse of ecological integrity are numerous debates that call into question the age-old philosophical dilemma associated with questions of naturalness: “What is the place of humans in nature?” (Callicott et al. 1999: 23).

Within conservation philosophy, two major schools of thought have emerged: compositionism and functionalism. Each of these worldviews has greatly influenced the development of concepts of ecological integrity. For compositionists, nature is understood through evolutionary ecology and people are viewed as “a case separate from nature” (Callicott et al. 1998: 24). In contrast, functionalists conceive of nature through ecosystem ecology and consider people to be a part of nature (*ibid*). Analysis of a broad range of ecological integrity definitions reveals a number of perspectives that fall along a conceptual spectrum: from a compositionist worldview to a functionalist one.

Originally, the concept of ecological integrity grew out of compositionist thought since the founding principles of ecological integrity lie in evolutionary biology, an essentially entity-oriented approach to ecology (Callicott et al. 1998: 24). In this light, compositionists have tended to see people as a case separate from nature (and natural places with integrity) “because culture uniquely enables *Homo sapiens* to adapt to various environmental conditions many orders of magnitude faster than other species” (24). On the extreme end of this spectrum, ecological integrity discourses have adopted the view that most human modification of nature is unnatural. In their review of the literature prior

to 2004, Turner & Beazley found that it was "...generally accepted that ecosystem integrity displays little human influence and contains all elements of a naturally-evolved system appropriate to the local environmental conditions" (2004: 45). The following are some examples of ecological integrity conceptual interpretations influenced by a compositionalist worldview.

Biological integrity ... refers to the capacity to support and maintain a balanced, integrated, adaptive biological system having the full range of elements (genes, species, assemblages) and processes (mutation, demography, biotic interactions, nutrient and energy dynamics and metapopulation processes) expected in the natural habitat of a region. ... An evolutionary foundation ties the concept of integrity to a benchmark against which society can evaluate sites altered by human actions (Karr 1996: 101).

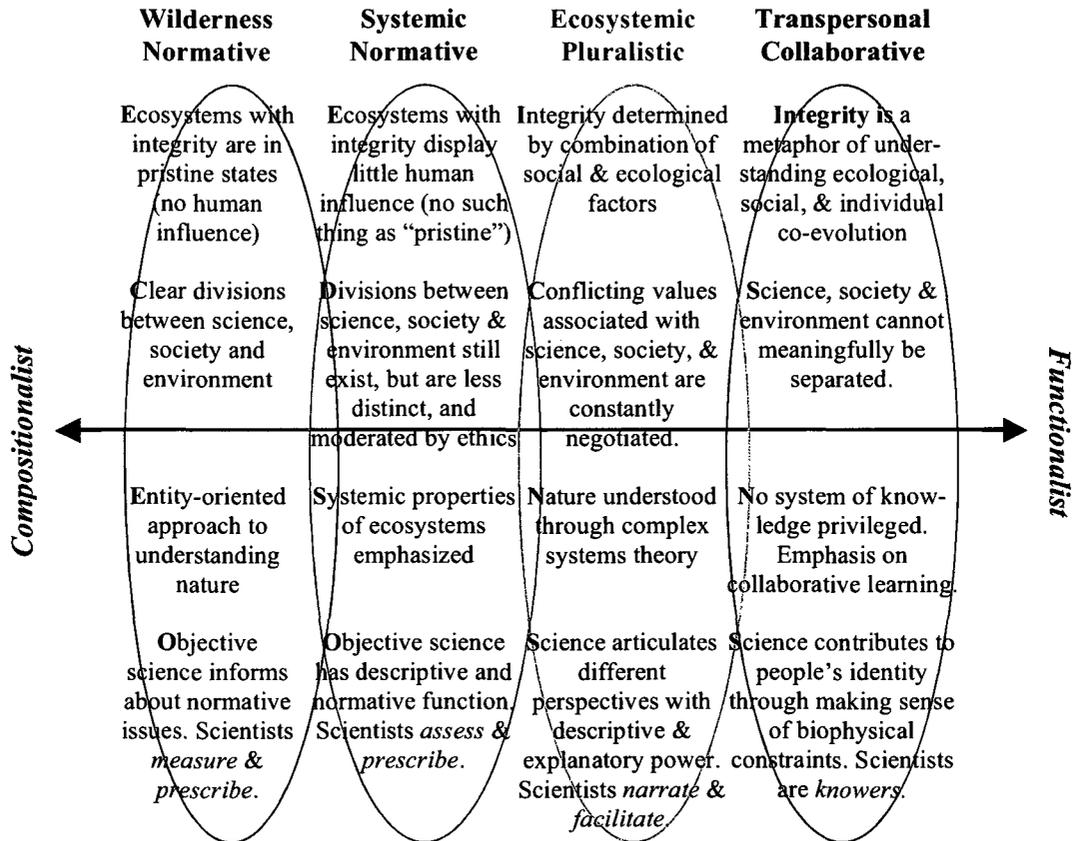
[Ecological integrity is] the state of being whole, entire or undiminished, a sound unimpaired or perfect condition (Miller & Rees 2000: 10).

Not all definitions of ecological integrity satisfy the elements of compositionalist perspectives. More recent conceptions have questioned the separation of people from nature, as well as challenged the utility of a strictly entity-oriented approach of nature understanding (Kay & Regier 2000; Manuel-Navarrete et. al. 2001; Turner and Beazley 2004). Some of these conceptualizations (i.e., Kay & Regier 2000) are more closely aligned with a functionalist worldview that typically sees things through "the lens of ecosystem ecology, an essentially process-oriented, thermodynamical approach to ecology" (Callicott et al. 1999: 23). For functionalists, *Homo sapiens* are viewed as no less natural than any other species, and can therefore interact with nature in a way that is not necessarily destructive (*ibid*). This discourse maintains that people *can*, but not necessarily always *do*, act in ways that degrade natural systems.

A more detailed investigation into interpretations of ecological integrity reveals four ecological integrity discourses, which appear to fall along the compositionalist to functionalist spectrum: wilderness-normative, systemic-normative, ecosystemic-pluralistic, and transpersonal-collaborative. The following sections are modeled after a framework presented by Manuel-Navarrete et al. (2001), who conceptualized ecological

integrity into these four discourses. It has recently been adapted by Clark et al. (2008). Figure 1 provides a summary diagram of these ecological integrity discourses.

Figure 1. Conceptual diagram of ecological integrity discourses



2.1.1 Wilderness-normative

A wilderness normative view of ecological integrity is associated with a strict compositionalist classification as it assumes that “ecological integrity does not include human beings” (Manuel-Navarrete, et al. 2004: 216). This discourse focuses on ecosystem components and suggests that an ecosystem has integrity when it includes the full complement of native biodiversity and ecological processes within their natural ranges of variability. Proponents of this worldview maintain that “humans are destined to

destroy nature” (Clark et al. 2008: 154), therefore degradation or loss of integrity may be attributed to any human-induced divergence from baseline conditions (Miller & Ehnes 2000; Manuel-Navarrete *et al.* 2004; Clark et al. 2008).

According to wilderness-normative proponents, ecosystems with integrity are the product of a long history of evolution, unaffected by human activities, thus rendering an ecosystem state that has all of its biological elements and processes intact and operating at natural levels (Karr & Chu 1999). The wilderness-normative model follows a long tradition of looking at nature through a scientific lens of simplicity, linearity and predictability (Miller & Ehnes 2000). From this point of view, clear divisions exist between science, society and the environment. Based on quantitative measurements, ecological integrity is managed by experts (scientists) seeking to prescribe a balance between human areas and pristine areas (e.g., unaffected by humans). Within this discourse, the main objective of ecological integrity management is to be effective in current political and social contexts so as to preserve pristine areas with integrity. The worldview supporting these procedures is distinctly modernist and positivist since “empirical observations through quantitative indicators appear as the only means to... objective reality” (Manuel-Navarrete et al. 2004: 217).

Within this discourse, the greatest challenge associated with ecological integrity research lies in the identification of objective ecological indicators. “Given the lack of precise ecological models that predict the consequences of human activities, the priorities are to: (1) discover the relevant properties of ecosystems associated with the loss of integrity, (2) design appropriate indicators, and (3) identify levels of those indicators that can define integrity or lack thereof” (Manuel-Navarrete et al. 2004: 217). From this vantage point, the scientists’ roles are primarily to measure and prescribe solutions to ensure the ethical prerogative of ensuring absolute autonomy for nature (Manuel-Navarrete et al. 2004).

More recently, the human dimension of the wilderness-normative discourse has been expanded to accommodate for issues such as human population growth, equity, and mass consumption in Western societies (Manuel-Navarrete et al. 2004: 217). New indicators that take these human dimensions into account (such as the ecological footprint) have been developed with the belief that a combination of ecological, social,

and economic indicators would result in a more effective way of assessing and managing for ecological integrity (Grumbine 1997; Manuel-Navarrete et al. 2004). This discourse favours “top-down” policies, indicators and management techniques to effectively reach the goal of “keeping people out of ecosystems” (Manuel-Navarrete et al. 2004: 217).

2.1.2 Systemic-normative

A second perspective on ecological integrity is described as the systemic normative worldview. This perspective “still holds that integrity is an empirically measurable objective that represents the wellness of ecological systems apart from human influence, as well as reinforces the roles of science and managerial implementation” (Clark et al. 2008: 155). Within this worldview, humans are still seen as threatening to natural systems. However, it is accepted that all ecosystems are, to some degree, influenced by human activities (Manuel-Navarrete et al. 2004). Consequently, this discourse downplays the idea of “pristine ecosystems” (Manuel-Navarrete et al. 2004; Clark et al. 2008), presenting itself as more pragmatic than wilderness-normative comprehensions of nature. While it is not necessary for an ecosystem to be absolutely free of human influence to have integrity, ecosystems with their “original integrity” intact are believed to have more integrity than non-pristine ecosystems (Westra 1994, Ulanowicz 2000).

This perspective emphasizes the systemic properties of an ecosystem (as opposed to simply ecosystem components). It focuses on vigour, organization and resilience of complex ecosystems in the face of change (Ulanowicz 2000). In comparison to the wilderness-normative, “[e]cosystems are understood to be dynamic, instead of static, entities” (Manuel-Navarrete et al. 2004). Embracing the inherent uncertainties associated with ecological integrity presents the largest challenge for scientists and managers within this discourse (*ibid*). Ecological integrity focuses on “how much the ecosystem can deviate from a ‘good’ direction without arriving at an irreversible change” (Manuel-Navarrete et al. 2004:218). From this perspective, ecological integrity is most commonly “assessed by looking at: (1) health, which applies to ecosystems that function successfully despite human impacts, (2) ability to regenerate themselves, withstand

stress, and (3) ability to continue their ongoing development” (*ibid*). From this vantage point, the primary role of scientists has changed from measuring and prescribing, to *assessing* and prescribing solutions towards maintaining the ethical prerogative of protecting nature’s autonomy in terms of self-organization processes (Manuel-Navarrete et al. 2004).

The science in this discourse is still predominately modernist in orientation, but is more structuralist than positivist (Manuel-Navarrete et al. 2004). The divisions between science (experts), society and the environment are moderated by ethics. Environmental issues are framed as a failure of management to minimize the threat of human systems to natural systems. Much of the literature on adaptive management and ecosystem-based management incorporate the main principles of this worldview (Manuel-Navarrete et al. 2004; Clark *et al.* 2008). This discourse has been broadly adopted throughout North America (*ibid*).

2.1.3 Ecosystemic-pluralistic

More recently, several authors have focused on the socio-cultural foundations of the ecological integrity concept, giving birth to a third worldview: ecosystemic pluralistic. This differs from the previous discourses in three ways: (1) ecological integrity is understood through a lens of complex systems theory as a fundamentally different perspective for knowing the world (i.e., through ecological understanding); (2) the incorporation of social values into the definition of ecological integrity; and (3) a new definition of the role of science (i.e., from discovering universal laws to negotiating conflicting values) (Manuel-Navarrete et al. 2004).

A system with integrity may be defined as an umbrella concept with which to discuss the ability of ecosystems to continue self-organization (Manuel-Navarrete 2004, Turner & Beazley 2004). Managing for ecological integrity from an ecosystemic-pluralistic point of view is predicated on managing for preferred states of ecosystems as opposed to managing for the preservation of pristine ecosystems. Ecological integrity is rooted in certain ecological concepts combined with certain sets of human values (Miller

& Ehnes 2000). There is not necessarily a unique, ecologically *correct* ecosystem to be preserved or maintained based on scientific knowledge (Manuel-Navarrete 2004).

This discourse presumes that “scientific knowledge is always obscured by irreducible uncertainties” (*ibid*), thus “‘facts’ are always the product of selective perceptions, values, and interests” (*ibid*). Science helps to provide information on the rules governing ecosystem evolution, but provides only possibilities, not necessities (Kay 1993). Rather than the role of scientists being to measure/assess and prescribe, as in the normative discourses, the roles of narrator and facilitator are preferred. Managing for ecological integrity within this discourse involves the navigation of goals and objectives situated explicitly within broader social contexts, as opposed to aiming for a strictly objective scientific approach.

Like the previous discourse, the ecosystemic-pluralistic model is still modernist and structuralist in orientation. It privileges science’s knowledge about nature and still assumes a mind-nature divide (Manuel-Navarrete et. al. 2004). However, it acknowledges that scientific knowledge of nature cannot escape the limitations placed by uncertainty and complexity inherent in natural systems. “[H]uman activities are understood to be the result of complex, self-organizing dynamics that interact, unavoidably, with ecological dynamics” (Manuel-Navarrete et al. 2004:220). This discourse proposes to change the decision-making process evident in the previous perspectives from being expert-based, to include participatory elements and be more transparent about decision-making (Clark et al. 2008). While scientific knowledge about nature is still privileged, the role that scientists play is more collaborative “rather than predictive and directive” (Clark et al. 2008: 155). Much of the literature on adaptive management, and community-based management reflect the principles of the ecosystem-pluralistic perspective with a focus on navigating complex social-ecological systems (Grumbine 1997; Clark et al., 2000).

Ecosystem-based management and the ecosystemic-pluralistic discourse add to the rationale for community participation in ecosystemic management, as well as the need to face uncertainty and the value-laden nature of any description of a complex ecological system (Kay & Regier 2000, Manuel-Navarrete 2004). This discourse recognizes that humans influence, and are influenced by, nature. It blurs the human-nature dualism further, rendering the role of science as more interdisciplinary and

collaborative, as opposed to predictive or directive (Clark *et al.*, 2000, Manuel-Navarrete 2001). From this perspective, “[e]cological integrity can help to inform a participatory process for those decisions involving ecological issues” (Manuel-Navarrete *et al.* 2004:219). Collaborative management deals with nature through a focus on human-ecosystem trade-offs (Manuel-Navarrete *et al.* 2004).

This perspective has maintained that “environmental issues tend to be problems stemming from conflict” (Clark *et al.* 2000:155), since it is the plurality of values which lead to discrepancies over how to manage ecological integrity. All the discourses presented thus far share the assumption that ecological integrity is an issue to be managed hierarchically through policy (Manuel-Navarrete *et al.* 2004).

2.1.4 Transpersonal collaborative

A fourth discourse seeks to transcend the condition of separateness in recognition of the interrelated unity of all life (Manuel-Navarrete *et al.* 2004; Naess 1973). This discourse departs from the dominant Western liberal ideology visible in the above conceptions, whereby the notion of conflict between individuals is the root cause of environmental problems. This discourse, called the “*transpersonal collaborative*,” rejects the Western liberal notion of “‘self’ ... in favour of an ideology that recognizes interdependence of individuals with surrounding social and ecological systems” (Clark *et al.* 2000:155). Ecological integrity is no longer a management tool used to solve problems arising from conflicting values. Rather, it is viewed as an internalized exercise within individuals as they create meaning within place (Clark *et al.*, 2000).

The ecological integrity concept serves more as a metaphor for understanding ecological, social and individual co-evolution (Manuel-Navarrete *et al.* 2004). “In practice, this implies that any individual’s biophysical living conditions (e.g. the amount of water an individual can consume) are seen as constrained by biophysical aspects of both social organization (e.g., artificial structures for water distribution), and ecological organization (e.g., natural water reserves)” (Manuel-Navarrete *et al.* 2004:221).

Within a scientific knowledge-production system, describing the biophysical elements of any system still comprises a relevant and valuable contribution to this

discourse (Clark et al. 2000). However, in light of the limitations inherent within modern science and complex systems theory, this discourse quickly turns its focus to the non-material aspects relevant to personal relationships and development. Ecological integrity from this point of view “has to do with understanding how our values and worldviews affect our way of interacting with ecosystems and how this interaction, in turn, affects our own personal well being. It is not a matter of having better information for making better decisions, but of creating meaning about the relational matrix within which individuals, social systems and ecosystems co-evolve” (Manuel-Navarrete et al. 2004:221).

In this discourse, ecological integrity is understood within the context of a larger environmental crisis. Dealing with this crisis demands a deep change in the way we understand ourselves as humans and how we interact and conceive our place with nature (Manuel-Navarrete et al. 2004). “Transpersonal” signifies a departure from an emphasis on individuality towards an attitude of “respect for others as a central way of being” (*ibid*). The logic here is that caring for nature flows naturally when the sense of self is widened and deepened so that nature is felt and conceived as being a part of the self (Josselson, R. 2000, Manuel-Navarrete et al. 2004). However, critics of this approach argue that it is logically inconsistent, as well as morally naïve, to suggest that care for others is the same as or should derive from an extension of self (Sessions 1991). Rather, one should love and respect the other for its own self and its differences from you, not simply because you perceive of it as part of yourself.

The priorities when dealing with issues of ecological integrity from a transpersonal-collaborative viewpoint are: (1) making choices in an informed and transparent manner, (2) promoting constructive dialogue among different perspectives, and (3) avoiding the treatment of nature as only abstracted objectified data by fostering individuals’ positive feelings of identification with an ever-expanding sense of self (Manuel-Navarrete et al. 2004). With regards to ethics, navigating conflicting values is not the focus. Rather, the role of ethics is to foster “collaborative learning about ecological integrity as an evolutionary path in our being-towards-death” (Manuel-Navarrete et al. 2004:222). Within this discourse, making meaning of ecological integrity is less an acquisition of knowledge, and more of a living experience that touches both heart and mind (Varela, Thompson & Rosch 1991).

A transpersonal-collaborative notion of ecological integrity is largely consistent with First Nations' worldviews and ways of conceptualizing nature (Berkes 1999; Manuel-Navarrete et al. 2004). However, an in-depth exploration of First Nations' views of ecological integrity is not discussed explicitly within this literature review for a number of reasons: (1) an exploration of this type warrants a thesis in and of itself; (2) to summarize the main tenants a First Nations' view on ecological integrity risks a narrow categorization and over simplifying these issues; (3) much of the inquiry and associated dialogue gathered for this study has been generated within the confines of a dominantly Western Park model; and (4) even though the Parks Canada Agency have advocated for stronger ties with Aboriginal peoples (PCA 2000), there has been very little First Nations involvement, interpretation, or obvious presence within the case study area for this research. That said, research that addresses First Nations views on ecological integrity, and their experiences within the context of the Parks Canada Agency, would make an invaluable contribution to existing Transpersonal-Collaborative literature.

2.1.5 Choosing a discourse

The worldviews presented highlight the tacit and unexamined perspectives behind each discourse that influence social practices and determine how ecological integrity is understood and examined within certain contexts. It is not that one discourse is necessarily better than another. Rather, a particular discourse may be better suited for specific situations (i.e., diverse cultural and ecological contexts, various social institutions, or individual engagement).

Generally speaking, normative discourses have been identified as being better suited for bureaucratic settings characteristic of hierarchical culture where individuals engage in professional practices and science is used to provide specific answers to form the basis of rules and regulations (Holling & Meffe 1996; Hermer 2002; Manuel-Navarrete et al. 2004). On the extreme other end of the spectrum, the transpersonal-collaborative discourse fits better with community initiatives based more on mutual understanding and the need for personal involvement and action (*ibid*). Finally, the ecosystemic-pluralistic discourse is best suited for stakeholder negotiations where there is

a need to translate abstract scientific knowledge so that it can be easily understood, thereby presenting possible options and trade-offs to the parties involved (*ibid*).

The following section provides an overview of the dominant ecological integrity discourse as it has evolved over time within the Parks Canada Agency. This examination is particularly interesting within the context of Parks Canada since ecological integrity discourses are imbedded in institutional policies, informed by ecosystem science, and extended to social situations such as community involvement and public education.

2.2 Ecological integrity and Canada's national parks

With respect to national parks, the chief ecologist for the Parks Canada has contributed volumes to the exploration and application of ecological integrity to protected areas. In 1993, he provided the following statement regarding the concept.

Ecological integrity is defined as a state of ecosystem development that is optimized for its geographic location. For Parks and protected areas this optimal state has been referred to in such terms as natural, naturally evolving, pristine and untouched. It implies that the ecosystem structures and functions are unimpaired by human-caused stressors, that native species are present at viable population levels and, within successional limits, that the system is likely to persist. Ecosystems with integrity do not exhibit trends associated with stressed ecosystems (Woodley 1993:6).

Generally speaking, this definition is in line with a normative discourse whereby pristine ecosystems have integrity. Ecological integrity, as it is currently applied to most protected areas management responds to the dominant Western narrative that views nature as a collection of resources for humans, and people as individuals who exploit those resources (Clark et al. 2008). In this light, the whole *raison d'être* behind protected areas may be seen as a response to the perceived need to legally protect pristine ecosystems from human activities through the policy and the rule of law. For Parks Canada, the protection of ecological integrity has been the legally stated management priority since 1964, and each subsequent amendment to the National Parks Act (1979, 1988 and 1995, 2000) has placed greater legal emphasis on the concept (Dearden & Dempsey 2004). This being said, the Canadian National Parks Act provisions on

ecological integrity are situated within the context of what was previously coined “the dual mandate” of “use” and “preservation.” Section 4(1) of the legislation states:

The national parks of Canada are hereby dedicated to the people of Canada for their benefit, education and enjoyment ... and the parks shall be maintained and made use of so as to leave unimpaired for the enjoyment of future generations.

To identify, define and set goals to maintain national parks as “unimpaired”, the Parks Canada Agency currently turns to the notion of ecological integrity. With respect to a national park, ecological integrity has been defined as “a condition that is determined to be characteristic of its natural region and likely to persist, including abiotic components and the composition and abundance of native species and biological communities, rates of changes and supporting processes” (PCA 2001:5). Today, the *Canada National Parks Act* states that “maintenance or restoration of ecological integrity through the protection of natural resources and processes shall be the first priority of the Minister when considering all aspects of the management of parks” (PCA 2000a: Section 8(2)). Generally, the Parks Canada Agency’s definition of ecological integrity exhibits characteristics of a systemic-normative discourse by virtue of its emphasis on empirically measurable determinants of ecological integrity, and the systemic and dynamic properties of ecosystems. Within this framework, the authority of science in determining and managing ecological integrity are maintained, but it is not necessary for ecosystems to be absolutely free of human influence to have various levels of integrity.

The rise in a protection-oriented priority within the national park system may be said to have been significantly influenced by two landmark reports: the 1996 *Banff-Bow Valley Study*, and the subsequent 2000 *Panel on the Ecological Integrity of Canada’s National Parks* (the EI Panel). The Banff-Bow Valley Study reported on the unprecedented commercial development taking place in the area and emphasized that current rates of growth were likely to cause serious and irreversible harm to the ecological integrity of the area (1996, 4). After the Report’s release, the Minister of Heritage at the time announced several restrictions of commercial development and established the EI Panel to “assess the strengths and weaknesses of Parks Canada’s approach to the maintenance of ecological integrity and provide advice and recommend

how best to ensure that ecological integrity is maintained across the system of national parks” (PCA 2000: 1-2). The resulting report was “unequivocally critical of the trend in parks management to overemphasize ‘use’ in parks” (Clark et al. 2008, 157). The EI Panel made a total of 127 recommendations, all with the accompanying underlying message that ecological integrity within Canada’s national parks was in peril and in need of immediate attention.

In the last 15 years, Canada’s national parks have struggled with turbulent times: budgets and staff have undergone drastic reductions, and the Agency has endured repeated reorganizations (Wright & Rollins 2002; Dearden & Dempsey 2004, Clark et al. 2008). As such, implementation of the Panel’s recommendations has been severely constrained (Dearden & Dempsey 2004; PCA 2001b).¹ Furthermore, in the process of Parks Canada’s concentrated search for a simple, defensible, and nationally applicable definition of ecological integrity (PCA 2000), Parks Canada has been criticized for conflating goals and metrics of ecological integrity, which “has produced a linear, deterministic management model that presupposes that a park is a stable ecosystem that has high integrity unless stressed by human activities” (Clark et al. 2008: 157). Parks Canada’s definition of ecological integrity has forced the organization to treat all social-ecological interactions as either stressors *or* management interventions (*ibid*). Thereby, this model has made it difficult to account for nonlinear ecosystem behaviour, multiple stable states, and complexity of both ecological and social relationships impacting ecological integrity (Manuel-Navarrete et al. 2004; Clark et al. 2008).

Some elements of a systemic-normative discourse are evidenced further in Parks Canada’s model of ecological integrity through the Agency’s top-down and rigid style of management (Fluker 2003; Clark et al. 2008). Furthermore, an underlying narrative of conflict between human activities and the wellbeing of ecosystems in parks is evident in the ongoing conflicts between economic development and environmental preservation. These human-nature conflicts are often shaped and presented in the overly simplistic and divisive worldviews upheld in the systemic-normative discourse and thereby limit the viability and potential of management decisions (*ibid*).

¹ One exception includes funding secured in 2004 that was allotted to individual projects such as the Bow Valley Eco-integrity Project (Morrow, A. 2006)

Although the legislative framework defining ecological integrity in the park system demonstrates characteristics of a normative discourse, on-the-ground decisions made in parks do not always reflect this worldview (Fluker 2003; Clark et al. 2008). Regardless, the ways in which the concept of ecological integrity have filtered down, and have been represented, in the realm of education and communications activities warrant exploration. The place of education and visitor experience in Park management is addressed in the following section.

2.3 The Parks Canada Agency mandate

Accompanying Park's Canada's mandate to manage for the protection and enhancement of ecological integrity are two additional management objectives focused on the delivery of park education and an emphasis on positive visitor experiences. Collectively, these objectives form the Parks Canada Agency's current "integrated mandate," which has been presented as an advance from the preceding conflicting mandate of "use" and "protect" (Latourelle 2006). This mandate and self-identified role, according to the *Parks Canada Agency Charter*, are presented in Box 1.

Box 1: Parks Canada Agency mandate and role

Our Mandate:

On behalf of the people of Canada, we protect and present nationally significant examples of Canada's natural and cultural heritage, and foster public understanding, appreciation and enjoyment in ways that ensure their ecological and commemorative integrity for present and future generations.

Our Role:

We are guardians of the national parks, the national historic sites and the national marine conservation areas of Canada.

We are guides to visitors from around the world, opening doors to places of discovery and learning, reflection and recreation.

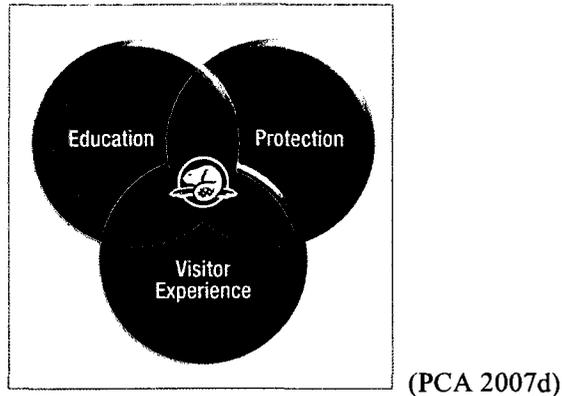
We are partners, building on the rich traditions of our Aboriginal people, the strength of our diverse cultures and our commitments to the international community.

We are storytellers, recounting the history of our land and our people – the stories of Canada.

(adapted from PCA 2009b, Parks Canada Charter)

In essence, the Parks Canada Agency (PCA) mandate embodies three key elements: protection, education and enjoyment. According to the *2007-2008 Report on Plans and Priorities*, Parks Canada's activity architecture is delivered through four main program activities: the establishment of heritage places, the conservation of heritage resources (protection), the promotion of public appreciation and understanding (education), and the enhancement of visitor experience (enjoyment) (PCA 2007b). In principle, the relationships between the elements of visitor experience, education and ecological protection are meant to mutually reinforce one another, and ultimately, help to support the primary mandate of protecting ecological integrity in Canada's national parks (see Figure 1).

Figure 2: Parks Canada Agency Integrated Mandate



The rationale behind the integrated model is simple: in order to safeguard Canada’s “national treasures,” these areas must retain relevance to Canadians. Relevance, it is thought, is significantly stronger when Canadians are presented with opportunities to use and enjoy parks (visitor experience) while also learning about their special features (education). In this way, the theory holds that if visitors are presented with opportunities to create their own unique connections with the places they have come to visit, and leave knowing a little bit more about them, they will likely be more compelled to protect the cultural and natural heritage of Canada’s parks in the future (Latourelle 2008).

This integrated mandate has been said to signal a paradigm shift in the way managers are approaching park management – from one of segregation (protection versus use) to one of integration (protection through use) (Rettie 2006; Mose & Weixlbaumer 2006). However, as some authors indicate, despite the current emphasis on an integrated approach to managing for ecological integrity, it remains to be seen whether anything has/or will change[d] in management practices from a normative view of ecological integrity that “devalues the human role with nature” (Clark et al. 2008: 156). Furthermore, as some research has pointed out, the current integrated approach to Parks management can still operate and be shaped by the confines of normative worldviews (*ibid*). Support for an integrated approach to park management from more of an ecosystemic-pluralistic discourse is not hard to come by. Dearden and Dempsey offer one such example.

... [It] should not be forgotten that protected areas are simply a means to an end, to preserve certain values, like intact ecosystems, in the landscape for current and future generations. Ideally, values like ecological integrity would be sustained throughout the landscape without the need for centralized bureaucracies, fenced – off ecosystems and enforcement personnel. Moving towards such a goal means forging new socio-economic relations with the land and creating new institutions and systems outside the industrial models that make protected areas necessary in the first place. Widespread public awareness of the nature and importance of a land ethic both inside and outside protected areas will be fundamental to realize these broad and sweeping changes. One of the main roles of park systems is to build and nourish support for a land ethic. Unfortunately, the educational role of parks is one of the easiest for budget-cutting politicians and bureaucrats to axe (2004: 237).

Support for an integrated approach to park management is grounded in many of the concerns raised by the ecosystemic-pluralistic worldview: asserting the impossibility of managing for ecological integrity within the boundaries of a park solely through scientific means; calling for the recognition of ecological integrity conservation as the preservation of certain social values; and by challenging necessity of top-down management efforts as being the only way of achieving ecological integrity in national parks. From this standpoint, not only will simple measures such as fencing off ecosystems from people fall short, but also this approach fails to recognize what ecosystemic-pluralists see as the inseparability of people from nature. It follows logically that providing experiences and education for visitors, which help them to consider their own ethics in line with the values of ecological integrity, is acutely needed.

There is little research available exploring how individuals working in parks comprehend ecological integrity. In light of the above literature, numerous questions arise. Do educators' perspectives on ecological integrity match those set out by the Parks Canada Agency? From the perspective of educators in the case study area, how has Parks Canada's focus on ecological integrity translated into the realm of education and visitor experience? What is the primary ethical discourse, or discourses, behind efforts to educate individuals about ecological integrity within the Mountain National Parks? In order to adequately explore these questions, consideration is needed of the interpretive and educational climate in Parks Canada. The following section addresses the past and

present interpretive context of Canada's national parks, and the Mountain National Parks more specifically.

2.4 Interpretation

In this section, the foundations of interpretation are presented, various definitions provided, and objectives discussed. The role and history of interpretation within the Parks Canada Agency context, and unique characteristics of the interpretation context within the Mountain National Parks are addressed.

2.4.1 *What is interpretation?*

Interpretation has many and varied definitions. Typically, interpretation is the non-formal education provided in protected areas such as parks, zoos, and historic sites. One of the earliest and most influential definitions came from Tilden who defined interpretation as “an educational activity which aims to reveal meanings and relationships through the use of original objects, by firsthand experience, and by illustrative media, rather than simply to communicate factual information” (1977: 8). Since Tilden first published this definition in 1957, numerous other individuals and organizations have contributed their own definitions and descriptions (Box 2). These definitions share the assumption that interpretation is a means of communicating with visitors to reveal the relationships within the environment and its relevance to visitors in ways that extend beyond simply imparting facts.

Box 2. Selected definitions of interpretation

A “mission-based communication process that forges emotional and intellectual connections between the interests of the audience and meanings inherent in the resource” (National Association for Interpretation 2009).

“Environmental interpretation involves translating the technical language of a natural science or related field into terms and ideas that people who aren’t scientists can readily understand. And it involves doing it in a way that’s entertaining and interesting to these people” (Ham, S. 1992:3).

Any “interpretation process designed to reveal meanings and relationships of cultural and natural heritage to the public, through first-hand involvement with an object, artifact, landscape or site” (Interpretation Canada 2009).

A “means of communicating ideas and feelings which help people understand more about themselves and their environment” (Interpretation Australia Association 2005).

Numerous principles exist for how interpretation should be conducted. The earliest set of principles developed by Tilden (1977), are referred to as the foundational blocks of the interpretation profession (Brochu & Merriman 2002; Cable & Cadden 2006). Tilden’s principles hold that interpretation (1) must relate what is displayed to the experience of the visitor; (2) is revelation rather than information; (3) is a teachable art; (4) provokes rather than instructs; (5) relates to an underlying whole; and (6) that children will need a qualitatively different interpretive approach from adults (Ablett & Dyer 2009).

Interpretation should be pleasurable (Ham 1992). Interpretation is meant to enrich the experience of the visitor, filling them with wonder and curiosity about the environment (Tilden 1977; Butler 1993; Knudson, Cable & Beck 1995). Interpretation is meant to be relevant in that it is meaningful and personal (Ham 1992). Interpretation should strive to make personal connections for people (*ibid*) by appealing to universals such as family, health, quality of life and concepts like freedom, community, courage or beauty (Beck & Cable 2002). In other words, to be meaningful interpretation must connect with something already in a person’s life (Knudson et al. 1995).

Interpretation should be organized and have a theme (Ham 1992). Good interpretation is easy to follow and should be organized around a central point (*ibid*). Furthermore, the interpretive theme should reveal larger truths, contexts and messages behind a given topic (Tilden 1977, Wearing & Neal 1999). According to Tilden, interpretation is not meant to dispel facts only, disassociated from the broader ecological and social context of the environment at hand. Rather, it should reveal “something of the beauty and wonder, the inspiration and spiritual meaning that lie behind what the visitor with his senses perceive” (Tilden 1977: 3).

Considerations in the development of interpretive programs are diverse and literature on the subject abundant (Ham 1992; WTO & UNEP 1992; Butler 1993; Bromley 1994; Knapp & Benton 2004). Interpretation can be both personal and non-personal in nature. “Non-personal services include displays, exhibits, signs, trails and publications. Personal services include direct contact between the interpreter and the public” (Butler & Hvenegaard 2002, 198). While non-personal interpretation is often perceived as being more cost-effective and easier to implement, numerous studies indicate that personal interpretation is more effective in achieving desired outcomes, such as both short and long-term behaviour changes (Wearing & Neal 1999; Littlefair 2003; Knapp & Benton 2004). No matter what the medium, the goal of most contemporary interpretation appears to be same: to enrich the visitors’ experiences while in the park by exposing them to something in which they have interest.

2.4.2 Objectives of interpretation

A review of the literature reveals that the majority of current interpretation objectives are associated with four perceived benefits: recreation, promotion, economic and educational management objectives. Recreational objectives of interpretation include three perceived benefits. Interpretation is firstly associated with adding value to people’s experience and enhancing their enjoyment (Sharpe 1982; Butler 1993; Bright 1994; Knudson et al. 1995; Knapp 1997). Secondly, interpretation is often utilized as a means of providing orientation information, providing essential facts about particular areas, facilities, and programs to help guide people through their visit (Butler 1993). Finally,

interpretation is used to enhance visitor safety by informing people of relevant safety issues (Butler 1993).

Promotional objectives of interpretation help park management agencies and tour operators to enhance their image, and promote certain organizational messages (Sharpe 1982; Butler 1993; Knudson et al. 1995). In addition, interpretation has been used and proven successful in increasing public awareness and participation in park management issues thereby also increasing public support for management policies (Sharpe 1982; Knapp et al. 1997; Wearing & Neal 1999).

An additional objective of interpretation is the attainment of economic benefits. Interpretation is often used to help attract tourists to certain areas, encourage them to stay longer, thereby also bringing tourism dollars, directly and indirectly, to these places (Butler & Hvenegaard 2002; Wearing & Neal 1999). Effective interpretation also provides economic benefits by reducing management costs through the mitigation of depreciative behaviour (*ibid*).

Finally, the most celebrated benefit of current-day interpretation comes from the ability to assist particular management goals through education. Interpretation has been highlighted as a valuable educational management tool because it allows visitors to retain their own freedom of choice (Brown, McCool & Manfredi 1987; Newsome, Moore & Dowling 2002), it is perceived to be cost effective (Bright 1994; Butler 1993), and it also enhances visitor experiences and satisfaction (Cole 1990; Leung & Marion 2000). Educational interpretive objectives include effecting specific onsite behaviour changes of visitors, and secondly, by fostering support for environmental conservation. Interpretation is highly supported as a means by which to accomplish objectives such as increasing visitor knowledge, shifting attitudes, and changing behaviour (Sharpe 1982; Knapp 1997; WTO & UNEP 1992; Wearing & Neal 1999; Butler & Hvenegaard 2002).

Typically, conventional educational interpretation for behaviour change has a localized focus. Behaviour changes sought through interpretation usually target the immediate environment influenced by visitors, as in the example of moving visitors from a fragile or overused area to a more robust one (Brown et. al. 1987; Weiler & Davis 1993). However, it has been noted that increasingly “interpretation is being used [in places like Australia] to foster a broader environmental consciousness that extends to all

aspects of life, not just to behaviour within park boundaries” (Littlefair 2003:27). While not often identified overtly as an objective of contemporary interpretation (especially in Canada), most sources indicate that there is a *desire* that interpretation work to motivate people towards a greater concern for, awareness of, and will to act intelligently to sustain, the natural environment (Butler 1993; Knudson et al. 1995; Wearing & Neal 1999; PCA 2000; MPHIA 2006). Note, however, that this desire is not necessarily interpretation’s central goal.

2.5 Interpretation and education in Canada’s national parks

Contemporary interpretation in Canada’s national parks originates from the early conservation movement that began in the United States in the nineteenth century (Ablett & Dyer 2009). As such, park education and interpretation have always been fundamental aspects of the protected areas concept. “The first appeal for a ‘Nation’s Park’ in 1822 by artist George Catlin, who called for an area to be ‘preserved for its freshness of nature’s beauty,’ included the assumption that the area would have to be understood to be appreciated” (Butler & Hvenegaard 2002: 179). Following the establishment of Yellowstone National Park, James Harkin, the first Director of Canada’s Dominion Parks Branch, and an admirer of John Muir, used Muir’s term “interpretation” in Canada’s first national parks policy documents and annual reports. Interpretation, he said, would help clarify the value of wilderness with regards to the philosophy and purpose of national parks (Hendersen 1994). As early as the 1870’s, John Muir led visitors to Yosemite on interpretive hikes explaining the dynamics of ecology. During this time, he wrote, “I’ll interpret the rocks, learn the language of flood, storm and avalanche. I’ll acquaint myself with the glaciers and wild gardens, and get as near to the world as I can” (as quoted in Butler & Hvenegaard 2002: 180). Muir is commonly attributed with being the first to use the word “interpret” in a park context, and his writings continue to inspire interpreters to this day (Brochu & Merriman 2002; MPHIA 2006).

The Mountain National Parks have led the field of heritage interpretation through numerous phases in interpretive history. Three main phases are said to have emerged over the years (Butler & Hvenegaard 2002). Their defining characteristics are summarized

below in an effort to trace the evolution of park interpretation as it has adapted to changing worldviews and subsequent conservation norms.

Phase I. Celebrating the aesthetics of parks for people

The first phase of interpretation built upon the efforts put forth around the mid 1800's in America's national parks. In Canada, the first interpretive publication was released in Banff National Park in 1914 (Butler & Hvenegaard 2002). At this time, interpretive programs were "concerned with acquainting visitors with the natural features in the park, often the most dramatic, majestic, and exceptional" (Butler & Hvenegaard 2002: 182). Any focus paid to the environment was couched in human interests with an emphasis on the outstanding aesthetic value parks had to offer. The Mountain National Parks saw the first seasonal interpreters hired on as employees of the parks, and supported the first wildlife warden to conduct nightly discussions on beaver life history while feeding the animals aspen cuttings before crowds of tourists. At this point, the term ecological integrity had not yet been coined.

Phase II. Celebrating parks as pristine wilderness

By the late 1950s ecological awareness was growing, giving birth to a new phase of interpretation, which focused more on interrelationships between nature, ecology, and the landscape as a whole. It was no longer just the dramatic and majestic features of parks that warranted the attention of interpretation; rather attention was now paid to all ecological management concerns within park boundaries. The first permanent naturalists were hired in the Mountain National Parks in 1964. It was around this time that the idea of preservation took hold. Interpretive messaging drew upon the ideas of parks as pristine and wild places distinct from comparatively civilized (albeit destructive) human activities. The term ecological integrity was still not a mainstream concept.

Phase III. Protecting ecological integrity

The third phase began in the early 1970s in response to a broader expansion of environmental consciousness amongst the general public. As new management and policy perspectives emerged affirming that the natural environment contained within national parks cannot thrive independently of surrounding ecosystems indefinitely, park interpretation began to shift away from solely an internal focus, to include a broader ecosystem point of view. Thus it was suggested that a well-rounded interpretive program would serve to awaken public awareness of park purposes. During the third phase, the concept of ecological integrity was developed and eventually accepted as the Park Canada Agency's primary management objective.

By the 1980s, interpretive literature generally accepted that relatively undisturbed park environments were ideal locations for the development of a robust interpretive service focused on promoting a new philosophy and ethical system to help promote the protection of ecological integrity in national parks (Orams 1995; Ham 1992; Kohl 2005; Knapp 2005). In addition, increased attention paid to the state of ecosystems surrounding parks and their influence on the ecological integrity within park boundaries influenced interpretation professionals to call for the broadening of interpretation to include ecosystem-based messages (Cable & Cadden 2006). During this time environmental education emerged as an independent discipline in schools and community settings (United Nations Educational, Scientific and Cultural Organization (UNESCO) 1978). It was also during this period that the terms *environmental* or *ecological interpretation*, with their stronger focus on the natural environment, emerged and were distinguished from *heritage interpretation*.

Despite the increased attention paid to ecological interpretation, many scholars continue to argue for an interpretive approach that targets a broader environmental consciousness (Butler & Hvenegaard 2002; Dearden & Dempsey 2004; Kohl 2005; Sandford 2007). One such example includes the argument that park interpretation for ecological integrity should more explicitly target visitor actions both inside and outside park boundaries (Kohl 2005; Sandford 2007.) The degree to which this "new" form of

ecological interpretation has taken root within Canada's national parks has not been examined. Within the Mountain National Park context, this thesis aims to make a contribution in this direction.

2.5.1 The place of interpretation in park management for ecological integrity

Numerous studies and Park reports over the years have provided encouraging evidence of interpretative and educational efforts having an overall positive impact on the protection of the natural environment (PCA 2000: 10-3; Hendee & Dawson 2002; MPHIA 2006; Marion & Reid 2007). Parks Canada has acknowledged the tangible benefits that result from park interpretive efforts, since they help to garner public support for the protection of parks, and thereby, accrue benefits to the visitor, park environment, park agency, and broader ecosystems (Butler & Hvenegaard 2002: 199; Beck & Cable 2002; Kohl 2005). Two sample quotations follow.

Heritage presentation is the way to gain public support. Without continuous public support in the future, Parks Canada is unlikely to achieve its ecological integrity objectives (PCA 1998: 1).

One way to ensure that our parks are preserved for future generations is to educate and involve the public. By encouraging participation in various park programs, Parks Canada can help ensure that school children, stakeholders and visitors come to appreciate ecosystem-based management and become responsible stewards of their heritage and ambassadors for national parks (PCA 1997: 49).

It is important to acknowledge that, despite the appearance of organizational support for interpretation, the importance of interpretation has not regularly been reflected in the staffing, and budgeting priorities of Canada's parks. Massive budget cuts that accompanied the general downsizing efforts in the late 1980s were so severe in the interpretive sector that most interpreters were laid off, and many went from full time to seasonal status (Butler & Hvensgaard 2002).² Currently, very few full time interpreters

² While funds for education increased slightly in the early 2000's, the latest report on Parks Canada's Plans and Priorities reveals estimates that are projected to disproportionately cut funds for "public appreciation and understanding" initiatives from 2006-2007 levels of \$68,081 to \$28,817 by 2009-2010 (PCA 2007: 58).

are employed by the agency. Despite the potential use of interpretation as an effective management tool, the development of interpretation and education almost always receives the lowest priority for funding, evaluation, and research in park planning (PCA 2000: 10-8; Kohl 2005; Buter & Hvenegaard 2002; Marion & Reid 2007)

In support of a revived interpretive service, the Panel on the Ecological Integrity of Canada's National Parks Report (the Panel Report) stressed that "[e]cological integrity should be Parks Canada's primary communication message" (PCA 2000: 10-3).

According to the Panel Report, interpreting ecological integrity as a part of the active management of parks would require that park visitors, partners, and the public at large understand the key principles of interpreting ecological integrity. Interpreting ecological integrity would thus require that park visitors, partners, and the public at large understand the following (PCA 2000):

- the local, national and global role of protected areas;
- that ecological integrity is fragile – even apparently wild and beautiful areas are not pristine;
- the significance of threats toward ecological integrity; and
- most importantly, what people can do to help.

The Panel Report goes on to make numerous recommendations on how to elevate the interpretation of ecological integrity in Canada's national parks after observing that ecological integrity was often not the fundamental interpretative message being communicated (PCA 2000). Many of the recommendations made by the Panel Report continue to guide management efforts today. The following three areas of recommendations are particularly relevant to this thesis.

(1) The Panel Report identified elevated reliance on static displays as inappropriate for conveying ecological integrity messages. It suggested more interpretation in the outdoors to provide direct experiences of the park environment. It also recommended that outdoor interpretation go beyond appreciating park scenery and promoting recreational opportunities to include a more genuine focus on ecologically-based messaging (PCA 2000: 10-6).

(2) The Park Report emphasized the need to better integrate park interpreters with ecosystem scientists and resource managers whose main focus is the protection of

ecological integrity, so as to better focus interpretation in this direction. It also identified that Parks Canada interpretive programs needed to include a regional dimension in interpretive efforts to better address the “regional, national, and global contexts” (PCA 2000: 10-18) of ecological integrity.

(3) The Panel Report placed great emphasis on the need to develop clear definitions of ecological integrity for communication purposes. To date, a clear and consistent definition of the principles associated with ecology integrity for inclusion in all interpretive efforts is not determined.

2.5.2 Interpretation in the Mountain National Parks

This section provides additional contextual information on interpretation in Canada’s Mountain National Parks as they apply to the Icefields Parkway region. Like all of Canada’s national parks, interpretation is used in the Mountain National Parks to fulfill the Agency’s responsibility of ensuring that all visitors have the opportunity to learn about, understand and appreciate the area’s natural and cultural history. This work is meant to help foster public support for the protection of these places. Park communication and interpretive efforts are guided largely by the goals, methods, content and target audiences determined by the management plans of each park. For the Icefields Parkway region, interpretive goals and objectives are broadly outlined in both the Banff and Jasper Management Plans. The awareness and education objectives are summarized in Table 1.

Table 1. Education and awareness objectives for Banff and Jasper National Parks (PCA 2007a & PCA 2007b)

	Banff National Park	Jasper National Park
Strategic Objectives	<ul style="list-style-type: none"> To provide opportunities for visitors to learn about the park's natural and cultural resources To manage human use in a way that protects the park's ecological integrity To offer visitors the opportunity to have a safe, enjoyable and rewarding experience in the national park 	<ul style="list-style-type: none"> Canadians and their international guests appreciate and understand the nature and history of Jasper National Parks of Canada and the role the park plays in Canada's national parks system and the Canadian Rocky Mountain Parks World Heritage Site. Information is available to help visitors make informed choices.
Objectives	<ul style="list-style-type: none"> To provide opportunities for park visitors to learn about the park's values, its natural and cultural features, and the ecological issues facing the park To foster realistic expectations on the part of visitors by providing information that helps them understand what a national park can offer and what types of use are appropriate 	<ul style="list-style-type: none"> To ensure that education and awareness programs build on the idea of shared stewardship and involve third parties To foster realistic expectations by providing information that helps visitors understand what a national park can offer and what types of use are appropriate To ensure that all information is accurate and includes national messages

In both Banff and Jasper, there is a common goal of providing visitors with the opportunity to learn, with the *hope* of influencing visitors' values, understanding, and therefore, visitor behaviour. Note that the above park education and awareness objectives (Table 1) identified in the Banff and Jasper management plans focus more on providing the *opportunity* to learn should visitors choose to do so. However, they fail to address specific learning outcomes required for fostering a greater awareness for and protection of ecological integrity. In Banff, ecological integrity is mentioned only in the form of managing human-use, and in Jasper the words "ecological integrity" are not actually used at all. However, Jasper's interpretive objectives are more explicit than Banff's in their efforts to connect the park with the greater ecological and cultural context as recommended by the Ecological Integrity Panel Report.

In combination, the above interpretive objectives are largely consistent with the purpose of interpretation as defined by the Mountain Parks Heritage Interpretation

Association (MPHIA),³ an organization that represents both public and private interpreters and serves as the authority on interpretation in the Mountain National Parks. An MPHIA training handbook states: “the purpose of interpretation can be to create an experience for people, but it can go much further” (MPHIA 2006: 15). While MPHIA maintains that the best interpretation has the *potential* to better inform visitors of, and have an impact on, their actions, opinions, values, and beliefs, doing so is not an interpreter’s overt goal (MPHIA 2006: 15). Here again the potential for interpretation to influence people’s attitudes, beliefs and behaviours towards a respect for the natural environment is evident. However, communicating ecological integrity is not clearly stated as the primary objective of park interpretation.

Two factors may account for the lack of focused attention on educational objectives and associated behaviour change outcomes: the scope of behaviour change objectives associated with interpretation; and a conceptual delineation between interpretation and more formal educational practices associated with learning.

First, the behaviour change goals associated with classic interpretation tend to target localized actions such as encouraging visitors to stay on designated trails, to not feed the animals, or to discourage littering. Interpretation of this kind is site-specific, and its main goals are the mitigation of human-use to protect ecosystems from human activities in the park. These behaviour-change objectives do not focus on developing a broader understanding of environmental issues or an environmental ethic. Standard interpretation is less of a process-oriented and personalized learning journey than a technical instrument used to manage human-use (McCool & Stankey 2003; Ablett & Dyer 2009).

Second, although the terms education and interpretation are often used interchangeably in the Mountain National Parks, MPHIA asserts that they are distinct concepts (2006). Primarily, MPHIA distinguishes interpretive and educational experiences on the basis of ‘setting’, with interpretation taking place in a recreational setting, as opposed to a formal classroom where individuals are *required* to learn. MPHIA asserts that interpretation must be “fun to enrich [visitors’] experience, so they

³ Since the time of research, MPHIA has since changed its name to the Interpretive Guides Association (IGA).

learn something in which they have interest” (MPHIA 2006:15). For MPHIA, an interpretive guide “builds bridges between landscapes, people and history; reveals stories behind the scenery; and creates memorable and inspiring experiences” (IGA 2009: no page provided). Although it is hoped that visitors will learn from this process, MPHIA has not specified educational objectives linked to ecological integrity in the Mountain National Parks, presumably because visitors are free to learn what they wish.

MPHIA’s approach to interpretation may be seen as the guiding interpretive model for region. This standard interpretive model is based upon the following assumptions. Protecting ecological integrity begins with awareness, and progresses from insight to knowledge, understanding, appreciation, respect, love, and finally, to preservation (Canadian Environmental Advisory Council 1991). Making people more knowledgeable about the environment increases their awareness and appreciation, which gives them a positive attitude toward, and respect for, the environment, ultimately leading to positive behaviour change (Butler 1993). The model is epitomized by the often-quoted phrase (Tilden 1977: 38):

Through interpretation, understanding;
through understanding appreciation;
through appreciation, protection.

The assumption is that an informed, and therefore caring public, causes less harm to parks (Butler 1993; Bramwell & Lane 1993; Hungerford & Volk 1990; MPHIA 2006). However, the emphasis placed here on cognitive knowledge loses sight of Tilden’s original tenet that the learning gained from interpretation is itself a process often experientially based (as opposed to starting with cognitive knowledge). Additionally, research in environmental education indicates that knowledge is, on its own, a weak predictor of positive environmental action (Emmons 1997; Hungerford and Volk 1990; Kollmus & Agyeman 2002). Based on guiding interpretive documents for the Mountain National Parks (MPHIA 2006; PCA 2007a; PCA 2007d), park interpretation has been slow to give up a cognitively based educational approach.

While the complexities of behaviour change remain outside the scope of this study, it is useful to note that environmental education researchers have spent much time exploring the complex and non-linear relationships between knowledge, attitudes, and

behaviour (Bright 1994; Hines, Hungerford & Tomera 1987; Emmons 1997; Ham 1997; Kollmuss & Agyeman 2002; Jensen 2002). Furthermore, numerous scholars of interpretation have argued that the learning outcomes associated with park interpretation should include the development of environmentally aware and responsible citizens (Orams 1995; Ham 1997; Negra & Manning 1997; Butler and Hvenegaard 2002: 199). This thesis examines the views of educational professionals on interpretation and park education, comparing these perceptions with the trends identified above.

The following section addresses some of the foundational principles of environmental education, its objectives, its relationship with interpretation, and its potential role in park interpretation for ecological integrity.

2.6 Environmental education

Just as Aldo Leopold was one of the first to refer to integrity in a biological sense, he was also one of the first to speak out about the importance of environmental education. In 1949, Leopold's published work spoke about ecological education as something directed towards changing our "intellectual emphasis, loyalties, affections, and convictions" (1966: 246). It was not until the second half of the 20th century, however, that the need for education focused specifically on the natural environment received international attention. In 1972 the United National Conference on Human Environment made firm recommendations that international programs for environmental education commence as soon as possible both in and outside of formalized school settings (United Nations Educational, Scientific and Cultural Organization (UNESCO) 1978). By 1975, UNESCO and UNEP (United Nations Environment Programme) initiated the International Program for Environmental Education, which was later elaborated on at both the Belgrade and Tbilisi meetings. The Belgrade Charter of 1975 resulted in what is still widely accepted as a common goal of environmental education (NAAEE 1999).

The goal of environmental education is to develop a population that is aware of, and concerned about, the environment and its associated problems, and which has the knowledge, skills, attitudes, motivations and commitment to work individually and collectively toward solutions of current problems and the prevention of new ones (UNESCO 1978: 7).

Just two years later, the first Intergovernmental Conference on Environmental Education issued the Tbilisi Declaration of 1977 that built upon the Belgrade Charter to define environmental education as a learning process that seeks to recognize the connection between the natural and human-made environments, and environmental interdependency amongst nations (UNESCO 1978). Significantly, the Tbilisi Declaration, and other subsequent documents⁴ emphasized the notion of environmental education as a life-long learning process to encourage the development of knowledge, awareness, critical thinking, environmental ethics, and social values sensitive to environmental issues. Furthermore, the notion that citizens must participate in efforts to protect the environment is viewed by many scholars as an ultimate goal of environmental education (Emmons 1997: 34).

An examination of environmental education literature to date reveals a growing consensus on the need for interdisciplinary and holistic approaches. From this standpoint, environmental education in a manner should encompass the biophysical, socio-cultural, political, economic, technological, moral, aesthetic and spiritual aspects of the subject matter at hand (Orr 2004). Environmental education needs to be cognoscente of temporal and spatial dimensions, meaning that it should present issues that address both local and global, as well as past, present and future contexts. It also should focus on the interrelationships and interconnections between humans and the natural environment (Palmer & Neal 1994).

⁴ Subsequent documents include *Our Common Future*, produced by the World Commission on Environment and Development in 1987, *Agenda 21*, produced by the United Nations Conference on Environment and Development. Both of these reports introduced sustainable development to the realm of environmental education, a link that endures today (NAAEE 2002).

2.6.1 *Objectives of environmental education*

This next section highlights some of the most prominent learning objectives identified by scholars as necessary components of environmental education. Generally, the foundational purpose of environmental education is to produce environmentally responsible and active citizens (Chawla 1998; Hungerford & Volk 1990; Jensen 2002; NAAEE 2002). Assessing the environmental literacy of a population, or a group of learners, is one way of determining the success of this desired outcome. An environmentally responsible or literate citizen is someone who has:

[a]n awareness and sensitivity to the total environment and the allied problems (and/or issues); a basic understanding of the environment and allied problems; feelings of concern for the environment and motivation for actively participating in environmental problems (and/or issues); and active involvement at all levels working towards resolution of environmental problems (and/or issues) (Hungerford & Volk 1990: 9).

Implicit in the purpose of environmental education are three primary educational objectives, which correspond with earlier models that focused on increasing people's *knowledge* of the environment, their positive *attitudes* towards the environment, and their environmentally responsible *behaviours* (Hungerford & Volk 1990). There is not a linear relationship between people's knowledge of environmental issues and their positive environmental attitudes and behaviour (Hines et al 1987; Kollmus & Agyeman 2002). There are important, additional predictors of positive environmental behaviour. These predictors are captured well in what Emmons (1997) proposed as a model for positive environmental action with three tenets.

First, the emphasis is on fostering *action*, as opposed to behaviour. Action, as a goal of environmental education, differs from behaviour in that it is "a deliberate strategy that involves decisions, planning, implementation, and reflection by an individual or a group" (Emmons 1997: 35). Defined in this way, action has an intentional quality that does not necessarily characterize behaviour. Behaviors that occur out of habit, or prescription have not necessarily occurred out of deliberate efforts. Actions, on the other hand, involve efforts based on certain knowledge or attitudes about a subject. For Jensen

(2002), “action should be directed at solving a problem and it should be decided upon by those preparing to carry out the action. ... [A]n action is targeted at change: change in one’s own lifestyle, in the school, in the local or global community” (326). From this standpoint, action better represents the goals of environmental education, being to change people’s behaviour *alongside* their attitudes and knowledge.

Learner actions born out of educational efforts are both processes and products, and therefore are themselves a part of the educational process (Emmons 1997; Jensen 2002). This differs from behaviour, which is often just a product, since learners were not necessarily engaged in the effort leading to their behaviour change. Often times, efforts to educate individuals about the environment rely too heavily on scientific knowledge. “Such knowledge can create a great sense of worry, and if it is not supported by insights into causes and strategies for change, then it may contribute to weakening commitment and result in paralysis” (Jensen 2002: 331).

Second, the model focuses on the integration of numerous learning areas, including environmental concepts, attitudes and sensitivity, as well as action skills, empowerment and ownership variables (Emmons 1997). It is the combined effects of these learning areas that influence participants towards positive environmental action, in a way that is interactive, dynamic and in touch with social context. Environmental sensitivity has been defined as “a predisposition to take an interest in learning about the environment, feeling concern for it, and acting to conserve it on the basis of formative experiences” (Chawla 1998: 19). Action skills present learners with the tools to put knowledge of an issue into action (Jensen 2002). These action skills may be direct or indirect. For example, demonstrating against traffic conditions is as valid an approach as putting up signs asking people to slow down for wildlife. Ownership variables make issues important at a personal level, and empowerment variables help foster a sense that one’s decisions and behaviours can have tangible impacts on the situation at hand (ibid).

Finally, the model of positive environmental action focuses on the power of experiential learning, and the potential of non-formal settings (such as park interpretation). Many have argued that environmental sensitivity is gained through positive contact with the natural world (Hungerford & Volk 1990; Horwood 1991; Louv 2008; Ballantyne & Packer 2002). Indeed, it has been argued that the world’s collective

environmental sensitivity has drastically decreased in an increasingly urbanized and wired world wherein the general population is spending drastically less time immersed in nature (PCA 2003; Chawla 2002; Orr 2004; Louv 2008). Non-formal educational settings, such as park interpretive opportunities, are ideal for facilitating intensive and direct experiences in natural settings without many of the constraints of formalized educational settings. Non-formal educational settings make it easier to avoid many of the challenges commonly associated with the delivery of robust environmental programs (Emmons 1997: 36). Educational materials that focus too narrowly on basic knowledge are replaced with programs designed to better address all of the learning areas.

In the following section a direct comparison of the basic tenets of environmental interpretation and environmental education are made to better assess the potential for collaboration between the two.

2.7 Comparing environmental education & interpretation

Incorporating non-formal environmental education into interpretive efforts within park settings presents interesting opportunities for collaboration between the fields of interpretation and environmental education (Ham 1997; Littlefair 2003; Cable & Cadden 2006). However, there is debate over what delineates and connects these fields (Civitarese, Leg & Zeufle 1997; Knapp 2005; Cable & Cadden 2006). For Grant Sharpe, “environmental education is not a substitute but should be regarded as an extension of interpretation” 1982: 25). For others, the order of this claim has been reversed, while an additional group of writers prefer to see them as separate and uniquely identifiable activities (Cable & Cadden 2006). In this section, key environmental interpretation and education characteristics and worldviews are briefly compared and discussed.

2.7.1 Characteristics, purpose and evaluation criteria

Interpretation is most commonly distinguished from environmental education based on the settings in which these activities take place (Sharpe, 1982; Civitarese et al. 1997; Littlefair 2003; Knapp 2005). From their perspective, interpretation tends to be

characteristic of activities that are voluntary and take place within recreational settings (Sharpe 1982; Civitarese et al. 1997; Knapp 2005). Conversely, environmental education has been distinguished from interpretation in the past since it tended to involve formal institutions and require students to participate in a sequential learning process (*ibid*). More recently, however, the presence of non-formal environmental education has increased in settings outside of schools and institutions (Wiltz 2000; Taylor & Caldarelli 2004; CEGN 2006).

Another common delineation focuses on the issue of time. Due to the nature of recreational settings, interpretive activities tend to be short (no more than a couple of hours). It has been argued that this lack of time limits the capacity of interpreters to affect long-term changes in their audiences, such as attaining the sensitivity, knowledge, skills and attitudes necessary to activate positive environmental ethics and practices (Knapp 2005). As such, it has been observed that standard interpretation focuses more on short-term processes designed to deliver information and provide enjoyable experiences (Ham 1997; Civitarese et al. 1997; Knapp 2005; Cable & Cadden 2006). In comparison, it has been argued that environmental educators have more time with learners (lengthy or multiple sessions), and are thereby able to focus on curriculum-driven teaching and behaviour changes in people's everyday lives, as opposed to just site-specific behaviours (*ibid*).

Finally, interpretation and environmental education do not typically have the same evaluation criteria. In fact, classical interpretation does not often have a program development paradigm, which has resulted in very little program evaluation and impact analysis focused beyond audience satisfaction (Knapp 2005, Littlefair 2003). Conversely, the field of environmental education's evaluation focus lies within more formal assessments of learning and impact analysis (*ibid*).

Despite these common delineations, however, not everyone views interpretation and education as easily distinguishable fields (Sharpe 1982; Ham 1997; Wiltz 2000; Beck & Cable 2002; Cable & Cadden 2006). Calls for greater cooperation between the fields of interpretation and education have been made (*ibid*). Furthermore, it has been argued that education and interpretation share strikingly similar philosophical roots (Cable & Cadden 2006). As such, the above differentiations of interpretation and education are not

inevitable, rather they simply represent current trends in the ways each of these disciplines are commonly utilized (Ablett & Dyer 2000; Cable & Cadden 2006). In one paper written by Ted Cable and LuAnne Cadden (2006), Freedman Tilden's six principles of interpretation developed in the 1950s and John Dewey's progressive educational philosophy from the 1920's were compared. They determined that the "foundational principles of interpretation and environmental education are nearly identical" (Cable & Cadden 206: 45).

The nature of both Dewey's educational philosophy and Tilden's principles of interpretation are reflected in Dewey's belief on that,

...learning that develops intelligence and character does not come about only when the text book and the teacher have a say, that every individual becomes educated only as he has an opportunity to contribute something from his own experience, no matter how meager or slender that background of experience may be at a given time, and finally that enlightenment comes from the give and take, from the exchange of experience and ideas" (Winn, 1972:123).

Similarly, Ablett & Doyle (2009) point out that interpretation as it was (originally conceived) was not meant to be a cognitive process alone. Rather, it was meant to facilitate a fundamentally transformative *praxis* whereby visitors are encouraged to (re)experience heritage (cultural and ecological) in a holistic manner (*ibid*). In essence, Tilden's vision of interpretation was about the deepening of relationships between visitors and their surrounding environments, so that people saw themselves as inseparable from a broader ethical discourse tied to conservation.

The Parks Canada Agency cites Tilden's principles of interpretation as the agency's guiding interpretive goals (PCA 1998; PCA 2000b). However, with the institutionalization and commodification of National Parks as tourism sites, it has been suggested that the current focus of interpretation has lost its value-driven, transformative roots (Ablett & Dyre 2009). Within this context, increased attention has been paid to the potential of interpretation as a "management tool" for mitigating/controlling visitor behaviour, and for its ability to entertain the masses (Sharpe 1976; Beckman 1988; Ham 2002). Certainly, the idea that interpretation should be an entertaining and enjoyable experience signifies one of the strongest links between the organization's education and visitor experience objectives.

Within standard park educational approaches, scholars have observed that interpretation (as a management tool) has become something that managers and interpreters plan to deliver *to* people (Uzzel 1998, Ablett & Dyre 2009). This is contrasted with an experiential process that people might participate in *with* their interpreters and guides, or *for* themselves (*ibid*). Interpretation, therefore, is no longer purported or supported as a transformative educational *practice* based on care for, and relationships with, the environment (Stewart et al. 1998) in which the visitor's potential wisdom is nurtured and respected (Ablett & Dyre 2009). Additionally, the holistic educational outcomes originally associated with heritage interpretation have been overshadowed by an increased emphasis on the instrumental, technical, and entertaining potential of interpretive programming.

Some interpretive scholars have criticized the content of current interpretive programming in national parks for losing site of “the bigger picture” (Uzzel 1998), and urge that the role of interpretation should be to present alternatives for the future direction of society (Uzzel 1998, Ablett & Dyre 2009). Interpretation from this standpoint more closely represents the transformative vision for society envisioned by Tilden in the first place (Ablett & Dyre 2009). Additionally, bigger picture goals echo the goals of environmental education to produce environmentally sensitive and responsible citizens (i.e., Emmons 1997).

In summary, it appears that much of the current distinctions made between environmental interpretation and environmental education are based on common and historical interpretive practices in parks, and not necessarily their foundational philosophies and associated purpose. However, educational practices in parks are unlikely to contribute much towards the goal of fostering a positive environmental ethic when the objectives of interpretation have not been mindfully developed in conjunction with the purpose and objectives of environmental education.

2.7.2 Comparing worldviews between interpretation, environmental education and ecological integrity

It is possible to make connections between the previously discussed perspectives on ecological integrity and the predominant characteristics of environmental education and standard interpretation. (See Figure 3 at the bottom of this section). For example, parallels between the characteristics of standard park interpretation and normative worldviews can be made. Interpretation has been used primarily to manage/control human use in accordance with the rules and regulations of the park agency, and as a tool to gain support for park management practices aimed at the protection of natural resources. Interpretation reinforces a hierarchical and regulatory approach to environmental management. In addition, the dominant park interpretation framework is based upon a cognitive approach to learning (Ablett & Dyer 2009), which corresponds with normative views that privilege scientific knowledge as the ultimate form of “truth” (Manuel-Navarrete *at al.* 2004).

Conversely, common forms of environmental education suggest pluralistic worldviews (see glossary). Environmental education places more emphasis on multiple ways of knowing and learning (Jensen 2002). This is demonstrated by the importance environmental education places on emotions, attitudes, and individual’s predisposed values and ethics, all of which have been determined to influence individuals’ environmental attitudes and sensitivity, action skills, empowerment and ownership variables (Hungerford & Volk 1990; Emmons 1997; Knuz; & Ham 1997; Negra & Manning 1997).

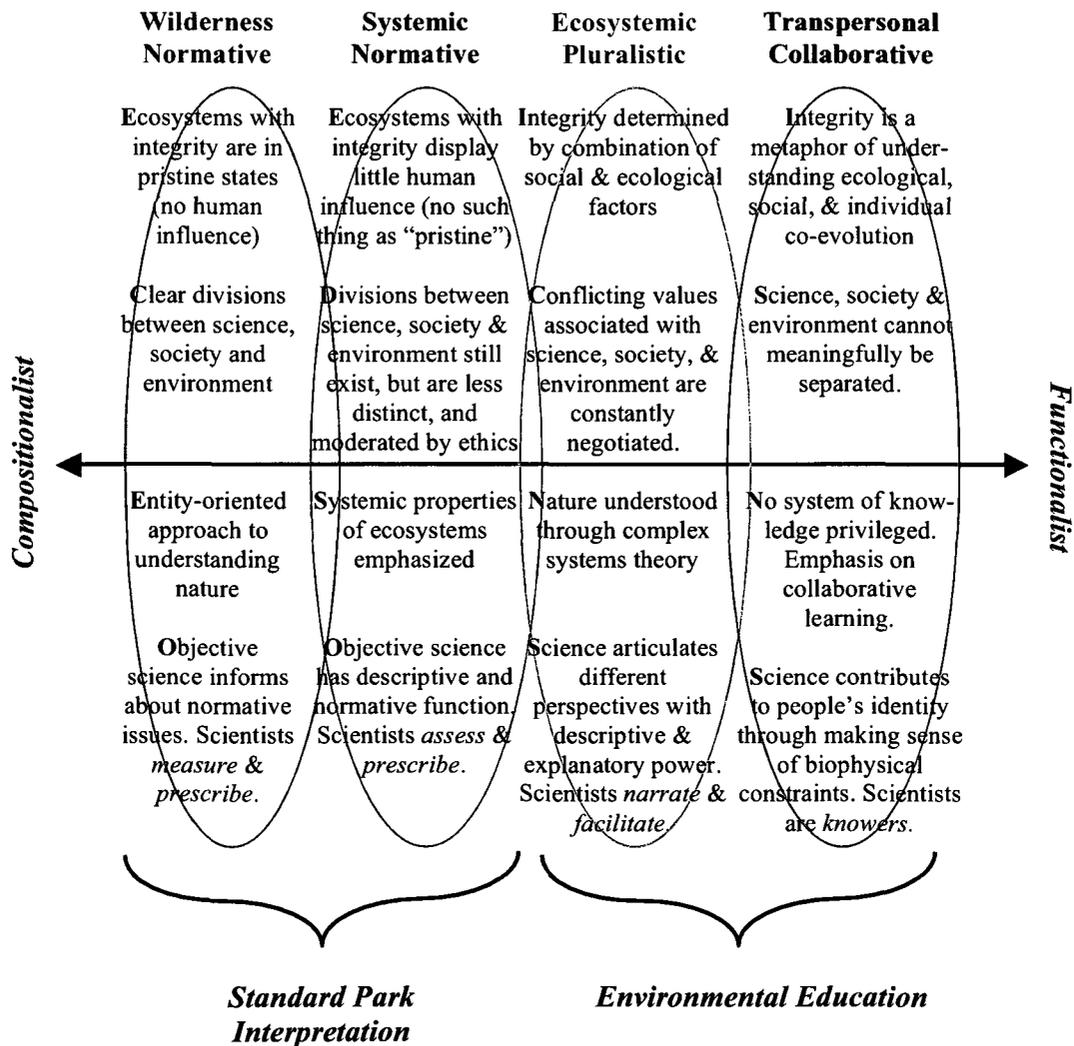
Additionally, the environmental education paradigm is founded on the notion that citizens must participate in the protection of the environment (Emmons 1997). This differs from normative approaches to education, which in a parks context relies on ecosystem scientists and park managers to determine interpretive messages, usually aimed at mitigating (controlling) human-use (PCA 2000; McCool & Stankey 2003; Littlefair 2003). Environmental education also emphasizes educational efforts that are multi-disciplinary (Ham 1997; Orr 2004; Rickinson 2006), whereas standard environmental interpretation in parks has been criticized for a narrow focus on ecological

issues isolated from broader social, economic, and political contexts (PCA 2000; Stewart, Glen, Daley & O'Sullivan 2001; Orr 2004; Ablett & Dyer 2009).

Finally, the strong theoretical link between sustainable development and environmental education (Rickinson 2006) provides additional evidence of the pluralistic view that humans are inseparable from the natural environment. Interestingly, in Tilden's original conception of interpretation (1977), "heritage interpretation aimed to disclose the significance of both natural and historio-cultural sites to contemporary visitors ... [implicitly challenging] a long-standing dualism in Western thought that radically separates nature from culture" (Ablett & Dyer 2009: 210). However, Tilden's original intent was to reject the "nature-culture binary by adopting an inclusive notion of *heritage* that interpreted nature through cultural mediation" (210). This educational approach seems to have been lost in contemporary park interpretation.

Ablett and Dyle (2009) explain that after approximately thirty years of concerted attempts to re-frame heritage interpretation from a historico-cultural interpretation of nature to the narrower focus of "environmental interpretation" (i.e., Ham 1992; Leung & Marion 2000; Littlefair 2003; Knapp 2004), most park interpretation today emphasizes an "objectivist, Western scientific paradigm, (which underpins cognitive models)" (Yankelovich 1991, Ablett & Dyer 2009: 211). It has therefore been suggested that the predominately cognitive approach to interpretation risks reducing Tilden's conception of interpretation to "a unilateral presentation of '*information*,'" which he specifically sought to avoid (Ablett & Dyer 2009: 211). With this in mind, concerns over the associated content and epistemological grounds of dominant interpretive models today have caused one writer to assert that contemporary interpretation "is stuck in a rut where the how has become more important than the why" (Uzzell 1998, 12).

Figure 3. Conceptual diagram of ecological integrity, standard park interpretation and environmental education.



2.8 Synthesis of concepts

There are numerous ways in which the ecological integrity concept has been defined, and each corresponding discourse presents variations in the way the natural environment is conceptualized, managed, and interpreted to others. Acknowledging the diversity of these discourses within a variety of contexts is important, since recognizing the dominant discourse within the realm of protected areas management has the potential to increase the transparency of contextual decisions (Manuel-Narvarrete et al. 2004).

In the past, the Parks Canada Agency has supported a normative approach to managing for ecological integrity. However, an “integrated” approach to park management, has replaced the traditional “dual mandate” in recent reports (Rettie 2006a, PCA 2007b, PCA 2008b), supporting a more ecosystemic-pluralistic worldview. However, apart from statements of support for the integrated approach, there is little guidance on how a pluralistic approach differs from the traditional “use *versus* protect” model.

Studies have shown that being explicit about the social values associated with ecological concepts, such as ecological integrity, improves the clarity of management goals and objectives (Maguire 1996; Hull et al. 2003). Not surprisingly, it has also been suggested that an assessment of the values and beliefs held by non-formal educators would help to identify the unexamined philosophical messages communicated to learners during educational activities, and yet such assessments are largely missing from the literature (Taylor & Caldarelli 2004). Since beliefs have been proven to play a significant role in determining how people organize knowledge/information, and help people adapt, understand and make sense of themselves and their surrounding environment (Schommer 1990, Taylor 2003), determining what ecological integrity means to educators, and how it is thus presented to the public warrants exploration.

Despite Parks Canada Agency reports establishing the ecological integrity mandate, there is little guidance on how a pluralistic ecological integrity definition can/and or should be transmitted into the organization’s supporting mandates of providing visitors with quality education and experiences. Therefore, it is important to speak to front-line professionals who interact daily with the public about their perspectives of ecological integrity, and how an ecological integrity mandate might be communicated to the public. This exploration is particularly relevant in the Icefields Parkway region because it has been identified as the “flagship” for the “integrated mandate.”

CHAPTER 3 METHODOLOGY

3.1 Qualitative research and social phenomenology

This study takes a phenomenological social science approach to explore the concept of ecological integrity as it pertains to education and visitor experience. To date, most “ecological stressors” of concern to ecosystem biologists have been linked to human activity within the environment, and thus carry with them a distinctly social element. Per Nilsen notes that in order for Parks Canada’s current ecological integrity monitoring program to be successful, it “must utilize a combination of both natural and social sciences to establish goals and objectives, with appropriate indicators, targets and associated protocols on a variety of scales, to monitor and report on the state of ecological integrity in national parks” (Nilsen, 2003: 5). Yet there is little research to date that has examined the social implications of management objectives as they unfold on the ground. This research aims to make a contribution to this end.

This is an interpretive study with a conceptual framework and methodological design informed by Schutz’s theory of social phenomenology (Fereday & Muir-Cochrane 2006). The aim is to understand how members of a social group interpret the world around them, and place those interpretations within a social scientific framework (Bryman & Teevan 2005). Social phenomenology focuses on people’s experiences and social relationships as a means of investigating these interpretations (Bryman & Teevan 2005). This theory “takes the view that people living in the world of daily life are able to ascribe meaning to a situation and then make judgments” that influence their social lives (Fereday & Muir-Cochrane 2006: 2). It is the subjective meaning associated with the ecological integrity concept, and the subjective experiences of educating the public towards an understanding and appreciation of this concept, that is the topic of this research.

3.2 Methodological Overview

The primary goal of this study is to explore the social meaning of ecological integrity for individuals whose educational work is meant to foster an appreciation and support for protecting ecological integrity within protected areas. The secondary goal of this study is to identify educational experiences in a protected areas setting that honours the social meaning of ecological integrity. Study findings associated with these goals have been generated by way of an extensive literature review, participatory site visits, key informant interviews and focus groups. The methods presented here involve five major phases.

The first research phase involved an extensive literature and policy review. This aided in the selection of initial research questions, and possible categories for future analysis. These questions and themes were then tested in the second phase of research during a pilot focus group held in December of 2006. The third phase of research, marking the beginning of formal field study, involved four site visits in the late spring and early summer of 2007. At this point research questions created during the first research phase were adjusted to suit the local context of the Mountain National Parks, and the Icefields Parkway region more specifically. During this time period, individuals were identified and contacted for the fourth phase of research involving a series of key-informant interviews and focus groups. While key informant interviews and participatory site visits took place interchangeably throughout the spring and summer, all focus groups were held in early fall. All data sources were consolidated for thematic analysis.

A combination of inductive and deductive methods and modes of analysis were employed. In the conceptualization and design phases of this study, research questions and a preliminary code sheets with *possible* units of analysis were developed based upon existing ecological integrity and educational theory. This deductive method of identifying useful questions and possible coding options, helped to ensure that the general research thrust remained relevant with respect to the existing body of literature explored during

the study's literature review. Although original research questions and proposed coding methods were born first from existing social theory, all aspects of the research design remained flexible and responsive to the context and realities of the case study site and research subjects. Therefore, the above mentioned deductive methods were combined with an inductive approach in which coding categories and analysis of interviews and focus groups were generated from the words of participants bearing both *a priori* and emerging concepts in mind. This allowed for the development of more sophisticated questioning and collection of data in the participants terms throughout the research process.

This study was approved by the Dalhousie Board of Ethics. The remainder of this chapter describes in greater detail the research methods and modes of analysis selected for this interpretive study.

3.3 Use of Literature

This study began with an extensive review of four bodies of literature. The first focuses on the foundations of the ecological integrity concept. This literature addresses all major streams of thought associated with the ecological integrity concept and its primary applications as a current ecological normative. The second explores the ecological integrity definition and relative positioning within the Parks Canada Agency. This includes policy addressing the historical and contemporary positioning of ecological integrity within protected areas management. Special attention was paid to policy papers addressing the relationship between the Agency's mandated goals of managing for ecological integrity in conjunction with providing educational and experiential opportunities to park visitors.

The third focus addresses the foundational principles of interpretation in Canada's national parks. This review explores the history of interpretation as a method of educating the park visitors about ecological integrity. Finally, the literature associated with environmental education was included. The foundational definitions, goals, philosophy and educational methods commonly associated with park interpretation and environmental education were compared and contrasted.

The literature examined for this research came from a combination of peer-review journal articles, books, Parks Canada Agency reports and policy papers, newsletters from local educational organizations, and other educational resources intended for interpreters in the Mountain National Park region. Support from Parks Canada for this research allowed for open access to an internal library. This is where most reports and policy papers reviewed for the thesis were acquired. The literature review helped to identify gaps in knowledge, thus aiding in the creation of research questions, ensuring that study findings made meaningful contributions to existing bodies of literature. The examination of the literature was ongoing throughout all research phases, since interviews, focus groups and participant observations presented additional information warranting further exploration.

Organization and analysis of literature resources took place by way of detailed note taking and documenting of emerging themes, inconsistencies, and emerging questions. The literature review ceased once a saturation point was achieved, whereupon major themes, authors cited, and implications for research were found to repeat themselves and no major new findings applicable to the study focus emerged.

3.4 Study participants

This study generated results from interviews and focus groups with individuals who have an active role communicating park values and ecological integrity to the public. Input was sought from professionals in the field with considerable experience working along the Icefields Parkway, and the Mountain National Parks more generally. It is important to note that this study did not explore visitor perceptions of ecological integrity, and therefore, did not identify park visitors as research participants. Unlike the majority of recent studies pertaining to visitor experience and education, this study did not ask visitors what they would *like* to learn, it asked individuals with many years of experience working with park visitors what they thought needed to be *taught*. While this is a strength of this study, it is also a limitation.

Participants were contacted by electronic mail (email), and then by telephone to request their participation in either an interview or focus group discussion. A snowball

sampling method was employed to identify potential participants whereby research participants helped to identify additional research participants (Seidman, 1998).

3.5 Participant observation

I familiarized myself with the study location and existing educational opportunities along the Icefields Parkway through observation. Through *active participation* (Dewalt & Dewalt, 2002: 20), I engaged in many of the activities in which visitors to the Icefields Parkway region participate. This was a means to identify and understand the activities themselves, and the cultural significance behind people's involvement in them.

On two occasions I cycled the Icefields Parkway (Hwy 93) to gain an intimate perspective of the study area located between Jasper and Lake Louise. The first cycling trip took a total of five days (four nights), with one night spent in a shelter available to researchers and Parks Canada personnel. All other nights were spent in public campgrounds along the way. The second trip took three days (two nights) to complete, and all nights were spent in campgrounds. Both of these trips took place during the summer of 2007. These trips provided opportunities for participant observations of "people in their own time and space" (Burroway 1991: 2).

Being a participant-visitor to the Icefields Parkway region provided experiences not easily replicated within interviews or focus groups. These experiences highlighted the nature of visitor interactions, the condition of interpretive media, and other phenomena not foreseen during the proposal phase of this research. Furthermore, engaging in participant observations as a cyclist helped to dispel some of the challenges commonly referred to as "gaining access in the field" (Dewalt & Dewalt, 2002: 37.) As an individual engaging in my own personal journey I found it easy to strike up conversations with guides, interpreters, bus drivers, facility managers, Parks Canada personnel, and of course, park visitors.

Two additional site visits took place throughout the summer, during which I traveled the Icefields Parkway by car. During these visits I partook in two guided hikes, a motorized tour of the Athabasca glacier, an interpreted coach tour, and spent one evening

at a hostel. Through personal observations and experiences along the Icefields Parkway, I became better informed of the built environment as well as the natural and cultural topography of the region. During all site visits I recorded pertinent experiences, observations and conversations in a field notebook. This information was used to help guide the identification of research participants as well as to re-frame (where necessary) interview and focus group questions.

Participant observations also occurred through the periodic use of an office space shared by Parks Canada communications, interpretive, and enforcement staff. This provided valuable insight into the preparations that went into interpretive programs, and the behind-the-scenes attitudes and impressions of particular educational activities to park staff.

3.6 Recruitment

In consultation with the thesis committee, five stakeholder groups were identified and at least one individual from each of these groups was contacted for a key-informant interview as a means of initiating a snowball recruitment method for both interviews and focus groups. These initial groups included at least one representative from the Icefields Parkway Planning Initiative committee, the Banff-Eco Integrity Project, an educational expert from an environmental not-for-profit organization, a professional interpreter on MPHIA's board of directors, and an upper level manager from one of the larger business operations in the area (such as Brewster.) These stakeholder groups were identified to adequately represent the major players delivering educational initiatives in the Icefields Parkway region. Unfortunately, two additional groups were not accounted for in the original recruitment framework nor interviewed for logistical reasons. First, Japanese tour guides were not interviewed, due in part to language barriers encountered during the thesis-proposal stage, and a lack of clarity over which guiding organizations were the most predominate in the field. Second, unlicensed step-on guides were not interviewed, who originated from distant locales like Vancouver. They accompany international guests and were difficult to identify, as there was no organizational apparatus through which to contact these individuals.

Key-informants were asked to suggest additional people in the region with valuable insight and experience on the educational climate of the Icefields Parkway region. Once an individual had been mentioned a number of times, a convenience sample was compiled and a snowball sampling method initiated.

As the list of potential interview and focus group participants grew, potential interview participants were contacted by e mail and then phone if they met any or all of the following criteria:

- Individuals who held influential positions within the Parks Canada Agency related to park interpretation and communications affecting the Icefields Parkway region;
- Individuals who were managers and or program directors of popular tour organizations who specialized in public interpretation, education, or guided mountain experiences.

For potential focus group participants, the above criteria were considered in combination with the following:

- Individuals who have dealt with large numbers of park visitors for extended periods of time in the Mountain National Parks;
- Individuals who had been recommended by others as highly knowledgeable and personally engaged in park education. Once an individual had been recommended at least twice, they were contacted.

Approximately two thirds of the individuals contacted for focus groups expressed interest, and approximately 75% of these individuals actually participated. Similarly, with regards to interviews, approximately 75% of individuals contacted were also interviewed.

The following two sections provide more detail on interview and focus group procedures.

3.7 Key informant interviews

Semi-structured, key informant interviews were employed using a style of interviewing with the following broad characteristics:

... the researcher has a list of questions or fairly specific topics to be covered, often referred to as an interview guide, but the interviewee still has a great deal of leeway in how to reply. ... Questions may not follow the exact order on the schedule and some questions not included in the guide may be asked as the interviewer picks up on things said by the interviewees (Bryman & Teevan, 2005: 184).

Interviews were primarily used to engage individuals who were particularly knowledgeable in education or interpretation in the Mountain National Parks and/or Icefields Parkway region. The interviews were used to gain access to pertinent information on the social dimensions of current educational initiatives, projected plans for the region, and insight from professionals in the field of environmental education on the prospects of communicating the values of ecological integrity along the Icefields Parkway. In addition, these interviews helped to select potential focus group participants and define focus group questions. Interviews varied considerably in length, ranging from 15 minutes to two hours. A diverse range of questions was asked during the interviews depending on an individual's area of expertise and knowledge of the Icefields Parkway region. While the interview style and questions were consistent throughout the research (see interview guide in Appendix A), small differences can be attributed to the diversity of interviewees, stakeholders, and settings in which the interviews took place.

In total, 22 individuals were interviewed in positions of leadership or management, involved in communicating park values to visitors, such as chief communications officers, senior interpreters, natural history authors, accredited independent professional interpreters, and educational consultants. Interviewees included individuals from multiple stakeholder groups: Parks Canada interpretation; Parks Canada communications; Parks Canada highway maintenance; independent tour operations managers; members of the Icefields Parkway Planning Initiative; non-profit educational organizations; non-profit environmental advocacy groups; and interpretive media consultants.

The total pool of 22 completed interviews is comprised of two semi-structured interview types. The first pool of nine interviews focused on questions related to the individual's normal employment duties and provided valuable background information.

For these interviews, verbal consent was obtained, but no direct quotations were used in the analysis of the study data.

The second pool of interviews was more formal in nature. In addition to asking questions related to the individual's normal employment duties, these interviews asked participants to share their personal thoughts and opinions on the subject matter at hand. For all thirteen of these interviews, written consent and permission to audio-record interviews, was obtained. These interviews were audio-recorded, transcribed and formally analyzed. Interview locations varied depending on interviewee preference and convenience. In some cases interviews were conducted at interviewees' places of work, while others took place in public settings such as local cafés or park benches. In all situations, detailed interview notes were maintained, recording any relevant information regarding the interview setting, interviewee body language, and other key points of interest.

3.8 Focus groups

Participant responses gathered from three focus groups in the summer of 2007 provided the bulk of the data for this study. Essentially, a focus group is a “group interview with an interest in how people, in conjunction with their interactions with one another, feel about selected general topics” (Bryman & Teevan, 2005: 194). Researchers have used focus groups in the past as a technique to dig deeper into subject matter as a means of understanding more than just *what*, but *why* people think the way they do (ibid). The very premise of this research was to uncover the diversity of opinions, thus it made sense to use a research method designed for this purpose (Kreuger & Casey 2000).

Part of the rationale behind choosing the focus group method is that it provided a rare forum for stakeholders who otherwise would not meet. It facilitated collaboration between all involved parties and further developed an understanding of the issues at hand. In this setting, group dynamics can often influence the acquisition of knowledge; such as when an individual modifies their understanding and response after hearing the group response. With this in mind, focus groups were chosen because they are a more *active*

form of research whereby knowledge is documented in a manner similar to how it is generated in everyday life (Bryman & Teevan, 2005: 195).

Individuals who partook in focus group discussions were selected because they were directly involved in educational and interpretive activities in the Mountain National Parks. In general, focus group participants tended to have more hands-on experience with interpretation, education, and guiding in the Icefields Parkway region relative to the interviewees. Participant invited to each focus group discussion were purposefully diverse and included members from most of the same stakeholder categories identified for key informant interviews. They included Parks Canada interpreters, Parks Canada communications employees, Parks Canada district wardens, independent tour guides, independent hiking guides and interpreters, and members of non-profit educational and/or community organizations. All participants demonstrated a familiarity with the Icefields Parkway region either by virtue of having worked there for a minimum of five years in the past, or because they were currently engaged in work that utilizes the area. A sample focus group looked something like this:⁵

- *Cathy*: Conservation biologist, public speaker and hiking guide working in the Banff area for the last 17 years;
- *Shannon*: Parks Canada interpretation programming, working in various interpretative positions for the last 8 years;
- *Trevor*: assistant manager of operations for one of the largest tour companies in the region, first started working as an interpretive bus driver up in the Icefields Parkway 15 years ago;
- *Mike*: environmental education programmer, accredited by the Association of Canadian Mountain Guides (ACMG), currently working with youth visitors;
- *Natasha*: accredited professional interpreter and hiking/ski guide working in the area for the last 16 years;
- *Paul*: accredited ACMG guide, environmental educator, public lecturer, and director of successful guiding outfit with operations along the Icefields Parkway, working in the Mountain National Parks for last 10 years; and,
- *Sarah*: Parks Canada communications employee, previously involved in interpretive programming and outreach education, residing in and employed by the Mountain National Parks for last 10 years.

⁵ For the purposes of protecting anonymity, the exact names, job titles and group compilation have not been divulged.

The participant descriptions above demonstrate the relatively high levels of experience, wisdom, and personal commitment embodied by participants in helping to guide, shape and facilitate educational visitor experiences. It was hoped that through the focus group method, the above mentioned participants would be afforded the opportunity to generate a vision of what it would be like to deliver education that honoured the social values of ecological integrity in protected areas such as the Icefields Parkway. The vision of education for ecological integrity along the Icefields Parkway, would be implemented by the research participants themselves.

Focus groups were kept relatively small (under 7 people) to ensure depth in participant response. In dealing with more complex issues where participants are likely to have a lot to say, Richard Kreuger and Mary Anne Casey (ibid) recommend a group size of six to eight participants. In two situations, seven focus group participants were successfully recruited. However, in the third group, despite having had eight participants confirm their availability, only three individuals actually participated. Although three people may not seem ideal for a dynamic discussion, a lively and engaging discussion ensued. Not surprisingly, the level of detail participants shared in this discussion surpassed that of other focus groups, and led to thoughtful and insightful responses to research questions.

In preparation for these three focus groups, two pilot discussions were held to test focus group design, group facilitation skills and the wording of research questions. The first of these pilot groups occurred in January 2007 and was a key step in directing this research study. The second pilot discussion took place one week prior to the first formal focus group at the end of August 2007. In attendance at this pilot discussion were five Parks Canada social science employees who provided valuable feedback on the wording and number of questions, the recording of focus group data, and feedback on personal facilitation skills.

All three formal focus groups followed the same general format and discussion process. A copy of the focus group questionnaire guide is found in Appendix B. Focus groups were designed to have two distinct phases. The first phase targeted participants perspectives on the social construction of ecological integrity and generated data towards making an overall philosophical contribution to understanding the role these ideas play in

the context of the Mountain National Parks. In preparation for this, participants were asked to arrive at focus group discussions having already thought about what the concept of ecological integrity meant to them personally. These instructions were included in a follow-up recruitment email (see Appendix C.)

Each group began with a brief welcome, overview and explanation of ground rules to facilitate a positive discussion. A round of introductions followed as everyone in the room was asked to share their names, what role they had in the communication of park values to visitors, and what it was they most enjoyed about their work. Participants were then given ten minutes to further contemplate their concept of ecological integrity and create a visual representation using paper and various drawing and colouring utensils. The resulting drawings were then used as a method of sharing individual thoughts, reactions, beliefs and feelings on the subject. In all three instances, these discussions lasted about an hour and were lively, engaged and inclusive of all participants sitting around the table.

After a short break, focus group discussions resumed and the second phase of discussion questions was introduced. Questions asked at this time were more practical in nature as they aimed to draw out tangible educational efforts that would reflect the values of ecological integrity as discussed in the first phase of the group. It was during this section of the focus group that most research questions were asked. Many of these questions followed-up on comments previously made by study participants, as well as introducing questions that had not yet been addressed. This second phase of discussion generally lasted an additional hour. In all three focus groups, discussions were called to an end after two and half hours, at which time individuals who had to leave did so, and those who wished to stay and build upon the information that had been generated were encouraged to stay.

Not all of the same research questions were posed, or posed in the exact same order, from one focus group to another. In some situations this was because the nature of the discussion at hand had already covered a particular topic of inquiry and it would not have made sense to ask the originally intended follow-up question. Similarly, in order to build upon the discussion taking place at that moment, question(s) exploring the subject

matter were chosen as follow-up questions, rather than sticking to a rigid questionnaire guide.

After the signing of consent forms, discussions were audio-recorded, video-recorded, and kept track of with detailed hand-written notes. Research assistants were hired to assist with the recording of all focus groups. All research assistants signed a confidentiality agreement. To assist with group facilitation, notes were taken on a large piece of chart paper visible to participants, aiming to capture different viewpoints and complexities in the thoughts and opinions tabled. Participants were then able to point out when I had misrepresented what they meant to say, as well as refer back to points that were raised earlier with greater ease. Chart paper notes were no longer taken when discussions slowed to more practical or less philosophically complex matters. All focus group recordings were brought to an end by the three-hour mark and any personal discussions that continued after this time were not considered as part of the study data. Focus groups were held in quiet but comfortable locations to ensure quality recording, and aid in the overall atmosphere of the discussion. Generous quantities of snack foods and beverages were provided, and participants were thanked for their time at the end of each discussion with two small gifts.

3.9 Thematic data analysis

A thematic analysis is defined as a search for themes that emerge as important to the description of the phenomenon under study (Daley, Kellehear & Gliksman 1997). Building upon a thematic analysis of a preliminary literature review and the findings obtained from a pilot focus group held in January 2007, potential codes were identified and organized into a preliminary code tree. A copy of the original coding tree is found in Appendix D. The coding tree identified relevant concepts and potential themes and organized them into like-categories.

It was helpful to develop the coding tree prior to entering the field for several reasons. First, the process of developing a coding tree in advance helped identify and organize thoughts and preconceptions, listing possible outcomes prior to actually entering the field. In addition, having a preliminary code sheet provided a tangible framework to

work with and build upon. Any data collected was immediately coded, or at minimum, compared to a predetermined set of concepts so that new codes could be developed as necessary. Although this coding tree was created at the outset, it was flexible and therefore subject to substantial change. It evolved as the data collection phase progressed.

All audio recordings were transcribed in full and the act of transcription was itself a process of analysis. Personally transcribing all of the research material allowed for a more detailed analysis of the data by virtue of an intimate exposure to it. During transcription, annotations recording emerging ideas, preliminary connections and significant themes were kept. Video-recordings were only referenced to help verify participant identities, seating arrangements, certain statements that were specific to hand-gestures, and other significant body language.

Once transcripts were completed, an expanded version of the original coding tree was developed through thematic analysis. This involved “careful reading and rereading of the data” (Rice & Ezzy 1999: 258). Codes and corresponding code themes were edited until they were clear and concise, reducing ambiguity caused by over-lapping codes. At this point, irrelevant codes were deleted and additional codes were created until the resulting code tree covered all major issues embedded in study data. Once satisfied with the final codes, all codes bearing a close relationship with this study’s guiding research questions were written onto individual pieces of paper. These codes were then physically arranged and rearranged into like-piles with the aim of identifying larger umbrella themes. These larger study themes were then discussed with the thesis committee to ensure that the themes were applicable, and exhaustive of the major sentiments expressed within the transcripts. After some juggling in response to external feedback, these categories eventually gave rise to the major themes discussed in the research findings of this study. An example of one thematized code tree is found in Appendix E. These broad-themes were colour coded. Transcripts were then thematized through the use of coloured tabs to assist in easier navigation of study transcripts.

With regards to field notes recorded during participatory site visits, a total of three notebooks documenting general observations, casual conversations, and contact information for potential interview and focus group participants were completed. Once fieldwork had been concluded, the notes were read carefully and all significant

information was recorded in an electronic document. These notes were not formally coded; rather, they were used as background and contextual information which supplemented the formal interview and focus group data.

3.10 Demonstrating rigour in research approach

Within a social phenomenology framework, it is of utmost importance that social research be grounded in the subjective meaning of human action (Bryman & Teevan 2005). With this goal in mind, this research aimed to gain access to participants' common-sense thinking, therefore aiming "to interpret their actions and social world from their point of view" (Bryman & Teevan 2005: 11). In an effort to ensure that study results remain grounded in the subjective meaning of human experience, three essential postulates associated with a social phenomenology research were observed: the postulate of logical consistency, the postulate of subjective interpretation, and the postulate of adequacy (Fereday & Muir-Cochrane 2006). A summary of these postulates and how they were met in this research is provided in Table 2.

Table 2. Postulates of social phenomenology and the criteria met

1. Postulate of Logical Consistency

Criteria (from Fereday & Muir-Cochrane 2006: 2-3)	Examples of criteria met
<ul style="list-style-type: none"> • "The researcher must establish the highest degree of clarity of the conceptual framework and method applied, and these must follow the principles of formal logic." 	<ul style="list-style-type: none"> • This study was carefully designed so that methods and modes of analysis suited the study phenomena and context. The conceptual framework and associated research methods and modes of analysis are presented transparently in this chapter. • Close consultation with the thesis committee in the developmental and fieldwork phases of this research helped ensure that the research methods carried out were appropriate to the research problem.

Table 2. Postulates of social phenomenology and the criteria met (con't)

2. Postulate of Subjective Interpretation

<ul style="list-style-type: none"> • “The model must be grounded in the subjective meaning the action had for the ‘actor’.” • Efforts should be made to ensure that participant responses were interpreted within the context in which they were speaking.” 	<ul style="list-style-type: none"> • The recording methods and mode of analysis preserved participants’ subjective words and point of view while describing the context in which participant responses were gathered. • Interpretive rigour was strengthened by presenting study findings alongside participants’ reflections in their words, thereby remaining transparent in the interpretation of study data. • Efforts to interpret participant responses within their current context may be seen in the prioritization given to conducting a series of informal interviews and participant observations so as to gain a better understanding of the field study area prior to conducting and analyzing more formalized interviews and focus groups.
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3. Postulate of Adequacy

<ul style="list-style-type: none"> • “There must be consistency between the researchers constructs and typifications in common-sense experience. The model must be recognizable and understood by the ‘actors’ within everyday life.” 	<ul style="list-style-type: none"> • By repeating prevalent topics of conversation and possible themes emerging from interviews and focus groups back to participants, interpretations and typifications made by the researcher were cross-checked with participants. Participants were allowed the opportunity to either affirm or, disagree that there responses had been interpreted appropriately, and set right these interpretations when necessary. • Study findings have been written up in a way that they are recognizable and easily understood by “actors” since the goal of this study is that findings be useful to these individuals.
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3.11 Study location: the Icefields Parkway

The Icefields Parkway is located in Alberta and housed by Banff and Jasper national parks. This highway, running between Lake Louise and Jasper, spans 230km, and is recognized internationally for “unparalleled” views of glaciers, mountain lakes, waterfalls, mountain peaks, alpine meadows, and wildlife. At the center of the Parkway lies the Columbia Icefield, the hydrological apex of North America. From start to finish, the Parkway follows the heavily glaciated spine of the Rocky Mountains, known as the Great Divide, and is the headwater sources for the Bow, Mistaya, North Saskatchewan, and Athabasca Rivers. These waters flow eventually into three of the world’s oceans.

The Icefields Parkway comprises one of the jewels of the Canadian Rockies World Heritage site. This “region has been identified by the United Nations as being important to all of humanity by virtue of its importance to planetary and ecosystem health” (Sandford 2007: 171), yet it is thought that too few people recognize the value of these places (*ibid*). On its own, the Icefields Parkway is recognized for its natural beauty and outstanding examples of geological and landform processes. The Parkway brings people to the heart of this site and is one of few places where people can easily access glaciers and icefields to see glacial processes in action.

Visitors are attracted to the Icefields Parkway region to engage in a wide diversity of activities ranging from driving and sightseeing to mountaineering and fishing. According to a survey completed in 2003, the top five most commonly reported activities in the Icefields Parkway include (in order of popularity): sightseeing (includes driving and seeking out specific landmarks), hiking, viewing wildlife, walking, and interpretation (PCA 2003). That the Icefields Parkway region is characterized as a location where visitors come in search of the above-mentioned activities before anything else sets this area apart from other areas in the Mountain National Parks. In one example, the top five

activities reported by visitors to the Banff region include (in order of popularity): driving (includes sightseeing), eating in a restaurant, shopping, seeking out specific landmarks, and finally, hiking (PCA 2008a). Based on these survey results, the Icefields Parkway region is particularly well suited for this study in light of the greater emphasis placed on activities that directly involve people interacting with nature, and the expressed interest in interpretation.

The chance to glimpse wildlife such as big horn sheep, grizzly bear, or caribou, as well as a broad range of recreational and educational opportunities, drew as many as 1.6 million visitors to the Icefields Parkway region in 2003 (PCA 2003). While international visitation to the Parkway has decreased, visits from Albertans and other Canadians have increased and this trend is projected to continue (PCA 2003). Significantly, this has meant that while single-visitation rates have decreased, the number of repeat-visitors from Alberta's growing population is on the rise (PCA 2007c). In considering park education, this result is particularly interesting since it would seem that multiple educational experiences per visitor would be possible.

From a biophysical standpoint, a summary of the major characteristics of, and issues concerning, ecological integrity of the area are summarized and provided in Appendix F.

A recent commitment on the part of Parks Canada was made to devote time, energy and resources towards the development of a renewed management plan for the Icefields Parkway. Although more than 400,000 vehicles that travel through the Icefields Parkway every year (PCA 2003), this area has received little attention from Parks Canada since the highway was redeveloped in 1961 (Rettie 2006a). The Parkway's road surface, pull-out facilities, campgrounds, interpretive media, etc., have become seriously degraded over the past ten years, while issues of commercial growth and human wildlife-conflict in the communities and surrounding areas of Banff, Jasper and Lake Louise have dominated park management activities. However, Parks Canada has recently recognized that "[it] is now time to turn our attention to the Icefields Parkway and develop a clear overall vision and concept for managing the Parkway that addresses each aspect of Parks Canada's mandate in an integrated manner and outlines the roles Parks Canada and the tourism industry should play in its implementation" (PCA 2007c: 4). This region makes for an

ideal case study, since the results of this study have the potential to influence future management actions.

In general, much of the educational infrastructure provided by Parks Canada along the Parkway (including interpretive media and self-guided trails) are 20 to 30 years old, out-dated, and worn-down. As it stands, learning activities taking place along the Icefields Parkway are delivered in part by Parks Canada, such as exhibits and signage at viewpoints and major day-use areas such as Bow Summit, as well as some interpretation provided at Saskatchewan Crossing. However, privately managed partner organizations and independent guides and interpreters provide the majority of learning activities in the area through exhibits at the Columbia Icefield Centre, interpretation on board numerous commercial tours, at lodges such as Num Ti Jah, and by nature/hike/mountain guides hired to take visitors out into the surrounding environment. Consequently, little is known about what educational messages are being communicated, the impact of these educational opportunities, and whether the opportunities offered are aligned with park mandates and objectives. Furthermore, there appears to be little coordination of learning opportunities, including the identification of themes and messages, between the two managing parks (Banff and Jasper), and between the parks and private partnership organizations delivering the bulk of educational opportunities in the region.

For a number of reasons, the Icefields Parkway is itself an interesting and appropriately representative location to explore the idea of ecological integrity as it is understood by senior communications, educational and interpretive personnel. First, the Parkway is part of the two largest and most influential parks comprising the Mountain National Parks group. In addition, the majority of study participants tend to split their working time between the Parkway and their jobs closer to home (in places such as Banff, Field, Lake Louise, Jasper, etc.). As such, while the Parkway is a unique and special place, the ways in which participants personally comprehend and publicly interpret ecological integrity in the area are likely typical of the Mountain National Parks as a whole.

Second, the main thrust of theoretical inquiry guiding this study supports the early expressed intentions on the part of the Icefields Parkway Planning Initiative. The Icefields Parkway planning process aims to “address each aspect of the Parks Canada

mandate in an integrated manner [whereby] ... each component of Parks Canada's mandate is advanced in a mutually supportive manner" (PCA 2009a: 2). Although support for an integrated approach to Parks Canada's three-pronged mandate is broadly stated in early planning documents, questions remain as to how the values associated with the ecological integrity mandate are, or should be, integrated into educational and visitor experience management goals. This study directly addresses these questions.

3.12 Limitations of study design

Limitations occur for all studies, and as a master's thesis, the data coded and themes identified were done by one person in consultation with a research committee, and the analysis then discussed with a supervisor. This process allowed for consistency in the method, but failed to provide multiple perspectives from a variety of people with differing expertise. In addition, it is commonly accepted that qualitative research is not generalizable since the context in which social phenomena is studied is inevitably unique (Silverman 2005). Although the knowledge gained from one specific context is subjective and dependent on a number of context-specific variables, this is not to say that understanding one context cannot provide insight into other contexts, given that the unique and subjective nature of each location or phenomena is acknowledged (*ibid*).

Although this research aimed to represent a diversity of stakeholder groups, the majority of participants in this study were variously supportive (but supportive none the less) of the Parks Canada Agency's ecological integrity mandate. The participants selected for this study were "professionals" in the fields of education, interpretation and communications who were particularly knowledgeable about ecological integrity education by virtue of their many years spent engaged in related activities. However, much of the interpretation that takes place in the Icefields Parkway region is disseminated by seasonal interpreters, mostly in the private sphere, some of whom may not be interested in, or perhaps do not support, and do not have the personal knowledge and expertise about communicating ecological integrity. As such, there was a selection bias for seasoned professional educators and managers, which limits the applicability of study findings. However, since the goal of this study was to assess changing ideas of ecological

integrity and park education, it did not make sense to engage individuals with limited interest or knowledge in interviews and focus groups.

3.13 Personal research statement

I have worked for Parks Canada in the past for three summer seasons as a member of Banff National Park's trail crew. In this time I had the opportunity to meet and network with numerous Parks Canada employees from various fields of work. I also have numerous friends and family members who live and work within the Mountain National Parks. After having grown up near this area, I was already personally acquainted with the landscape and some of the people with whom I engaged in interviews and focus group discussions. This presented significant opportunity for me as I was granted the time to speak with numerous individuals who were incredibly busy and might otherwise not have made time for this research. In short, my personal contacts and familiarity with the area helped me to navigate through my field season with relative ease, providing the opportunity to speak with many of the most highly regarded, well versed, and experienced individuals in their field. On a more formal level, my prior relationship with one of the Mountain Park social scientists resulted in my research being officially approved, partially funded, and advertised within the Parks Canada Agency. As a result, I was granted access to meetings, upper-level managers, library resources and internal emails that other independent researchers may not have had access to.

Although being so familiar with the social context in which I was studying had its tremendous benefits such as increased access to people and information, there are disadvantages that go along with these sorts of relationships. I am aware that my close affiliation with the Parks Canada Agency, and my personal connection to the people who are working hard to do their jobs within a given environment, can make it difficult to be critical. Being so close to the context in which I was studying, there is often an implicit

pressure to avoid controversial topics, especially when future employment may be sought with the Agency in question.

With this in mind, measures were taken to ensure that I remained aware of these outside influences such as journaling about the issue, consulting with my thesis committee about any possible issues or tensions, remaining transparent in my interactions with other people about who I was, and the role I currently occupied (as a student, and *past* park employee). Furthermore, when seeking participants for interviews and focus groups I was sure to position myself as an “independent researcher” who had the financial support of the parks. In all my dealings with the stakeholders of this study I strove to remain as open and non-judging to their thoughts and opinions as possible and found that I learned a lot in the process.

My previous personal knowledge of and curiosity about the key concepts in this thesis (ecological integrity, environmental education, and interpretation) have likely been informed by past experiences working as an experiential educator in an outdoor setting, as a hiking and adventure guide, as a close friend to many wildlife biologists, and from a deep personal love for the outdoors. While I understand that these personal experiences produce certain biases in my engagement with this research project, I aimed to identify these biases in an effort to deal objectively with them.

Finally, fueled by my personal experiences exploring and recreating in the case study area, I am enthusiastic about producing a body of knowledge that has the potential to benefit the natural environment and the people who share their lives with this glorious place.

CHAPTER 4 STUDY FINDINGS

The findings described in this chapter address the social values associated with ecological integrity as described by interview and focus group participants. Six sections addressing individual themes identified by participants with respect to the principles of ecological integrity are identified. Finally, the most frequently described barriers to interpreting ecological integrity within the Icefields Parkway region are presented.

4.1 Ecological integrity as a social value

Ecological integrity is defined within both a scientific framework and a social value system. The biophysical principles associated with Parks Canada's operational definition of ecological integrity are explicit, and include: biological persistence; diversity of native species; diversity of abiotic components of the ecosystem; rates of change; and supporting natural processes. This research suggests that the majority of participants possessed a least a minimum general knowledge of these biophysical concepts, and their relevance to the Mountain National Parks. The following focus group excerpts exemplify participants' understanding of biophysical concepts.

Daniel:

Ecological Integrity, to me, means that you've got a place where all the things that are native to the area are there, including the biotic, abiotic and the processes...and including the people. And they are able to interact with one another in a way that is ultimately sustainable. So, there is change involved in that, but there are changes within certain boundaries. It's a flexible and dynamic system and if you have it in place then you have a healthy culture and a healthy environment. (interview)

Cameron:

Well, EI has to do with maintaining populations and species in their natural patterns of abundance...It's about all that stuff we learn in biology like connectivity, biotic connections, natural processes, and so on. But, it's tricky, 'cause, what are we calling natural? ... Where do you stop and start defining these things? I really like the idea of defining EI in a way that addresses how humans and nature can co-exist. (interview)

These excerpts help to exemplify the biophysical relationships generally assumed to comprise the concept of ecological integrity. They are typical of the thoughts and opinions of most study participants no matter their professional background.

Understanding the details of such relationships was upheld as one of the primary ways of investigating the relative ecological integrity of places such as the Icefields Parkway.

However, within open-ended interviews and focus groups, when participants were asked to describe ecological integrity, they rarely stuck to descriptions that were of solely of a biophysical nature. In fact, the intricacies of these principles biophysical principles were rarely described in any more detail than the examples above illustrate. Rather, participants took the opportunity to direct conversations about education for ecological integrity towards a more critical social analysis of the concept, thus honing in on the sociocultural values they saw imbued within the concept. Following a biophysical description of ecological integrity, Daniel's reference to having a "healthy culture" provides one such example. Cameron's reference to defining ecological integrity in relation to how "humans and nature can co-exist" provides another. In discussing the concept of ecological integrity, participants almost always turned to issues that were moralistic, political, emotional, or otherwise highly value-based. Sarah referred to ecological integrity this way:

To me, a key fundamental part of all this is being appreciated. So, that's the other human component of special places happening: it's being appreciated, and your appreciating that just helps to support the other things that I think are a part of ecological integrity. This is where you get stewardship, and this is why we talk about ecological integrity here at Parks Canada, isn't it? (FG1)

Here, Sarah identifies that, in addition to the importance of all the biological parts and processes that characterize ecological integrity (which she listed off earlier in conversation), the *personal act* of appreciating such places and thereby acting in accordance to those values through stewardship activities, were fundamental parts of understanding and valuing ecological integrity. Mike and Phillip, two professional guides and environmental educators, shared these perspectives:

Mike:

Well, one thing not to overlook is that 'ecological integrity' is a concept that people are inventing to some degree. And, it's for people. It's not necessarily the environment alone. It's describing to us how we should treat the environment.

Phillip:

Defining ecological integrity, in a sense, is a backwards way of defining the human role in the ecosystem. ... By defining what the ecosystem is, you are therefore trying to define our role in it – the thing that we are talking about at this table here is just that. We're talking about how our values affect how we want to have a role in the ecosystem. Unfortunately, when we interpret ecological integrity to the public, a lot of the time we don't approach it from that angle, instead we talk about it in terms of scientific facts. (FG3)

Ecological integrity as a reflection of how people have come to understand and value the natural environment is a theme throughout *all* the major findings of this study. From this point of view, ecological integrity is seen as a decision-making framework to help people understand ecosystem connections in greater detail and assess people's relative roles within those systems. Participants expressed a need to apply a value-based rationale to the protection of ecological integrity. In the following focus group excerpt, Phillip provides some additional insight into how education that deals more explicitly with the social values of ecological integrity might differ from current approaches:

Phillip:

If we just look at the Parks Canada definition of ecological integrity and compare it to how we've been talking about it, we've definitely covered most of the [biological] basics... But, if ecological integrity is spiritual, or if it is an actual worldview - and from what I can tell, it sounds like it is to most of the people here - then you have to try to make a spiritual ecological integrity connection too. The same thing applies when we said that the whole notion of ecological integrity has come out of us trying to understand our role in the ecosystem. That should all be a part of our educational approach – I'm not sure that Parks Canada takes it that far. In fact, I know they don't. (FG3)

Participants identified that there was more to communicating ecological integrity than just sharing scientific knowledge about past and future human impacts on the natural environment. While study participants acknowledged that understanding the complexity of ecosystem relationships was of utmost importance, participants also demonstrated an awareness of the danger posed by focusing “*too narrowly on scientific facts*” (Dean,

interview). At the root of these concerns was the opinion that educational experiences that portray issues of ecological integrity in solely biological and value-free terms would fail to encourage individuals to think critically about their personal connections to the natural environment. Interpretation of this kind therefore fails to get visitors thinking critically about their own worldviews, their sociopolitical environment, and their daily activities that inevitably affect, and are affected by, the ecological integrity of places like the Icefields Parkway.

The next six sections build on participants' sentiments that ecological integrity is a reflection of how people have come to understand and value the natural environment. Six major themes were identified and account for the most prominent emerging messages about the principles of ecological integrity: Ecological integrity as *health & wholeness*; as a sense of *place*; as *transboundary* in character; as a way of conceptualizing the *role of people in nature*; as the principle of continuous *change*; and finally, as the principle of *connectedness*. Although each theme refers to an individual principle, the boundaries between each theme are not well defined as demonstrated in the significant overlap in their meanings and functions. Within each of the study themes, the ways in which these principles contribute to definitions of ecological integrity are presented first. This is followed by a description of how the principles affect the communication of ecological integrity messages to visitors.

4.2 Ecological integrity as health and wholeness

In all focus groups and interviews, educators were asked the following question: "If you came across a place characteristic of ecological integrity, what do think it would look like?" While the responses to this question were diverse in their details, in a general sense, they almost always highlighted the notions of "health" and/or of "wholeness." Excerpts taken from discussions with Jane and Daniel introduce this theme well.

Jane:

Well, I guess when I hear "ecological integrity" I instantly think about how we have the Parks Canada mandate and the Parks Canada Act and that is: on behalf of us, as Canadians, to protect these places for future generations, for our youth

and their future generations. So, to me it's all about protecting healthy places, to sustain them healthily. ... To me, if I'm thinking about ecological integrity, I know you have to take the whole picture into consideration. ... (FG2)

Daniel:

Ecological integrity, to me, means that you've got a place that is healthy. It's where all the things that are native to the area are there - it's whole. ... and every thing interacts with everything else in a way that is sustainable. ... It's a flexible and dynamic system and if you have it in place then you have a healthy culture and a healthy environment. ... So, ecological integrity is that healthy state, it's that whole picture. (interview)

For many participants, the notion of health and wholeness captured the essence of ecological integrity. These concepts, were often used interchangeably in participant discussions, and were prized for being wide-ranging in application and scope. The notions of health and wholeness applied to the concept of ecological integrity appeared to revolve around four main issues.

First, participants used the terms health and wholeness in a biophysical sense by placing emphasis on the importance of having all the parts (native plants, animals, geological features, etc.) and processes (hydrological cycle, predation, fire, floods, etc.) present and robust. This point of view may be seen in Daniel's reference to his idea of ecological integrity being one of a place that is *healthy* because it is a *whole* system with regards to its physical components, and biological processes. Building on these ideas, the following excerpt suggests a strong link between good health and high ecological integrity.

... in my point of view, ecological integrity runs in the gamut from really having a lot of integrity to not having very much at all. So, there is a whole range there, and that sense of wholeness gets bigger ... and stronger ... as more of the parts and more of the processes of nature are allowed full sway ... in the landscape. ... (Natasha, FG2)

Natasha was not alone in her view that the concept of ecological integrity was capable of capturing a whole spectrum of ecosystem states ranging in their relative biophysical health and wholeness, and therefore determining the amount of integrity a place may have.

Cathy introduces a second interpretation common amongst study participants whereby issues of human health and wholeness were linked with the concept of ecological integrity :

[T]o me, ecological integrity is still about learning and understanding all the unique needs and connections of all living things including things like ants and worms and nematodes, and all the other parts and processes that come together to make a place whole – if they are all there, then you probably have ecological integrity. ... But, also, in all this discussion around ecological integrity, isn't there that question of 'when do we start to suffer from the bad effects of all this activity as a species in terms of our own health?' To me, what we want to do to maintain ecological integrity is to keep things tipped in the direction of preserving health, our health, the whole system's health. ... (FG3)

Participants felt that the biophysical health of the environment (a key indicator of ecological integrity) contributed to the physical health of people. Participants consistently expressed the view that ecological integrity was, ideally, a wholistic concept that necessarily took both the human and the ecological perspectives into account.

Hanna brings to light the third interpretation of health and wholeness by highlighting what another participant identified as the need to “*think in terms of the whole*” (Cameron, interview).

To me, ecological integrity is also a feeling of wholeness ... you've got to get away from linear thinking..., away from departmentalized thinking. You've got to think more in terms of the whole, rather than the parts. So health, to me, talks about the parts and the health of the individual parts...but if we're talking about ecological integrity, then we have to bring it all together and think in terms of the health of the whole ... so ecological integrity is about changing the way we think to see health as a more holistic thing ... absolutely everything counts. (interview)

Interestingly, it appeared that educators saw that the notion of wholeness in human thought and perception was essential to understanding health in relation to ecological integrity. Evidence of this perspective was found in numerous participant anecdotes detailing the importance of recognizing the ways in which individual parts and processes came together, and formed complex and widely connected systems.

Finally, building on an expanded intellectual understanding of ecological integrity, participants also indicated an emotional element to their association of health and wholeness with ecological integrity. Natasha provides one such example:

Parts and processes are more important to me to the idea of wholeness in that when you're inside of nature – and this is what my picture is trying to convey – there is this wonderful sense that is so rare, and so special. ...This experience that you have just from walking in on a simple trail in these parks is such an incredible luxury in this world. There is this feeling of wholeness that surrounds you that I feel is a precious, precious commodity. I feel incredibly lucky to have it in my life on a regular basis. I feel very happy about that and I feel fulfilled. To me, that overwhelming feeling of wholeness is ecological integrity. (FG2)

For Natasha, and others, not only was it important to *think* in terms of the whole, but it was also possible to *feel* the sense of wholeness associated with places characteristic of ecological integrity. Places characteristic of ecological integrity were described as being capable of bringing about feelings of wholeness. This is significant for environmental educators since places that were described as being whole were also respected for being incredibly “precious”, comforting and awe-inspiring.

In summary, participants’ association of the terms health and wholeness took on a combination of biophysical and socio-cultural characteristics. Notions of health and wholeness demonstrated four major characteristics with regards to ecological integrity: the presence of all native parts and processes within a given ecosystem; the biophysical health of ecosystems and the relationship between human and ecosystem health; wholeness in human thinking; and emotional feelings of wholeness inspired by places of ecological integrity.

4.2.1 Using “health” as a metaphor for communicating ecological integrity

Educators describe a tendency to replace the phrase ecological integrity with ecosystem health when communicating with the public. After having established participants’ personal interpretations of ecological integrity, participants were asked which words they chose to illustrate this concept to the public. Interestingly, in all but one case, participants specified that they rarely used the words “ecological integrity” in

initial interactions with park visitors. An excerpt from Daniel' interview provides one such example: “‘[E]cological integrity’ just sounds like googly-guck to most people. ... Things like ‘it’s healthier this way’ are a lot easier to understand (interview).” Similarly, Angie, accurately summarized a lengthy focus group conversation this way: “It sounds like we don’t really use it intentionally, but if it comes up we talk about it, of course. I mean, we’re always talking about it, but we’re using different words that just easily make more sense to people” (FG1).

The following quotation from Daniel helps to explain why he prefers the vocabulary of ecological health.

Ecosystem health, animal health, the health of the park; I use all those terms when I’m talking about ecological integrity ... People can relate to this because it is a human term we use as well. They understand that when they’re healthy, they feel a certain way, and when they are unhealthy, they don’t feel that way. So, when you are talking about whether an ecosystem is healthy, they at least have something in their own memory they can relate to and say, okay, well, unhealthy means crap, right.... So, you can use that as a metaphor that’ll carry over into the rest of the conversation. Based on what I see in the field, I think a lot of us do this. (interview)

Similarly, Brian, provided this explanation of the educational value behind using a term like health to explain ecological integrity to park visitors.

If I’m talking to visitors about ecological integrity... talking about health is great. ...you can look at the physical health of different species, [and] you can look at the health of the landscape too. Like, is it all scarred up? Are there mines? If so, it’s been injured. It’s not healthy in the same way that it once was. I think health is an excellent metaphor to use. ...Health is integral, it’s a piece of that whole and it’s easy to wrap your head around... (interview)

Here, Brian discusses the relationship between the notion of health and wholeness, and identifies health as the primary metaphor used when interacting with park visitors. This situation was consistent with other participant field observations.

In the following excerpt, Natasha shares some of her insight with focus group participants over what she sees as a strong reliance on the concept of ecosystem health to describe ecological integrity.

.... I would say that it's probably really, really important that, over the course of all the exhibits, you have talked about the whole picture, not just some of the parts, like we often do. But it's tricky, because people just stop and they only see or hear that one little piece, then they just hear that things are healthy, or not healthy, and it's too simple. Somehow you have to get people to ... connect ... each place with the last place – it would be an incredible experience if you could do that. But all that takes a lot of time, to really get that feeling of wholeness – that's why it's easier for us to talk about health. ... (FG2)

Participants felt that interpretive efforts sometimes focus too narrowly on individual examples of ecosystem health at the detriment of the broader idea of whole system health. For Natasha and others, focusing almost exclusively on individual components risked losing the sense of wholeness that was deemed to be so significant to the idea of ecological integrity on both intellectual and emotional levels. Interestingly, although most participants addressed the idea of wholeness in their personal reflections of ecological integrity, only four individuals reported actually talking to visitors about wholeness.

4.3 Ecological integrity and a sense of place

In almost all situations where educators spoke of supporting and protecting ecological integrity in Mountain National Parks, they also spoke passionately about personal experiences in very specific and local environments. In one example, Sarah explained to focus group participants what ecological integrity meant to her by describing her special place in Jasper National Park.

When I was thinking about ecological integrity, I was thinking about this place of Glacier Lake... I would take my little backpack, a couple wine glasses... And then, all around me there would be these beautiful mountains. ...I would bring my paints out there, and one of the wine glasses would have water in it and I could dip my paintbrushes in that, and then the other one would have wine in it. And that was my place. ...I really liked it. ...So, there's just that whole integrity of the place that [comes with] the integrity of the experience you get just from being there. And there's internalizing that experience so that it becomes a memorable one that you can hold with you over many years. (FG1)

Sarah's story demonstrates ecological integrity as a sense of place. For this key principle a participant's understanding and appreciation of the ecological integrity concept was born out of personal experiences linked to specific natural places. Natasha provides one more example:

This experience that you have just from walking in on a simple trail in these parks is such an incredible luxury in this world. There is this feeling of wholeness that surrounds you that I feel is a precious, precious commodity. I feel incredibly lucky to have it in my life on a regular basis. ...but to completely sense the wholeness that is there, takes years of exposure... to actually sense the ecological integrity (FG2).

In the following excerpt John is explicit about the need for these sorts of experiences and their relative importance to the concept of ecological integrity.

To me, it's about ecological integrity being a sense of place, and kind of just appreciating where we are. ...this sense that this place might be quite different than somewhere else. But recognizing that in order to really love a place, or, love the whole picture – in order to have an appreciation for ecological integrity – we have to come to a place, we have to really experience a place, and we have to value that place. (interview)

Time and time again, participants demonstrated that their respect for ecological integrity developed primarily through experiences that helped them to gain a genuine *sense of place*. This is not to suggest that participants' views of ecological integrity were constrained to a singular location or state, but rather that from bonding with a particular place, their awareness, appreciation and support for the protection of ecological integrity grew. John later asserted that the focus group discussion in which he was involved retained its value as an exploratory exercise because of the "*intense and intimate personal experiences that we're fortunate to have on almost a daily basis here*" (FG1). Others in the group agreed and held up the importance of fostering a sense of place as one of the primary ways in which growing to respect the values of ecological integrity was born. Mike expressed his point of view this way:

In my mind, it's not just education that turned me on to the ideas that we're talking about here. ...Like, I knew all the numbers, I had heard all these facts a

hundred times, but it really wasn't until I experienced the Icefields myself that any of it made any sense to me. So to me, so much of it is about experience. ...You know, like I couldn't talk to the kids and be as passionate as I am unless I had those experiences that really caused me to respect these places. ...If I didn't have that I'd just be another thing spewing facts. (FG1)

Here, Mike vocalizes well the importance of personally engaging with place as a means of bringing information-rich knowledge to life. This personal connection to place was seen as of great importance in understanding and appreciating ecological integrity in many thoughts, stories and opinions of the study participants.

However, the circumstances in which a personal connection to place forms required further exploration. Participants were asked a follow-up question if just any natural place would do. The following section delves into participant feedback on the significance of a particular place, and the types of experiences that engender a sense of place.

4.3.1 A unique sense of place: biodiversity, native species and supporting processes

Evident in study findings was a conceptual link between the biophysical concepts commonly associated with ecological integrity, and the importance placed on experiences grounded in place. As mentioned in the health and wholeness section, participants' descriptions of natural spaces characteristic of ecological integrity made reference to essential biophysical concepts. Participants emphasized the importance of having all the "parts and processes" unique to an area present and functioning well. In the following description of Wilcox Pass, located near the Columbia Icefield, Tamara highlights this conceptual link.

... so I know that I just went on about that place forever, but that's what Wilcox Pass is like to me and I guess special places like this, you know, places that have ecological integrity, they have all the parts and processes that are supposed to be there. ...To me, part of getting to know all that was just spending time up there and discovering for myself what all these things are. (FG1)

Here, Tamara suggests a parallel between the biophysical concepts subsumed under the concept of ecological integrity (such as native species and natural processes

unique to an area), and first-hand experiences that lead to an appreciation for the parts and processes that make ecosystems with integrity unique. An additional excerpt from Sherry provides another supporting example.

Well, a place with ecological integrity would have all the parts and processes that are supposed to be in that specific spot... But you know, it's also more than that. You'd never even know the difference between a place with integrity and a place without unless you had a lot of information at your hands, or at least a lot of experience in these places to bring that information to life...otherwise, a park is just like any another park...and I don't think that you can get that same feeling of wholeness in just any urban green space that places with ecological integrity have... But even if you have all the information there is to have, for a lot of people, you still need the hands-on experience in those places to bring the information to life. (FG3)

Participant responses suggest that while experiences in nature are an incredibly important avenue of acquainting people with the concept of ecological integrity, the characteristics of the natural space are also important. As Shannon points out, one common perspective is that experiences in natural settings that do not exhibit high levels of integrity, such a city park missing much of native parts and processes, are not likely to yield an experience true to the concept of ecological integrity. From this perspective, experiences that get people in touch with ecological integrity need to be grounded in places that have all of the plants, animals, organisms, geology and supporting processes. Not surprisingly, in light of the unique and special nature of each ecosystem with integrity, intimate experiences in these places would be similarly unique. The implications of this for education in the Mountain National Parks are presented in the following section.

4.3.2 Education grounded in place

This section addresses the role of “ecological integrity as a sense of place” within an education framework. It summarizes the participant discussions specifically addressing how the notion of place, when imbedded within the definition of ecological integrity, influences educational efforts within the Mountain National Parks. Three major

findings are presented, all of which speak to the need for park education that is firmly grounded in place.

4.3.2.1 Let the mountains teach

When addressing the topic of education for ecological integrity, participants identified a need to facilitate experiences that were intimate, hands-on, and sense-surrounding in nature. Krista had this to say on the subject.

Just recently I had two weeks of travel up and down the Icefields Parkway with about 10 people in each group... I just wanted to bring people there so that they would simply be there to enjoy it.... It was never my intention to make it a 'global warming' tour... But, after we looked at the ice and saw the Icefields Parkway... everything kept coming back to global warming... It happened from being on the Icefield Parkway, from going on a walk, from some of the hikes that we did... that helped me to talk about the connections in this place – and it opened up a discussion... It just made it really real – on the landscape they could see changes because we spent some real quality time in there... and just being in the landscape long enough made them curious, and made them care in a way I could never have done on my own. (FG1)

Often visitors initiate the exploration of ecological integrity issues just because they are immersed in the mountains. Here, Krista explained well the power of this seemingly hands-off approach to interpretation and how it allowed for visitors to generate their own questions and curiosities about issues connected to ecological integrity simply by being immersed in the natural landscape. Similarly, Natasha, another professional guide spoke about the potential of allowing visitors to generate their own personal connections with the landscape by ensuring that they get out into it.

[Y]ou have to help them [visitors] overcome the glass window, you need to help them get more in touch with these amazing places. ...[O]nce they have had enough experiences of wholeness, or once they've had enough of those magical moments, like when they catch sight of something that excites their imagination or their feelings...maybe the smell of a meadow of wildflowers that transports them for a moment...then they will begin to understand because they want to... These things are powerful and make what we want to talk about actually hold meaning for people. (FG2)

In examples such as these, participants pointed out that it wasn't until people had the opportunity to personally connect with, and have experiences in places characteristic of ecological integrity that information began to resonate with the learner. With this in mind, John reflected on the relative role of the park educator:

[T]o me, this perception we have of many of us as the educators is, well, just not totally accurate. Often times it's really the mountain that is the educator...just like the mountain taught us. We just need to let the kids hang out on the rock... The thing is, we just don't let people do that very often. (FG1)

Through participants' emphasis on the benefits and importance of getting people immersed in the mountain environment, they assert that the mountains are themselves very powerful storytellers of place. The underlying assumption here is that if afforded the opportunity, people can, and often will, learn from intense experiences in the protected landscapes that make up the Mountain National Parks. Participants emphasized the importance of helping visitors to see “*past the post card view of these places*” (Hanna, interview), or beyond a “*glass window that do[es] little to help generate any semblance of what the landscape is really about*” (Phillip, FG3). The following anecdote from Natasha does an excellent job of capturing a multitude of participant comments surrounding this issue.

[I]f I was looking for ways to help them experience the national park and the ecological integrity up there, I would think about how many ways could I get them out of their car? Tempt them just that little bit further off the beaten path; spread them out so that they are not in a crowd... We're trying to get people to understand that this (she points out the window) is about more than just the beautiful scenery... to do that you need to offer an incredible experience to start so you can get people on board with that... Then it is just a little bit of education to get them geared up to appreciate that: “yeah: it is more than just the scenery.” And then I can say to them, “Look: we've got all our parts, we've got all our processes, it's still functioning, we're in really great shape here compared to other places in the world. We're really lucky.” But, here's the thing: to take a walk in solitude is a really great experience and it can do all this. But this kind of experience on the Icefields Parkway, at this point, is very car-oriented and the average visitor doesn't get much of that... You need experiences that are

somewhere between “I’m going to take a big long hike” and “I’m going to walk out to that busy viewpoint”... (FG2)

The sentiments here about the importance of getting people moving through the mountain landscape are echoed throughout the study results. Many educators criticized much of the current interpretive approaches in the area as being “*too car-oriented*” (Phillip, FG3). Contributing further to this discussion, a participant shared these thoughts in another focus group.

There just isn’t any room to roam in these really busy places where everyone pulls over to take a photo. And in the places where there is room to roam, like the picnic areas for example, well, there’s just not much there encouraging people to do so. It’s really poorly designed from this point of view. We could do a better job of that (Jane, FG2).

Concerns were raised over current interpretive approaches that do little to encourage visitors to stray very far off the highway. There are few opportunities for intimate, hands-on and unique experiences in the landscape where people gain their own sense of place while visiting the dramatic landscapes of the Icefields Parkway. Stephen, shared the following insight on this issue.

What we need to do is move away from experiences where people just come here to take their picture, to pick their flower, to bag the peak – you know, to conquer or...own a little piece of the park for themselves – that’s how a lot of people fulfill themselves here right now... We need to work on the nature of experience people have here so that it is one of interaction, exchange, and respect, so that what you take away is something more personal than that. And I don’t mean respect by not touching. I mean, get your hands dirty, feel the power of this place, and then you’ll respect it... Just taking a picture really isn’t enough... and right now, that’s pretty much all those pull-offs are good for up on that parkway. (interview).

While beauty and awe are indeed intrinsically important, participants suggested that generating a sense of place reflecting the principles of ecological integrity would require educational opportunities that escorted the visitor beyond picture-perfect views of the park and consumptive experiences of place. Opportunities held in high regard amongst participants were those that provided visitors with the chance *to move through*

the landscape - touching, smelling and sensing in as many ways as possible, so that the mountains might be afforded the opportunity to teach.

4.3.2.2 Solitude and connecting with place

Solitude figured prominently in study results as an essential component of providing experiences that fostered a genuine connection with place. In one focus group, Trevor (a park warden), helped to illustrate the role of solitude in fostering experiences grounded in place that help support a genuine appreciation of ecological integrity.

....The silence was so powerful that you could cut it. That's a strange phrase, and trite perhaps, but, just sitting on the side of a mountain... totally surrounded by the peaks and the glaciers. It was like the creation was there, but there wasn't a sound. There wasn't even a bird making a sound. And it just expands... you just feel yourself expanding into the experience. That is what solitude can do for you... But you're not going to get people to have that experience on the Icefields Parkway unless you are providing the avenue to that experience. Right now, they're all funneled into the same places. They're going to have to... get away from the crowds, even if it means...[having] to move that extra half-mile off the road on their own power. (FG2)

The importance of providing opportunities for solitude as a means of facilitating personal reflection came up in many ways. A comparison between the experience described by Trevor above, and the realities of the most frequented tourist attractions along the Icefields Parkway is significant here. Peyto Lake Viewpoint provides one such example. The Peyto Lake viewpoint has a small trail network, complete with a series of up-to-date interpretive signs indicating the flora and fauna of the area amongst other interesting ecological facts. It is regarded as a breathtaking location from which to view the turquoise colour typical of the glacial lakes in the region. For millions of people every year, this is one location where they manage to get out of the car, stretch their legs for a short walk to take in the sights, and, in one participant's words, "fight the crowds." In the summer months, Peyto Lake is bustling with activity. On a typical day, one hears languages from all over the world, the flashing of cameras, the stammer of shoes on the concrete pathway, the idling of tour buses, and perhaps, a comparatively empty sound

from the surrounding mountain environment. Although there are many factors at play, the key element of solitude is missing from the situation described here.

The balance between using educational field tools and providing opportunity for solitude was a point of contention throughout the study. As a means of communicating the values of ecological integrity, audio boxes powered by a manual hand crank – hence the name Crankies – were installed in various places throughout Banff National Park in the summer of 2007. The Crankies were a pilot initiative, exploring new interpretative tools, which inspired a fiery and illuminating debate. On numerous occasions private guides and interpreters expressed their frustration with these devices. Here is one such example from Phillip:

It's good that Parks is trying to be creative, but those things [Crankies] just ruin what last remaining bit of solitude there is to experience up there on the Parkway. When I take my clients up there I am trying to take them to places where they have the opportunity to stand in the midst of this incredible place and be hit by the profound silence of the place – you know, the kind of silence that isn't really silent, but at first, it strikes you like it is. So here I am with my group, it's early in the morning – I take people really early because at least then none of the buses and the other crowds have arrived yet and you get people to just be quiet and listen for the sounds of nature... Then, someone walks over to that stupid thing and cranks it and you hear this annoying mechanical voice start yabbering away... It totally ruined it! ... I've lost everyone and the person cranking it didn't even crank it till the end of the story either, so you didn't even get to hear the whole EI message it was supposed to communicate. (FG3)

Many participants in this study believed this particular educational medium detracted from the element of solitude necessary to facilitate moments of personal reflection – one of the primary methods seen as helping to develop a deeper appreciation for the natural environment. In addition, great educational opportunities were lost when moments of solitude were interrupted before visitors had the chance to personally discover the subtler sounds of life in a landscape that had previously seemed totally silent. Overcrowding, it seemed, contributed to the challenges associated with getting visitors to appreciate more than just the aesthetics of place (such as silent, inanimate, beautiful images of place), since the magical moments of personal discovery and reflection in place were often drowned out by the hustle and bustle of moving crowds.

In addressing the issue of overcrowding, Trevor illuminated one possible solution.

You know, we really need more trails - small ones, but more of them... If you look at Parkers Ridge, for example, on the weekends you stand in a line-up and hike up with everyone else who is there. Once you're up there, it's a bit of a different story because people can spread out and get a little peace and quiet, but I've talked to people who are asking for alternatives because they drove right past there when they saw the line of people walking up that hill... The least we could do is point out where the other smaller trails are, so that people can go places that aren't so crowded, 'cause you can bet they're not paying attention to much when there are so many people around. It's just too distracting. (FG2)

Like Trevor, a number of participants questioned current patterns of visitor-use, which tended to concentrate visitation in just a handful of primary locations, thereby limiting the opportunity to have intimate and personal experiences in the natural environment. Amelie provided interesting insight into this issue when she spoke about the problem of crowding at Peyto Lake.

No wonder Peyto Lake is such a zoo! We send everybody to the same place! ... That makes it very hard for people to have the type of experience that they are looking for... If the role of the national park is to help people get to know the environment here, then I think it is very challenging the way we go about it right now. We should try to spread people out more, we shouldn't send everyone to the same spot because it's just easier to do it that way. (Amelie, interview)

Spreading visitation out along the Icefields Parkway was suggested as one method of dealing with the issues presented by overcrowding was suggested. Participant observations confirmed Amelie's view that many of the visitors found in concentrated locations, were directed there by Parks Canada personnel. In one casual conversation I had with an employee of the Banff Visitor Information Center (participant observation), she indicated that she and her co-workers had "a standard shepal" for the people who were going to take a day or two to drive up the parkway, and recommended the same major sites, such as Peyto Lake, and Parkers Ridge, over and over again. It would seem that simply spreading people out amongst the myriad of stopping possibilities along the Icefields Parkway could pose a fairly simple solution to the problem of over-crowding.

This could restore the possibility of individuals having experiences of solitude in the places they meander through.

Another method of dealing with overcrowding issues is directing visitors away from built environments in favour of getting them in closer contact with natural ones. This suggestion is evident in almost all of the quotations above, and is emphasized further in the following example of one participant advocating that existing day-use areas could be better designed to create some “*nooks and crannies so that people at least feel like they have gotten away from the crowds and noise. We could do a much better job of designing our facilities so that you can really take in what’s around you*” (Jane, FG2)

4.3.2.3 Storytellers of place

Another sub-theme of education for a sense of place touches more specifically on the educators themselves and how their own personal connections to place defined their educational efforts. The following dialogue captures the essence of the subject.

John:

There are a lot of people in this town who do interpretation, but there are only so many who can do it as well as Mike can. It’s really simple actually. It’s because when he’s talking you can just tell that he knows the mountains. Like, he has that connection. Despite all of our training in interpretation, or like my Masters in education, I bet he’s still a heck of lot better at portraying this stuff than some of us.

Angie:

[T]his makes a lot of sense to me. It’s because he has that connection. It’s authentic. And, when people come here they want to meet people from here. If it’s less contrived, then it’s really profound, I think. You’re more likely to take what someone has to say seriously if they know what they’re talking about because they’ve been here, they’ve seen it, and they’re totally passionate about it. (FG1).

In this conversation and many others like it, study participants discussed the importance of personal connections to place, as both sources of, and resources for inspiration in their work. This is particularly salient when one considers that Mike (an accredited mountain guide renowned for his time spent in the mountains) was identified

as an “incredible educator,” despite having the least (formal) training in education and interpretation of anyone else in the room. In a separate focus group discussion, the merits of having the public interact with people who have lived and worked in the parks for extended periods of time were similarly presented.

Jane (Parks Canada Communications):

If they get to talk to a warden, or chat with an interpreter – oh! Their day is made! Especially someone like you Trevor. I mean, you’re practically “one” with this place. People can tell, and if you tell them something they’re going to listen.

Trevor (District Park Warden):

Well, I’ve been here a long time. But, I know all I know about the Icefields Parkway, or the Rocky Mountains for that matter, from interpreters. That’s the truth. When I first started here in ’73, what we have now as a bunkhouse for one seasonal worker of any sort in the summer, was the interpretation house and there were three interpreters and an attendant [up there] ...there were four people dispensing information up there all the time... One in a trailer, [and the other three] who did guided hikes, campfire talks, theatre presentations. None of that exists anymore... we have dropped the ball on interpretation.

Natasha (Professional Interpreter):

The issue is ‘time.’ You need people to commit to a career to have a life here. To be here long enough to really know and have an appreciation for this place... [Y]es, a young person brings enthusiasm, that’s true, but an older person who loves a place has a depth of knowledge that people instinctively recognize. We need to try and support that again... Because if we’re talking about education for ecological integrity, here, well, that’s a huge thing, and you can’t learn that in just one season here... Then at least you can talk about it with other people with some confidence. They pick up on that stuff.

In conversations like these, participants tended to agree that educators who brought a sense of place to their work were likely to be more influential, inspiring and effective in promoting the values of ecological integrity in those areas. Through extensive knowledge and experience of the Mountain National Parks, this sense of place was made possible.

Similar to trends in other national parks, the overall capacity of interpretative and education programs along the Icefields Parkway has diminished over the years. Numerous educators expressed a profound disappointment over the loss of Parks Canada’s full-time professional interpreters and services for guided interpretive hikes due

to funding cutbacks in the late 1980s. Since that time, many of these interpreters have opened private guiding and interpretive businesses, but the scale is incomparable to past programs and the cost restrictive for some visitors.

Most visitors seek out interpretative services from large private tour operators, who feature guided tours of the Icefields Parkway as part of a Rockies package. These tour operators employ the largest number of interpreters in the area and account for the majority of interpretation taking place along the Parkway, yet they do not necessarily offer the most experienced interpreters. Tamara, the head driver-trainer for the largest tour operator in this area illustrates this predicament well.

For me, one of biggest challenges is our guides, a lot of them anyway, are coming in for one season, and they show up and have no background... I have to try and give them as much information as I can, and then they just decide what works for them. But every year I am training all new people. This is a challenge for us.

Alan, another private tour operator expressed similar challenges.

The challenge is that a lot of our guides come here for just one season, and really, they are here to play... They haven't fallen in love with the environment here yet because they haven't seen the remarkable changes between seasons, and they just don't know the issues yet. We have to teach them this stuff, they haven't experienced it yet... Because of that, they're just naturally less passionate about trying to show all the tourists just how remarkable all this stuff is... But don't get me wrong, we need young people – they are passionate and energetic and full of ideas, but we need them to stick around for a little while. The system's just not set up that way right now. (Alan, interview)

Here again, participants indicate that individuals with a deep personal attachment to the local environment, and knowledge of the unique culture and ecology are integral to the learning experiences of park visitors. Participants voiced fears over the likelihood of qualified, talented and inspiring educators disappearing all together, as many are approaching retirement age. Educators worried that too few individuals were supported by the current interpretative services in a way that fostered a new generation of equally experienced replacements. In summary, it is important to recognize that previous

discussion of the importance of allowing “the mountains to teach” does not negate the extremely high value of inspirational educators as storytellers of place.

4.3.2.4 Education grounded in place: a summary

Education for ecological integrity that satisfies a valuing of *place* as participants’ ideas discussed above, has three major characteristics: personal connections, moments of solitude and quality storytellers. First, it is of utmost importance that interpretation efforts along the Icefields Parkway aim to provide visitors with the opportunities to get out and experience the landscape. Educators assert that the mountains are powerful teachers, but this requires an up close and personal interaction to have any tangible or long-lasting impact on their guests.

Second, when fostering a sense of place is the goal, the nature of the experience in the outdoors matters. This requires a certain intimacy with a landscape that is often achieved in times of solitude. Developing a deeper engagement with place is challenged by over crowding and the distractions due to the hustle and bustle of human activity that distracts visitors away from a deeper engagement with place.

Finally, the best people to facilitate such experiences are those individuals with deep personal attachments to and knowledge about the landscapes within the Mountain National Parks. These individuals are the best-qualified storytellers and need to be valued and supported correspondingly. The transient nature of the tourism industry, whereby new interpreters are hired every year with relatively little experience and connection to the places where they work, poses certain challenges to the interpretation efforts along the Icefields Parkway.

4.4 Ecological integrity is transboundary

While educators identified the importance of “place” with regards to understanding ecological integrity, discussions of ecological integrity were not limited to the local context. The following excerpt, a dialogue between Angie and John, builds on the idea of place, by bringing to light an additional aspect of ecological integrity common throughout study results, that of transcending the boundaries of the park:

Angie:

I look at the Park as kind of being your textbook example of a place where people should come to learn things to take home with them... Because we are protected here, and we are fortunate that protection came before [the] ecology was disturbed beyond a certain level... we're better off here than we are to the east⁶ ... But, what you learn here you can take with you no matter where you live... you learn about the ecology here, and how to respect it. Then, those kinds of actions can be fostered here, but then you need to take those with you – or else, this just ends up being an island. If we don't think about it this way, then we're not really doing much to teach people about what really affects ecological integrity... (FG3)

John:

(he jumps in)

...But when... people come to visit the Parks... hopefully the experience they'll have in this place is an intimate one and is something that's really memorable and they'll come away with some of the values of this place. So, the things we talk about here have to be applicable to people when they're at home. I mean, if you're talking about ecological integrity, then they already are [applicable outside the park], but we don't always make that as clear as we could... We get caught up in just trying to make the experience good while they're here, but it has to go further than that if we want to think about this as education to help raise awareness for about ecological integrity and these sort of issues. (FG1)

Here, participants highlight that while fostering intimate and personal experiences in place is important, education for ecological integrity must not stop there. The concept

⁶ Reference made here “to the east” refers to large-scale human developments such as the town of Canmore, Calgary, or other landscapes in the area under significantly more anthropogenic influence.

of ecological integrity serves as a means to connect the local park environment with the outside world. In the following excerpt, Daniel captures why this idea is important:

The whole idea that you can protect animals and these places and just have a park with a boundary around it without paying attention to what is happening outside [the park] just doesn't work. It's not an island. We like to think it can be, but... I think everything has to be communicated, not only the stuff that happens right inside the park... for example, ecological integrity talks about our health too... we're getting pollutants that are in the ice here [that came] from Asia, from the '60s - they're not even new. And it's coming out [of the ice] now and it's affecting the fish that are in the lake... So, we're not going to be able to achieve these goals of protecting ecological integrity unless we start to influence what is happening outside the boundaries... We kid ourselves if we think we teach people about EI and we don't make those sorts of connections for people. (interview)

Similarly, Stephen had this to say on the subject.

I would like to see the Parkway interpreted much more so within the context of the World Heritage Site, and it's broader significance. Most people don't know what a national park is for, they don't know what causes it to be designated so and what it represents. There aren't even many people who actually live here who know that its designation isn't for just cultural reasons... We need to recognize that it is the largest single temperate mountain ecosystem remaining on earth. I mean, what we are saying here is that the ecological services that are provided by this site are not only relevant to Canadians who live in this region, this has significance for all of humanity... We have to make those connections clear for people or we're not talking about ecological integrity at all. (interview)

In examples such as these, participants demonstrated their understanding of ecological integrity as one that is both locally relevant and broad ranging in scope. Participants identified local ecological and sociocultural aspects of ecological integrity, while at the same time recognizing that ecological integrity was highly influenced by (and capable of influencing) factors outside the protective boundary of the park. From this point of view, ecological integrity embodies transboundary characteristics.

4.4.1 Using natural processes to interpret ecological integrity

Within focus groups and interviews, participants identified stories of natural processes as a useful means of interpreting the transboundary characteristics of ecological integrity for the public. The following excerpts illustrate this well:

Hanna:

Good stories about ecological integrity, hey? Well, I think the global links - the big processes, the Persistent Organic Pollutants. I think that's the big picture story. You know, how we're linked to the rest of the planet and what we do there. That would be really nice to see up in the Parkway. ... Although it's still pretty accessible, it's still pretty foreign to most people, I think. I mean, here's a landscape that is pretty raw, primordial, and awesome that you don't think about that sort of stuff... What impression does a story like those pollutants have on people? And how can that help them in their everyday lives? So to me, if we want to talk about ecological integrity, I guess the big thing is talking about the whole. Like, the mountains as water-towers sort of thing. Headwaters, is a big story to me because it's the idea that it all starts here - and just the immensity of it - and then, what this means for you downstream. You know, we're all downstream. This sort of thing would be really nice to have in places like the Icefields Parkway because there just isn't a better place to tell this story. (interview)

Shannon:

Well, if we're talking about ecological integrity here, then I think ... talking about the natural processes that go on here is really important. ... People shy away from it because they think it's harder. But, if we focused more on the processes we'd draw out more connections. It would be like actually learning about ecological integrity - like what we know about the environment and how it all works. ... I find it's a real effective way of talking about things that happen here so that people realize that some of this stuff is pretty universal. (FG3)

Here, Hanna and Shannon discuss the use of natural processes as a means of talking about ecological integrity. Talking about natural processes can generate meaning for a person that is grounded in place and facilitate an understanding of how these natural places fit into the greater ecological and social contexts of the region, and the world. In the next excerpt, however, Rachel agrees, and points out that using natural processes as a method of talking about ecological integrity along the Icefields Parkway could be improved.

I think we don't actually talk about natural processes enough... You can talk about fire, and we do that, and about avalanches or something, because then you can say that this creates valuable habitat for bears... That's pretty common,

but...we don't really talk about the bigger processes that sort of point out how little control we really have here in the park... Like climate change, that's a huge one, especially for the [Icefields] Parkway.... But even species migration, we don't really talk about that outside the corridors we have in the park... We should talk about that...more... Because otherwise you get this impression that inside the park it is just utopia. Lots of people don't get that we're connected here to everywhere else... When you tell them that...this is where Calgary gets all its water from, or if you talk about the tar sands – heaven forbid - they are like, “wow!” I think that by talking about this big process stuff... it has some relevance to their own lives. (interview)

As this excerpt demonstrates, educators appeared to understand the importance of interpreting larger process-oriented stories, and indicate that these are not communicated often or well enough. The following larger scale natural process ideal for communicating ecological integrity are embedded in focus group and interview conversations (in order of popularity): climatic processes (climate change), basic hydrology and watersheds (associated with the mountains as water towers concept), global circulation and bioaccumulation of persistent organic pollutants, species migration, and increased weed transmission and persistence. According to participants, these “big picture stories” illustrate well the local, regional and global scales of thinking required to adequately understand the concept of ecological integrity within the Mountain National Parks.

4.4.2 The Mountain National Parks as a system of protected areas

Participants illustrated that connectivity and transboundary characteristics of ecological integrity were often forgotten, even though this was part of Parks Canada's operational mandate. Jane, provides one such example.

I get really frustrated because I think that people tend to look at the parks as just isolated chunks. But they are just one spectrum of the whole landscape. It is a system of protected areas. I'm emphasizing the word “system” here. There should be core areas within a regional landscape and if you cover the whole spectrum, then hopefully the whole system is just that much healthier. (FG2)

Similarly, Cameron had this to say on the subject.

Our national parks are part of a bigger effort to protect ecological integrity for Canadians, not just about protecting ecological integrity of a park. You can't do that in isolation, it just doesn't work. It's not like when we used to think that you could just protect something from development and it would be fine. There are bigger processes that support all of this... I'm just trying to say that people know that the whole thing with parks is that they will only work to protect ecological integrity if they work together as a system. We're really far away from that actually being reality here. In fact, a lot of people don't even know that this is the ultimate goal.

Here, participants highlight once again the importance of communicating the connection between protecting ecological integrity within a local, regional and even global context. The ecological complexity and multiple stakeholder involvement make management at this level very complex. However, failing to adequately communicate to park visitors that the Icefields Parkway is part of a system of all of the Mountain National Parks, and that these are in turn just one small component of a national system parks, may actually limit Parks Canada's primary management goal of managing for the protection and enhancement of ecological integrity.

4.4.3 Stewardship for ecological integrity extends beyond activities in the park

Typical interpretation within the park has focused on local mitigation rather than regional understanding and active stewardship. Urging individuals to stay on the trail, to not pick flowers, or to not feed the wildlife are all examples of mitigating local human activities to prevent environmental degradation, and all were common to interpretive efforts at the time of research. However, in discussing the role of communication in achieving adequate stewardship for ecological integrity, many participants spoke of a transboundary element that is not currently addressed. In the following dialogue between Natasha and Jane, they consider this issue in the context of climate change:

Natasha:

The question remains: Is it Parks Canada's job to educate people on climate change? That is a big question, a really interesting one, especially in the context of this discussion when we are talking about ecological integrity.

Jane:

I would think that it is, because ultimately our national parks are representative of the landscape and ecosystems, ecoregions or ecozones in Canada. Well, all that is going to change through climate change. So, you have to, if you think that we are trying to protect the resource. You almost have to talk about it. No?

Natasha:

... But here again, the question becomes, 'What is your stewardship message?' Is it, "This is what you can do to help prevent Climate Change?" Or is it, "Here's what you can do to help protect these ecosystems while you are here right now as it relates to climate change?" ... Based on what we know about the way ecosystems work and how everything is connected to everything else and what you talked about earlier about parks being a system of protected areas – they're not islands – then I'd say you have to. But that's not really happening right now, I don't think. I mean, some individuals are saying stuff, but it's not the focus of interpretation right now.

While this dilemma over the focus of stewardship messages in the Mountain National Parks was a prominent theme, there was a general consensus on the requirements of future messages. Participants tended to agree that stewardship messages with a broad scope most closely illustrated their ecological integrity ideals. It was also agreed that messages targeting people's every-day choices would be more likely to help maintain the ecological integrity of places like the Icefields Parkway. This is linked to the knowledge that the significant ecological stressors identified as affecting the area (such as climate change) are driven by current human activities taking place both inside and outside the park.

At the time of fieldwork, an investigation into which stewardship messages were actually used in relation to ecological integrity revealed an emphasis on specific mitigation messages as opposed to broader messages targeting ecological understanding. First, there did not appear to be any guidelines for content or focus of these messages. One seasonal Parks Canada interpreter flagged the situation this way:

Whenever you're talking about ecological integrity, I think it's really important to have that stewardship message there, too. ... But we're really not given a lot of guidance as to what that message has to be ... I would really like to talk about more than ... how to be safe around bears [when you're in the park]. I mean, if we're really addressing ecological integrity and you're talking about bears, shouldn't I also talk about all the troubles that the bears have just outside the boundary where they're not protected? Or, talk about how many get hit by the

train that comes through the park spilling grain on the tracks? ... So, it would be nice if the stewardship message was just to make you mindful of all these things. So that when it came time to vote, or whatever, you could act to protect the bears in other ways. ... I'm a bit nervous to say some stuff sometimes because that's just my own personal knowledge that I learned somewhere and there's no way that Parks is going to give me the okay for that ... I'm not sure that I'm aloud to talk about some of that stuff, actually. It's not really clear how far the stewardship bit should go. ... (Shannon, FG3).

Here, Shannon's struggle over how far to take stewardship messages for ecological integrity highlights a failure on the part of Parks Canada to provide clear guidelines on how to incorporate the values of ecological integrity into education. Furthermore, it also suggests that big-picture stewardship messages are not supported by the Agency. Interestingly, in a separate interview, Cameron also mentioned the idea of targeting consumer choices in relation to stewardship messages for ecological integrity, albeit with some frustration. Cameron framed the broader significance of the issue this way.

... this ties into my whole issue with the concept of ecological integrity, because it is one thing to define it, but I think there has to be some prescription and guidance there on how we achieve it. So, whether it's limits, or whatever it is, there just needs to be that information about 'what you can do', so that people know what it means to manage for ecological integrity, ... right now a lot of people don't even know what it would take to make that possible... and right now, a lot of those things are in the hands of people's everyday life choices. ... (interview)

Here, Cameron suggests that a lack of definition around the stewardship messages for ecological integrity may well be tied to a lack of definition over the social dimensions of what it means to manage for ecological integrity. From this point of view, the ambiguity currently associated with ecological integrity from a social standpoint has resulted in ambiguous and often "watered down" (Cameron: interview) stewardship messages. Regardless of the reason, failure to couch ecological integrity stewardship messages within the broader ecological and social context may well have detrimental effects on the whole educational process. An excerpt from Robin provides an interesting example.

... some of the guides they get on the bus and they're talking about ecological integrity all day. But then, when they get off work, they get into their cars and they drive home and they only live, like, six blocks away or something. ... They don't see how their actions connect to anything that they talk about out there in the park, even though they're supposedly talking about natural history all day. ... I wish, when we were giving our stewardship messages, ... that they were bigger than just "don't feed the animals", because then I think that a lot of our new guides would learn something, too. (FG3)

This insight from Robin suggests that failing to communicate the values of ecological integrity in a manner that ties the realities of the people's everyday lives to the realities of life inside the park boundary, often reinforces a park-centric understanding and interpretation of ecological integrity. For this reason, participants were critical of overly narrow stewardship messages when the goal is to foster an understanding of ecological integrity – a transboundary concept.

4.5 Ecological integrity and the role of people in nature

Discussions about ecological integrity often paralleled discussions about the preservation of wilderness and the role of people in nature. There are two major schools of thought regarding how people perceive their relative connection to the natural world. This next section presents both these viewpoints, as well as the ways in which they have shaped educational messaging.

4.5.1 People versus nature and the wilderness message

The first viewpoint identifies a close relationship between the concept of ecological integrity and the perception of wilderness as nature without people and their associated destructive activities. The following exchange between one commercial interpreter and a Parks Canada communications employee (respectively) provides one such example.

Robin:

...ecological integrity, to me, makes me think of wilderness, and when I see that, there's probably not a lot of us people there. Or, if there is, we aren't having much of an impact. ... I guess when I think about managing for ecological integrity, I think about trying to protect a resource...

Shannon:

So, you mean protection from people?

Robin:

Yeah. That's exactly what I mean. Ideally, anyway... We take people out of there. (FG3)

In another example, Tamara had similar thoughts.

When I think of EI, I think of...nature - probably a lot without us in it. That it's [about] the least impact that we could possibly have ... I guess I think about wilderness... Obviously we're a part of nature,...but I don't know if you can manage for true ecological integrity. ... I think you have trouble defining EI when you are trying to manage it so much, because then people are there and they're influencing it too much (FG1)

In excerpts like those above, the notion of ecological integrity necessarily involved the protection of nature *from* people. In these views, the distinguishing factor is that there is relatively little focus played to developing an understanding of the relationship people have with nature (and that this relationship isn't always, or inevitably, destructive). It is likely that this perspective has a long-standing history in the Mountain National Parks when one considers the evolution in ecological understanding and corresponding park management measures. Although the management goal of preserving wilderness through simply limiting human activity is less common today, evidence of this perspective on nature was still observed during field research (approximately 20% of all respondents).

Cathy responded to Robin's above comments about ecological integrity as the "protection of a resource" in an interesting way. Her insight brings to light the potential conflict between business and preservation when this perspective of ecological integrity is applied.

Well, that is how the business people think – that ecological integrity is just about protecting a resource. They see it as locking up a resource. ... that sort of thinking is responsible for a lot of the conflict that takes place between business development and the park management, or maybe I should just say between business development and those who of us who see that there is more to ecological integrity, or wilderness, than just conserving a resource. ... (FG3)

Like Cathy's comments made here, numerous educators shared similar accounts of conflicts stemming from perceptions of Parks Canada's ecological integrity mandate. Embedded within these conflicts, as described by study participants, was what appeared to be a controversial choice associated with the notion of ecological integrity: people or wilderness? Field observations provided additional evidence of political tensions over the incorporation of ecological integrity into Parks Canada's operational mandate. A casual conversation with a business manager of a major visitor attraction located on the Icefields Parkway revealed that s/he is wary of protection and enhancement of ecological integrity within the Mountain National Parks as the primary management objective for the area. Field notes taken immediately after one such conversation provide the following paraphrased quotation.

I'm not the biggest fan of this whole ecological integrity push. It's just gone too far. ... I think of the politics here in the Park like a bit of a pendulum. When things started out here it was all about people – the park was built up around the railway and around tourism. ... But then the pendulum swung to the other side of things where it was all about preserving the environment, protecting wilderness and about keeping people out. ... It went too far. There is a long history of people being here and you can't just stop that because you want to preserve ecological integrity ... But, I think that Parks is coming around now because they realize that they need people – people pay the bills. ... Anyway, when I hear the word ecological integrity I cringe, because it's just not realistic. ... You need people to come to the park, you need people to be able to do things here and to be able to have business if this thing is to work (business manager: participant observation).

Interestingly, the comments above correspond with the earlier framing of ecological integrity as natural resources protected from people. Building upon this point, a quotation from Daniel, provides some additional insight.

You know, from my experience a lot of the business people here in the park, unfortunately, they don't understand how this whole concept of ecological integrity affects them, too. To them, ecological integrity is often seen as restrictions – it's like "Here's wilderness, now don't you dare touch it." ... That's not the way I see it ... [T]he point is that there are people who associate ecological integrity with restrictions and I think it's because they aren't personally in touch with how this whole thing, how ecological integrity is actually much bigger than just restrictions. You know, that they're actually a part of it, and benefit from it. So, sure there are certain things that we shouldn't do if we want to protect this place, but it's not like they don't also benefit us. (interview).

In the above examples, there is a clear distinction made between Parks Canada's mandate of ecological integrity and some people's (mis)perception of it. While Parks Canada certainly does not aim to "keep people out of parks", participants described situations where appeals against the Agency's ecological integrity mandate appeared based on these grounds. This disconnect is especially evident within the tour business community. However, numerous participants pointed out that there is a difference between isolating people from parks and keeping parks from turning into parking lots, towns, and shopping malls.

Moreover, perceptions about the Parks Canada ecological integrity mandate implying an absolute absence of people from the landscape parallel older conceptual divides between people and wilderness. As Daniel went on to explain, it is likely that persistent worldviews such as this one, presented barriers to a mandate meant to foster appreciation and support for the protection of ecological integrity in national parks and beyond.

4.5.1.1 People versus nature education

In this section, the implications of the *people versus nature* view of ecological integrity for educational messaging are presented. An excerpt from Robin (who previously associated traditional perceptions of wilderness with ecological integrity) is helpful in this regard:

Robin:

For me, being on the road and talking about ecological integrity with my passengers, I really try to talk about the expansiveness of this place. ... [O]ne of my biggest things is to just tell people how big Banff really is. ... [W]e are only seeing such a small part of it because this where the roads are accessible on it. But the rest of this place doesn't have any roads and it is real wilderness. And then I say: "We aren't even going to enter into Jasper today and it is even bigger than Banff." You know, so I just talk about the size of these places so that they get the idea there is true wilderness out there for the animals to move around and then they can have diversity and stuff. (FG3)

Here, Robin identifies that one of the most prominent messages she aimed to convey in her commercial tours, when talking about ecological integrity, was the very idea of wilderness. Her emphasis was on those places far away from the road, where animals were free to move around without human influence. To her, ecological integrity was the protection of these natural landscapes from roads, thus her discussion of the betterment of ecological integrity along the Icefields Parkway focused on helping people to see the extent of wilderness already preserved.

In the following section, a second viewpoint is presented that usually went further than simple celebrations of wilderness, characterized by little human influence on the landscape. This conceptualization of ecological integrity more closely represented the majority of study participants who expanded on traditional notions of wilderness in a way that reflected changing values around the ecological integrity concept.

4.5.2 People are a part of nature

Although some participant perceptions of ecological integrity relied heavily upon a worldview that separated people from nature, the majority of participants who formally commented on this issue emphasized the *inseparability* of people from nature. Interestingly, this viewpoint became evident in a separate focus group discussion whereby John (an environmental educator currently developing an outreach education program for Parks Canada) commented on the wilderness approach to ecological integrity interpretation as identified in the previous section. He had this to say on the subject:

Sometimes it's tempting to just think 'let's just build a great big fence.' That way you can just keep all of us away and that'll save it. Since I got here and started to work with the third-party deliverers of interp[retation] I noticed that they talk about ecological integrity as if it were something that only applied here in the park. You know, like they talk about wilderness and how it is protected from our destruction 'cause of the fence. But the thing is, that won't save it. ... Actually, I think it's pretty misleading to talk about EI that way. (FG1)

Robin was not the only one who focused on interpretive messages that emphasized the preservation of wilderness as their main means of communicating the values of ecological integrity. However, as John suggests, taking the idea of wilderness as synonymous for ecological integrity may well be too narrow a message to adequately communicate the issues when managing for ecological integrity. In one interview, Stephen built on this idea and made a distinction between the two.

The old ideas where we just didn't see that we were a part of nature, or that we are a part of ecological integrity, have resulted in a park system that is far from being able to adequately protect what it is meant to protect today... Of course, we have always understood that people could have an impact on⁷ natural parts and processes, but actually thinking that we are genuinely a part of these systems is a different way of looking at things. ... Parks Canada still has a long way to go before it stops perpetuating these old ideas of endless, pristine and totally protected Canadian wilderness if we want people to understand what's really at stake here. (interview)

Here, Stephen asserts that perceptions of ecological integrity that set people's activities in conflict with the natural world (by only recognizing their impacts *on* nature) is a misguided interpretation of the multitude of ways in which people are intimately "connected *with* the natural realm" (interview).

He also points out that in order to protect the integrity of Mountain National Park ecosystems, the innate connection between people and nature must be recognized. Stephen shares his recognition that parks are not necessarily wilderness, nor are they necessarily pristine, because we now know that our activities cross park boundaries, parks are often too small to protect the species they are meant to (such as caribou for instance). From this standpoint, recognizing that we are a part of nature implies the

⁷ Underline indicates places where participants placed extra emphasis on a word or phrase.

importance of understanding the depth and scale to which this is the case. Conversely, it does not mean that any and all human activities are deemed to be okay, simply because they are we too are a part of nature.

Seeing ecological integrity as something that people cannot meaningfully be separated from may signal a new way of understanding park environments. Angie, provides one such example of the ways in which participants demonstrated this conceptual shift.

I still think that there truly does need to be wilderness, but not because of the reasons that you may think. I mean, I still think we need wilderness for the animals and all the natural processes and diversity and that sort of stuff – we still need to recognize how special it is to have these places. ... [But] it's important to have wilderness because everything is connected to everything else, and we benefit from wilderness. ... It's not like those places don't have any impact on us, or even that we don't have any impact on them just because we aren't there all the time. ... I think that a lot of people miss this point when they think about wilderness, or about ecological integrity. ... the point is that just leaving something alone and having that be "wilderness" is important, but it's not enough on its own, and that's not all that ecological integrity is about because people are a part of that whole picture... (FG3)

For Angie, to maintain a state of ecological integrity, the protection of wilderness is still very important. In her view, however, the idea retained value in and of itself, in addition to the services these areas provide for people and the broader environment. This valuing of the biophysical connections that exist between people and places of wilderness may represent a shift away from traditional wilderness values, towards a new understanding and valuing of ecological integrity. An example of this conceptual shift was evident in the following excerpt from Jane.

Well, first, I just want to say that I don't see people as being separate from ecological integrity. ... it's less about people owning the land and managing the land, and it's more about thinking back to how the land shapes cultures and societies, and how we are a part of all that. ... I guess in an ideal world we'd value those connections more. That's what I'd like ecological integrity to mean. ... And hopefully we'd have healthier societies and communities based on that. So to me, it comes back to living more holistically on the land no matter where you are, because we're connected to the whole system. ... (FG2)

Like numerous other participants in this study, Jane felt the need to be explicit about the idea that people were not excluded from their personal interpretations of ecological integrity. Furthermore, Jane was one of five other participants who suggested that to adequately interpret the values of ecological integrity to others, educators needed to help redefine how people view themselves in relation to places of wilderness. The following section explores the ways in which participants discussed the idea that people are part of nature with regards to education for ecological integrity.

4.5.3 Education for people and nature

Suggestions gathered from participants indicate that education that honours their personal definitions of ecological integrity would help people to understand and feel that they were part of nature. Phillip provided an eloquent summary of this idea in his reflections on interpreting ecological integrity to park visitors.

We have to remember that, even though it looks like there is little human role in the ecosystem up there [in the Icefields Parkway region], and it appears to be what we all imagine wilderness to be, if we just stopped [the interpretation] there, then we wouldn't be talking about ecological integrity at all. Because we would be totally ignoring all the other processes that still influence that incredible place even where no human hand has ever touched it. ... And to me, this is where we talk about the people who traveled this ice a thousand years ago, and things like the pollutants in the ice that have traveled there all the way from Asia and made the fish in Bow Lake unsafe to eat, and we talk about climate change ... and we talk about all those things that connect people with ecological integrity in good ways and bad and they can take that home with them. And hopefully they leave with a better understanding that: whatever they do at home matters, even for the wilderness way up there on the parkway (FG3)

Here, Phillip captured a view expressed by the majority of study participants, dispelling the idea that people were somehow separate from nature (no matter how remote). The Icefields Parkway is generally viewed as possessing the highest level of ecological integrity in the whole of the Mountain National Parks by virtue of its relatively undeveloped state (participant observations). Yet, Phillip and others cautioned that this conception of ecological integrity is far too simplistic. Participants highlighted the need

to move away from interpretive messages about ecological integrity that emphasize the protection of wilderness *from* people, in favour of messages that recognized the ways in which people are connected *with* nature. In the following excerpt, Dean teases out the subtle differences between these two worldviews.

Well, when people talk about ecological integrity here I often hear them talking about “threats.” To me, I try never to state it in this language. To me, these things like pollution, or fires, or floods, they’re not threats, they are a part of big natural processes. The whole idea of “threats” is too external to the process – I don’t actually think there is such thing as a singular threat, because these things that get labeled as “threats” are always bigger ... This doesn’t mean that we just don’t do anything about it. ... It means that we ... have to figure out how we contribute to these large processes, how we are a part of how the whole system works. This is different from trying to figure out how we impact something external to us. I’m not saying don’t be wise, I am saying – let’s use our wisdom and be aware of our place in the process. (interview)

Dean summarizes the majority sentiment of study participants that interpretations of ecological integrity that fail to encompass humanity are misleading, overly simplistic, and not likely to contribute to a genuine educational effort to uphold the values associated with the protection of ecological integrity. Study results suggest that education for ecological integrity would help people to personally identify *with* the concept of ecological integrity, rather than solely the effects of one’s life *on* ecological integrity.

4.6 Ecological integrity and continuous change

The fifth theme is the notion of continuous *change* imbedded in the concept of ecological integrity. Participants rejected static representations of ecological integrity in favour of a concept that integrates change. Daniel provided one such example.

Ecological Integrity, to me, means that you’ve got a place where all the things that are native to the area are there, including the people, and they are able to interact with one another in a way that is ultimately sustainable. So, there is change involved in that, but there are changes within certain boundaries. It’s a flexible and dynamic system, and if you have it in place, then you have a healthy culture and a healthy environment. To me, the whole idea of an ecosystem being free to evolve is really important... (interview)

Similarly, Trevor had this to say.

One thing to keep in mind about the Icefields Parkway is that it has changed a lot over the years. ... we think of that place as having a lot of ecological integrity, and because of that I think that a lot of people think that it probably looks the same now as it always has – but actually, it still changes all the time. ... Those changes happening in the landscape are a part of the integrity of that place, but a lot of people don't realize that. (FG2).

As these quotations exemplify, change over both short term and long evolutionary time frames is central to the idea of ecological integrity. One aspect of participants' personal interpretations of ecological integrity centered upon dynamism and change. Of similar importance was that ecosystems with integrity could maintain the capacity and freedom to evolve. With regards to interpretative and educational efforts, Angie addressed the theme of change this way:

What about all the geology that we could talk about, and all the archeological sites? There is so much information there and it goes back thousands of years. ... So, many of those same places that we stop and look at today are places that people have been stopping at for 10,000 years. Just think of how different it was back then. I wish when people heard the words 'ecological integrity', that what came to mind wasn't so static. A lot of people think that this place doesn't change just because people haven't initiated that change. ... Really, it's all been changing together the whole time and I don't think that gets enough attention. (FG1)

In this excerpt, Angie's suggestion that archeological and geological history could help visitors understand the change within the Icefields Parkway region, and identify with the concept of ecological integrity. Angie was not alone in these concerns as evidenced by the following interview excerpt with Dean.

I have to admit that I've never really liked the way Parks talks about EI because it has this connotation that it's a static thing. From my background as a geologist and an archeologist, I've learned to look at things as if they are always evolving. ... I really think that we need to educate the public that this is a moving target, it's an evolving thing. ... But my definition of ecological integrity, since you're asking, would have to tie in with the recognition of changes through time, with

history, with the idea that we are all a part of what's going on, the idea that the integrity of 3000 or even just 200 years ago would not be like that of today. This, in my mind, needs to be understood, or at least, needs to be a part of the thought process. (interview)

In this excerpt, Dean suggests Parks Canada's conventional communications approach involves static and simplistic interpretations of ecological integrity. Significantly, he also discussed the idea of ecological integrity and change in relation to understanding humans' roles in the ecosystem within appropriate time frames.

Another quotation from Dean is helpful to identify how the vocabulary used in interpretation could be improved to reflect the principle of change.

Dean:

In a lot of interpretation today, we hear the word "discovery." The Europeans, ... they "discovered" the mountains, ... they "discovered" the Columbia Icefield, and so on. ... They need to take the ... word "discovery" out of all the documents. ... The whole notion of "discovery," besides its really colonial connotation, implies that there is a static thing to discover. Well the Europeans who "discovered" the hot springs, for example, didn't discover just some physical thing. They stumbled upon a place that was very intricately linked to an evolving, changing and dynamic ecosystem, and a place that had all sorts of really special links with groups of people and the rituals that they performed there and so on. ... to say that it was "discovered" implies that no one had been there before, when actually, people had been visiting that spot for who knows how many hundreds of years... So, anyway, this is just to say that if you really want to talk about ecological integrity, which to me is the full range of life, then we need to get rid of these still pictures that don't adequately represent the scale of change and complexity involved in that whole picture. (interview)

Participants cautioned against interpretations that overlook the complexity of ecological integrity. Through use of static representations of place, there is a risk of maintaining outdated colonial ideals and misrepresenting the cultural and ecological heritage of these areas. The following excerpt, describes a method of communication to help visitors to conceptualize this relative complexity.

Jane:

We have all sorts of cultural stories that we don't really tell. ... You can talk about, at this time when this happened, here's how many people were living here

and there was no road here, or this is what they used to hunt and eat here... When you do this, it makes it easier to give people, not just that connection in space, but that connection in time as well. ... That way, people can easily compare their cultural story with the ecological story. I think that this would be a powerful thing, because people don't know... that the history of this place has gone under so much change and just how far back these stories go. So, just trying to tell the cultural stories with the ecological ones could help people get in touch with how much all this changes, and that's a part of ecological integrity too. If we do that, then maybe we could even ask questions like 'where will we be in a hundred years?' ... [A]nd, just how fast are things changing now compared to in the past? (FG2)

As shown here, participants suggested that educational efforts to link cultural history with the environment makes it easier for visitors to understand the context and scale of past and present changes. From this perspective, interpretation that included the principle of change would help to raise awareness about the value of and beauty of self-evolving systems, while also illuminating the unprecedented scale and speed of change taking place in the Mountain National Parks, and the world as a whole.

Participants stressed the value to placing human-nature relationships in its historical context, thereby illuminating the evolving and dynamic nature of life in these places. While personal interpretations of ecological integrity from this vantage point were common amongst the individuals involved in this study, it is important to note that interpretive or educational efforts in the Icefields Parkway region that paralleled these principles were much less common. As such, study results suggest that interpretive efforts used to communicate the value of ecological integrity could be improved upon in the Icefields Parkway region with an increased focus on the theme of change.

4.6.1 Continuous learning & ecological integrity

In the context of learning, the principle of “change” was a particularly salient theme. Not only were participants quick to point out the ever-changing nature of ecological integrity, but they also emphasized that people’s *understanding* of ecological integrity was also changing. An excerpt from Shannon provides one such example.

Another thing about ecological integrity is it's something that we're working towards, we're aiming to recreate here. But as you can see [in my drawing] here the circle is not quite complete. That's supposed to represent that it's a work in progress and it's always going to be a work in progress. You can't just achieve it and say "Oh, okay. There, we're done." (FG3)

Stephen, also made reference to the evolving knowledge around the ecological integrity concept.

I've been following the progress on the ecological integrity argument because it's important. I recognize that in the context of a national park, it had originally meant the management of ecosystem changes and also the influences of people within the park. ... It was about keeping the pieces connected and keeping all the pieces working, and eventually, it was also that people were an element of these ecosystems. ... Principally, the fact remains that one of the key elements of ecological integrity is informing people about what you are learning, what the gaps are, what we need to know in the future. ... It's a constant evolving re-education of people about how these ecosystems work, and their meaning within a protected area. (interview)

The emphasis placed here on the importance of continual, evolving and responsive learning in order to adequately understand and honour the nature of ecological integrity, is consistent with the principle of change previously identified. In excerpts such as those above, the concept of ecological integrity was not portrayed as something that just "is" with unquestionable status. Rather, it was a concept developed by people to aid in their exploration of the ways that ecosystems sustain themselves and evolve over time. It was also a concept that provided a framework from which people could reflect upon the social values associated with managing for ecological integrity. Recognizing changes to ecological understanding, Trevor reflected on the corresponding change in interpretation in the Icefields Parkway over the 15 years of his career in the private coach tour business.

To me, ecological integrity actually has a lot to do with evolvement. ...[F]or example, we never had a question about global warming, or anything like that. ... But what I see is that awareness is evolving as people travel around the world and learn more from people like us who work in interpretation. And at the same time that this is happening, those who are in interpretation are having to respond to new questions and new trends and new information that has been learned

about ecological integrity. So to me, part of ecological integrity is staying on top of that change. (FG2)

Like Trevor, numerous educators pointed out that a growing awareness of issues like climate change has increased public demand for information regarding ecological integrity and forced them to reconsider many of their previous ideas around the concept.

Participants discussed the need for an educational approach that is flexible and responsive to an evolving body of knowledge since the knowledge gained from research on ecological integrity is no more static than the integrity of the ecosystems themselves. Extending this logic to the interpretive realm, one participant summed it up this way:

“We just need to get past the idea that these parks are just pretty pictures. They are moving, living, changing, dynamic, fragile, interconnected spaces!” (Rachel, interview).

Study findings suggest that for ecological integrity education and interpretation to remain relevant, it must reflect a notion of ecosystem integrity that is inherently unknowable.

This reflected the idea that there is no one “truth,” that things are always changing, and that innumerable perspectives exist with which to interpret ecological integrity and the associated issues at hand.

4.7 Ecological integrity and connectedness

Well, the thing...with ecological integrity is you can talk about anything because everything is connected to it in one way or another. ... I guess that's sort of what it's all about – it really is that whole idea that everything is connected. (Julia, interview)

The final major theme revolves around the concept of connectedness. The idea of connectedness is evident within the five themes already addressed. The following table provides a summary of the ways connectedness is linked to the other themes. The table has been organized according to biophysical and sociocultural dimensions.

Table 3. Connectedness study theme table

Study Theme	Biophysical connection	Sociocultural connection	Example
<p>Health & Wholeness</p>	<ul style="list-style-type: none"> - multiple ecosystem connections = healthy and resilient ecosystems characteristic of EI. - Education for EI about discovering what some of biophysical connections in the ecosystem are, communicating the complexity and degree of interconnectedness. 	<ul style="list-style-type: none"> - "health" as a metaphor for EI helps to connect the idea of ecosystem health with the experience of human (ill)health - Feeling of "wholeness" associated with EI only accessible through personal experiences in whole and healthy places characteristic of EI - feeling of wholeness an emotional, or even spiritual connection to places with EI 	<p><u>Biophysical Connection:</u> <i>"I guess if I'm talking about ecological integrity I talk a lot about things like processes and why they are really important, because of all the connections. Processes and connections, I think are... really big things and things that people can see all around them. Like when we talk about, a connection between fire and the mountain pine beetle, and a forest health and about healthy animals, and connecting all those dots for people, that's something people really understand cause they can see it all around them."</i> (Owen, interview)</p> <p>Participant describing her drawing representing what ecological integrity means to her: <i>"I also have other animals, and ungulates and other waterfowl, and weather systems, and landforms, and all of those things that are in the soil, and... not everything is totally charismatic, but everything is important because it's connected to everything else. ...so I drew all the links between them."</i> (Cathy, FG3)</p> <p><u>Sociocultural Connection:</u> <i>"One ecological integrity message is: the environment's health is our health too."</i> (interview, Janice)</p> <p><i>"The whole thing about what you're saying here is that on the surface we're interpreting connections as a physical interaction. But, if ecological integrity is spiritual, then you also need to make a spiritual ecological integrity connection."</i> (Phillip, FG3)</p>

Table 3. Connectedness study theme table (con't)

<p>Place</p>	<ul style="list-style-type: none"> - Implicit in the PC definition of EI, is a <i>valuing</i> of the unique and special nature of specific ecosystems (native specie, supporting processes, unique geological history, etc.) - Unique biophysical connections and relationships unfolding on a particular place (individual 'pieces' may be similar to other places, but the relationships between them are unique.) - this makes it interesting and exciting to learn about the EI of particular places - IFP is an ideal location to discuss biophysical connections in the landscape because they are especially visible (i.e. slide paths, fire patterns, various habitat types, glaciology, etc.) 	<ul style="list-style-type: none"> - coming to understand and appreciate the concept of ecological integrity <i>starts</i> with personal connections to relatively whole and healthy natural spaces. - Individuals who are moving through the landscape personally interacting with the life all around them are likely to have unique experiences place 	<p><u>Biophysical Connection:</u> <i>"A couple that I like to talk about when I am out with clients...are...things like the fire, and the effects on the White Bark Pine ... And the fungus that can actually be detrimental to the White Bark Pine, but that the fire can actually help control. But, that the tree relies on, or can rely on a bird – the Clark Nut Cracker, to cash seeds and then not actually eat all the seeds so the tree can germinate them. Then the lichen that the birds...inadvertently distribute, that only grows on White Bark Pine and so on. So, the cycle of things, and those connections are just an example of that.</i></p> <p><i>I find that those kinds of examples just bring things down to a level that people begin to see that there's a lot more to this place, so that they start to see that everything is connected to everything else. And so, obviously, if we can maintain those connections, or as many of those connections as possible, then inadvertently you are maintaining the integrity of the ecosystem."</i> (FG1, Angie)</p>
			<p><u>Sociocultural Connection:</u> <i>"To me, ... we operate on an individual basis, our connections to wilderness happen as individuals, which is why you want to go out there and have your own version of wilderness. ... [W]e need to somehow find more experiences on the Icefields Parkway without more infrastructure that imposes on people's experiences, and dictates them too much away [from] that feeling that still allows people go out there and experience the place however it happens to be that day."</i> (Phillip, FG3)</p> <p><i>John:</i> <i>"Well, you know – there are a lot of mountain guides here...but there are only a few who can connect with kids the way Mike can. That's because they know that he knows that he knows the mountains."</i></p>

			<p>Krista: <i>"That's because he has the connection. People can tell, and those of us who actually have that connection deliver a message that has more integrity than those who just aren't personally connected to the area to the same degree."</i> (FG1)</p>
<p>Transboundary</p>	<ul style="list-style-type: none"> - Ecosystems do not operate in accordance to political boundaries. - Educators indicated that more attention paid to issues that transcend park boundaries was needed. - Interpretation of natural processes would make these transboundary connections. 	<ul style="list-style-type: none"> - Need to think of protected areas in the context of a system of protected areas – move beyond parks as islands problematic - Stewardship messages extend beyond park boundaries - Education that helps visitors to understand how what they learn along the Icefields Parkway has ramifications for other places outside park boundary, and vice versa. 	<p><u>Biophysical Connection:</u> <i>"Well, when we talk about stories to tell, and this is for the Icefields Parkway too, I get really frustrated sometimes because I think that people tend to look at the parks as just isolated chunks. But it is just one spectrum of the whole landscape. It is a system of protected areas. There should be core areas within a regional landscape and if you cover the whole spectrum, then hopefully the whole system is just that much healthier ... you can't talk about the ecological integrity of the park in isolation from the realities that exist outside the park."</i> <i>(Jane, FG2)</i></p> <p><u>Sociocultural Connection:</u> <i>"I also think the global links are important. The Persistent Organic Pollutants. I think that's the big picture story. You know, how we're linked to the rest of the planet and what we do there. ... I guess the big thing is just the whole mountains as water-towers thing. Headwaters, is another big story to me. The idea that it all starts here and just the immensity of it and also what this means for you downstream. You know, we're all downstream, that's about understanding ecological integrity too."</i> (Hanna, interview)</p>

Table 3. Connectedness study theme table (con't)

<p>Role of People in Nature</p>	<ul style="list-style-type: none"> - Biophysically, connections between people and the natural environment are inescapable – to understanding EI - drawing out the ways in which people are connected to nature, as opposed to being separate from, or simply having an outside influence upon EI plays a key role in coming to understand ecological integrity 	<ul style="list-style-type: none"> - a cultural shift towards recognizing how intricately linked people are with nature - cultural stories and ecological integrity stories are also linked, and told accordingly - stewardship to protect ecological integrity based on understanding human connections with nature and making conscientious decisions based on this knowledge 	<p><u>Biophysical Connection:</u> <i>"Well, we just need to get people to see how their actions effect the integrity of these ecosystems. And also, I wish we did a better job of showing how people's lives physically depend the health of these ecosystems. Really there's nothing that we do that happens in a vacuum, so we need to be responsible about our actions."</i> (Shannon, FG3)</p> <p><i>"If we could just teach our visitors where their own water comes from, that would be teaching ecological integrity."</i> (Trevor, FG2)</p> <p><u>Sociocultural Connection:</u> <i>"I think that you can have a correct approach to nature and to ecological integrity and still do what humans do. But you don't have to have a river next to an open sewer. You don't have to go that way. That's the easy way, that's the irresponsible way. So, I think that EI education is trying to get people to be human, to do what humans do in the responsible way: in the stewardship way, ... to promote the health and wholeness. ... [H]opefully EI education would teach us to act more responsibly."</i> (Trevor, FG2)</p>
<p>Change</p>	<ul style="list-style-type: none"> - the dynamic nature of ecosystems that have retained their freedom to evolve - natural processes, which link one place/thing with all surrounding life 	<ul style="list-style-type: none"> - concern raised by educators that the EI concept implied that places of nature were static, unchanging - a need to better represent the long history of changing interactions and relationships between people and place 	<p><u>Biophysical Connection:</u> <i>"We just need to get beyond the notion that these parks are just pretty pictures. They're moving, living, changing, dynamic, fragile, interconnected spaces!"</i> (Rachel, interview)</p> <p><u>Sociocultural Connection:</u> <i>"It's the idea that we are all a part of what's going on, the idea that the integrity of 3000 or even just 200 years ago would not be like that of today. This, in my mind, needs to be understood, or at least, needs to be a part of the thought process."</i> (interview: Dean)</p>

Although the notion of connectedness is applied to each theme, the primary message behind the principle of connectedness is that no single theme can adequately represent the full concept of ecological integrity. It is only when the above principles are presented *together* that they can tell the story of ecological integrity in the Mountain National Parks. The concept of connectedness appeared relevant to participants both personally and externally. The following excerpt from Paul illustrates well how the act of drawing connections on multiple levels eventually led to his current understanding and respect for the ecological integrity of the Icefields Parkway region.

For me, it all started with a snowflake. Simple. Because, I liked skiing. I came west, I was fascinated with the Columbia Icefield, and started working for Parks in a couple of different positions. So, sure, there was learning that happened there, but mostly, I was taken by the place. To me, in those early years, it was just a cool place to be.

And then, over the years, you start doing more research, you learn a couple things, you find out a couple little things. You know, like, okay, there are buses on the glacier. Okay. They're alright, huh? [the whole group laughs.] Well, okay, but the question is, do they have an impact? And you realize that, okay, on a small scale, they do have an impact, they're definitely not helping the glacier. But are they impacting the overall health of the region? ... And then, okay, on the other hand, they are giving people the opportunity to get out there, who otherwise could not get out there. So, that's one thing.

And then you find out, ahhh! The fish in Bow Lake have high levels organochlorides from pesticides. And you think: Well where does this come from?! You find out that most of them have come all the way from Asia and have actually been here for a while. And it seems that the tentacles spread a little bit. And then the birds – the Osprey that feed on the fish – have higher levels still. So, we tend to start drawing all these little connections that always seem to make their way back to this place.

And then, you get into a topic like climate change, and you begin to realize how intimately connected a place like the Columbia Icefield is to everywhere else. And that is what brought it home to me. So now, I'm trying to share this with people: 'This place, okay, you may have come all the way here from Houston, Texas – but, hey, it has implications for all of us.'

So, I went from the snowflake to the globe. That's what ecological integrity means to me. It's about that web. (FG1)

Paul's description of ecological integrity wove all five major study themes together into one holistic view of ecological integrity, based as much on intellectual knowledge as his own personal experiences of place. First, Paul explained that coming to appreciate the concept of ecological integrity started with a personal connection to *place*. In this case, his personal fascination with the Columbia Icefield facilitated a connection with place that fostered a curiosity to learn more about the region he had come to value through recreational use. Over time, Paul pointed out that he began to learn about the biological relationships at play in the area, in addition to noticing how human activities (both inside and outside the park) played a role in the overall *health* of the region. With examples such as buses on the Athabasca Glacier, contaminated fish in Bow Lake, and finally, to a large process like climate change, Paul's personal accounts demonstrate his recognition of the *transboundary* principle. Furthermore, Paul drew out the connections *between people and place* by focusing on human activities both inside the park (riding a bus) and at home (even if home was Houston, Texas.) Finally, while Paul didn't speak explicitly about the relative importance of *change* to the notion of ecological integrity in the above excerpt, he later addressed it this way:

So, you still have those people who say that climate change isn't happening and they'll mention something about how the landscape has been changing here for millions of years, so this is no different. But this is actually the perfect way to talk about climate change because you can talk about the scale or the rate of change, and you can talk about all the ways that people are connected to those changes in the environment, and you can ask whether this place is changing of it's own accord, or if we are having an unprecedented effect on those changes? And if so, does it matter? (FG1)

For Paul and several others, using a story such as climate change to discuss ecological integrity is seen as an opportunity to highlight the dynamic nature of places like the Icefields Parkway region, generally thought to have relatively high ecological integrity. As Paul's personal account demonstrates, stories such as these were prized for their ability to draw out a multitude of biophysical and social interconnections that had evolved over long periods of time in response to ever-changing variables.

With regards to park interpretation, the very idea of connectedness proved to be very popular amongst study participants. With this in mind, three committed environmental educators in the Mountain National Parks region, shared the following:

If we can get people thinking a little bit more ecologically, then what we've done is helped people to see that everything is somehow connected. ... When people start having these little epiphanies, that's when you know you are on track to educating people about ecological integrity. ... That's why it's so important to tell stories in a way that helps to connect all the dots for people. You have to come at it from a lot of different angles." (Hanna , Interview)

I just absolutely love when I can turn a situation around and ask someone a question that gets them thinking and realize that we're all connected to all this. Like, even if I just ask someone who comes here from Calgary where their drinking water comes from and they didn't know that it came from this glacier – that's pretty incredible. I just love that, it's makes it all worth it when you can see people having those light-bulb moments. (FG3)

As these excerpts demonstrate, participants expressed the importance of facilitating experiences that helped individuals to see, understand and appreciate the ways in which the integrity of one ecosystem was linked to innumerable other aspects of life. For at least four participants, the very act of facilitating these connections in people's hearts and minds was the single-most gratifying aspect of their interpretive work. Participant responses therefore suggest that educational experiences focused on the principle of connectedness in relation to all five study-themes were more likely to encourage an understanding of and appreciation for the protection of ecological integrity. The following section identifies the use of certain stories as one way of meeting this objective.

4.7.1 Stories that make connections

Participants in all interviews and focus groups were asked to identify stories that they thought were ideal for communicating the values of ecological integrity to park visitors. While there is no shortage of stories to tell of the Icefields Parkway region, those that were most frequently shared spoke loudly to the notion of connectedness. The

following table provides a summary of the eight most commonly suggested story topics for use in future interpretation along the Icefields Parkway, as a means of communicating the values of ecological integrity.

Table 4. A summary of stories that connect the dots

Story Subject	Participant Reasoning (not an exhaustive list)
Climate Change	<ul style="list-style-type: none"> • affecting health of the local ecosystem • local effects are visible • local effects pose significant implications for water resources outside the park boundary • ability to discuss large natural processes (climatic, geological, etc.) • ability to discuss historical ecosystem changes in comparison to current scale of change taking place • role of people in the environment as critical aspect of climate change discussion
Hydrological Apex: The Canadian Rockies as “water towers”	<ul style="list-style-type: none"> • Health of entire watershed intricately linked to the Columbia Icefield • Incredibly unique place in the world (one of the reasons the Icefields Parkway region has been designated by UNESCO as a World Heritage Site) • Large industrial projects such as Alberta’s Tar Sands are dependent upon this water source
The highway	<ul style="list-style-type: none"> • Has significant implications for the ecological integrity of the area • Interesting stories about stories about local aquatics that could be told in relation to road culverts • Highway hasn’t been there that long – easy historical perspective • Interesting cultural history behind it’s development as an economic stimulus project • The politics of highway management – weighing the costs and benefits of highway management practices and potential expansions in an open and transparent manner
Caribou	<ul style="list-style-type: none"> • Scientific studies available to help provide thought-provoking information • Herd is in danger of extinction • Issue of habitat fragmentation • Cultural significance of the caribou • Climate-change impacts significant • Local threats due to road mortalities make for easy stewardship messages
Contaminants in Bow Lake	<ul style="list-style-type: none"> • Surprising • Challenges the “wilderness myth” • Demonstrates large-scale ecosystem processes • Demonstrates link between human activities outside park boundary with ecological integrity inside park boundary

Table 4. A summary of stories that connect the dots (con't)

Grizzly Bears	<ul style="list-style-type: none"> • Keystone species connected to all biophysical parts and processes in the area • cultural value (present and past) • Charismatic species
Howes Pass	<ul style="list-style-type: none"> • Beautiful location • Interesting cultural history stories with potential to illuminate various histories (David Thompson, Kootenai, Black Foot) • ability to weave various ecological integrity observations from different perspectives (i.e., Aboriginal worldviews, women explorers, different generations of people having traveled the area, etc.)
Fire	<ul style="list-style-type: none"> • History of fire management demonstrates changes in understanding of fire in relation to ecological integrity • Lots of research and information available • Interesting cultural history around fire in the landscape (First Nations and European) • Large natural process that influences the entire ecosystem

In the process of analyzing these stories, it became obvious that their value lay in individuals' pondering the interdependence of ecological integrity and the biotic, abiotic, and sociocultural environment. To describe one example, the Hydrological Apex of North America story was identified as supporting the values of ecological integrity by virtue of its ability to encourage an exploration of the following issues: how far the water in the area flowed; how many rivers it fed; how many oceans it contributed to; how long the waters in its tributaries have remained frozen in the areas' glaciers; and what navigation on these rivers used to be like compared to now. Furthermore, exploring the breadth of life dependent upon those waters, and the breadth of ways people utilized the watersheds were upheld as key aspects of this overarching story.

In this example, and the others listed in the table above, stories for ecological integrity appear to generate meaning, value, and merit by virtue of their ability to illustrate the ways in which one place, process, person or thing connects up with innumerable other aspects of life. In other words, the principle message here is that by focusing on just one story in detail, an exploration of diverse questions and other subject material is made possible, thereby illustrating the complexity, variability, and intertwined nature of the ecological integrity concept.

4.7.2 Challenges to connective interpretation along the Icefields Parkway

Often times, participants identified the element of connectedness within ecological integrity through the current challenges to interpretation in the Mountain National Parks. The following two excerpts illustrate:

Well, if we were really talking about ecological integrity up there on the parkway we would talk about things that, right now, we're not really even allowed to. Like climate change, for example. I mean, how can you possibly think that you're providing education to help improve the ecological integrity of the area when you don't ask people to think about climate change, let alone try and get people to understand the whole thing. (Stephen, interview)

I really like to talk about water up there. You know, like the Icefields Parkway is a World Heritage Site, in part, because it's the hydrological apex. I bet most people don't even know that. ... [T]he water resources that flow from this area flow out to three oceans! Like, this is really profound stuff. ... But you know what? The glaciers that are melting here are full of pesticides. Get that? Let's talk about water quality now. Parks definitely won't talk about that stuff enough up here, which is too bad, because if we did, maybe people would really start to understand just how connected the whole system is. To me, that's what ecological integrity is all about. Isn't it? (Cathy, FG3)

As these excerpts illustrate, the bulk of interpretation along the Icefields Parkway did not incorporate the stories identified in Table 4 in any depth. The majority of participants were dissatisfied with the level that stories integrated connections between people and place. Participants felt that by avoiding big issues such as climate change, opportunities to discuss connectivity in climatic, geological, biological, social, and even economic contexts were lost. It should be mentioned that at the time of fieldwork, a number of participants mentioned that they were not allowed to discuss climate change with visitors, much less take a stand on the subject. Although at least one interpretive program addressing the issue of climate change was taking place within the Lake Louise district, the interpreter in charge of this program was reluctant to speak me. When she declined to be interviewed, she indicated that she didn't want to attract unneeded

attention to her program. However, after contacting the chief communications officer for the Mountain National Parks with questions about the climate change issue, the response given was that no clear statements had been made to park communication and interpretive staff about climate change. Regardless of whether front-line educators, interpreters were able to discuss climate change with visitors, or not, there was a sense amongst participants that potentially controversial issues with far-reaching messaging potential were to be avoided.

Participants also highlighted a lack of flow or “connectedness” of interpretive signage as a further limitation. The following excerpt from a communications specialist with Parks Canada captures the issue well:

One of the things that we've noticed about the interpretive panels up on the parkway, besides how old and outdated they are, is that there just isn't any flow to them. You know, like we just re-did the interpretive stuff along the Bow Valley Parkway and, I think, did a really good job. ... Up on the parkway there's no flow at all, especially between the Banff and Jasper side of things. People don't really know that there are two totally different parks up there. So to them, it just seems weird. ... Right now, it mostly just identifies certain things that you find in each location that might be interesting, and each location has nothing to do with the next place that people might stop off at. ... So, the whole place is just really disconnected that way. (Sonia, interview)

Study findings suggest that the Icefields Parkway lacked an over-arching interpretive strategy, guiding theme, or storyline with which to provide fluidity and cohesiveness to educational experiences. Field observations concurred with participant comments that although interpretation was frequent and accessible in some locations, it was poorly planned. Not only were individual panels and other permanent interpretive media provided by Parks Canada conceptually and physically disconnected from one another, but also the educational experiences from independent tour operators were similarly disconnected. In this light, the current state of interpretation along the Icefields Parkway may be described as a patchwork of educational opportunities. In one particularly informative interview with Stephen he addressed the issue this way:

We need to have a larger concept here, not just, 'okay, you are entering Banff National Park, or Radium, or Golden' – or whatever. I think we need to move

away from the fragmentation of interpretation based on individual parks and areas. I think we really need to use the Central Rockies ecosystem and the other larger ecosystem concepts, including notions of connectivity. All those things are really important... But, when we're causing ecosystem disturbances, and we're dissecting and fragmenting the landscape, then that's when we really lose the connectivity; and if we lose that, then eventually we lose it all. All these connections are the single most important natural, biological adaptation to help mitigate the climate change impacts we are creating, and Parks interpretation doesn't even talk about it very much, let alone actively support initiatives meant to conserve it... And right now, we have diminished the parkway by saying, "okay, now you go and look at the Peyto Glacier, and you go to Waterfowl Lake, you go and look at the Athabasca Glacier and you stop at Sunwapta Falls". All of it is great and it's overwhelming for visitors, but it is far more than those individual sites being connected by a road, it is something absolutely monumental – not just in landscape, but in human psyche and I think that we need to work on being able to translate that so that people can see and find a language to be able to talk about this monumental place. ... (Stephen, interview)

Amongst Stephen's numerous important points, was the significance of recognizing connectedness as an essential component of understanding ecological integrity. It flows logically that if visitors are to have experiences of the Icefields Parkway that reflect this value, the interpretative approach requires an interconnected experience. This would be in stark contrast to the current state of interpretation, whereby each educational opportunity exists discrete from the other. A connected interpretive approach would aim to connect the dots between what was learned in one location with that of another. Consequently, the educational experiences along the Icefields Parkway would form a continuous narrative telling of the values of ecological integrity.

4.8 Barriers to implementation

Existing barriers to implementation limit the number of educational experiences along the Icefields Parkway that satisfy all the values of ecological integrity. Many of the comments made by participants illustrate some of the barriers to communication. Barriers are as wide-ranging as they are complex. Issues such as a dwindling "Parks presence," lack of organizational support, and a patchy dissemination of information are highlighted here.

4.8.1 *Very little “Parks presence” along the Icefields Parkway*

As previously discussed, there was very little personal interpretation by Parks Canada observed along the Icefields Parkway. The *only* face-to-face interpretation provided by Parks Canada in the area came from a few rove programs⁸ based out of Banff, Lake Louise and Jasper. In these programs park interpreters occasionally traveled to the Icefields Parkway region to engage visitors in a discussion focused on a specific set of educational messages that dealt with topics such as the Mountain Pine Beetle (forest health and fire programs), or bear safety (and the associated ecology of bears, bear habitat, etc.) These programs have improved the ability to bring interpretation to target audiences (rather than hoping that visitors would just find them). Yet, most participants did not believe that these rove programs provided enough of a “parks presence” for the thousands of individuals traveling the Icefields Parkway region year. One mountain guide had this to say on the subject:

Where I have been working [at the toe of the Athabasca glacier], for the last ... three months now, I have never, not even once, seen a Park Interpreter. Actually, I don't think that I've seen a Parks Canada interpreter anywhere up here on the Parkway. (Interview: Stephanie.)

Field observations made in the area echo Stephanie's opinion, that running into Parks Canada interpreters on the Icefields Parkway was rare. During the time spent cycling the area, no campground staff, park interpreters, or any other Parks Canada personnel interacting with the public were seen outside the Columbia Icefield Centre. In comparison, the number of independently operating tour guides, hiking guides, mountain guides, and bus drivers were abundant.

⁸ An interpretive rove program is a relatively recent mobile interpretive program designed so that interpreters can target potential audiences where they are geographically, as opposed to traditional interpretive programs aimed at attracting audiences to a particular and pre-defined location.

The disparity between the presence of private and public interpreters, raises additional questions of monitoring and regulation. All tourist operations had to meet legal obligations set out by Parks Canada before offering their services in the area. However, the level of monitoring associated with the educational activities of tourism operators (and their employees) appeared to be low and inconsistently regulated and enforced. Catherine, a communications employee with Parks Canada, had this to say on the subject:

*When we shut down the interpretive programs up in the parkway, just like everywhere else, the private operators moved right in. And it's good that they did because they were filling a void that needed to be filled. ... It's hard for us to tell which messages are being communicated to park visitors and which ones aren't. ... So, this is a bit of a problem, especially with the step-on guides⁹ because they're not regulated at all. ... [H]alf of the step-on guides aren't from here and they might not have any training...that's specific to this area...At least with the local tour groups and the hiking guides and stuff we have MPHIA now, ...but with the step-on guides, they're not required to get any of that certification.
(interview)*

Here, Catherine highlights the lack of monitoring and influence by Parks Canada over interpretation taking place in the Icefields Parkway. While some quality assurance was provided by the fact that hiking guides and interpreters were required to have Mountain Parks Heritage and Interpretation Association (MPHIA)¹⁰ certification as a part of their licensing agreement,¹¹ the interpretation provided by step-on guides aboard large coaches and unmarked vans was otherwise totally unknown. At the time of fieldwork, the licensing requirements of step-on guides fell under the jurisdiction of motor vehicles licensing, which did not in any way regulate (or even attempt to monitor) on-board interpretive services. Step-on guides were exempt from having to meet MPHIA accreditation requirements – the *only* method of monitoring the quality of third-party interpretation taking place in the region. In the case of the Icefields Parkway, this is

⁹ A “step-on guide” refers to guides hired to provide interpretation a motorized tour.

¹⁰ The Mountain Parks and Heritage Interpretive Association (MPHIA) has since been renamed as the Interpretive Guides Association (IGA).

¹¹ It was not necessarily the case that every guide and interpreter had gone through MPHIA training. In the case of larger tour companies such as Discover Banff only a portion of guides were required to be certified.

particularly significant, since it is likely that the interpretation provided by step-on guides served the vast majority of visitors exposed to personal interpretation.

4.8.2 An interpretive service that has “lost its guts”

Participants from different stakeholder groups frequently expressed grief over cuts to the Parks Canada interpretive initiatives once active along the Icefields Parkway. In the following excerpt, a long-time park warden reflects on this loss:

I know all I know about the Icefield Parkway, or the Rocky Mountains for that matter, from Park interpreters. ... When I first started here... there were four people dispensing information up there all the time. They were a fiery bunch, I'll tell you. And if they had an issue they wanted to target they went at it! ... [They used to do] guided hikes, campfire talks, theatre presentations. None of that exists anymore. So, we have dropped the ball on interpretation. I hate to say it, but it seems as though Parks interpretation just doesn't have any guts anymore... I find it pretty sad actually. (FG2)

As evidenced by this excerpt and many others like it, nostalgia for “*the good old days*” (Brian, interview) prior to government cutbacks associated with the ETO¹² process in the early ‘90s, figured prominently in participant discussions. Participants often referred to past services as being both better equipped, and being less forgiving in their overall approach to addressing pertinent ecological issues. Participants would often lament the freedom a larger interpretative program afforded them. Previously participants were able to talk openly about pertinent ecological issues. One interpreter in the area shared this thought: “*I just really miss the days when we were allowed to just tell the truth instead of always having to spin a story in a certain way*” (Krista, FG1).

In many study discussions, participants suggested the current educational strategy was in itself a barrier to communicating the values of ecological integrity. Current educational strategies were more about “*sell[ing] visitors an entertaining story*” (Dean,

¹² Employee Takeover Process (ETO): a market based initiative launched in 1993 whereby current employees of the park had to enter into a process of bidding for their own “businesses” against private contractors who sought to provide the same services (LeRoy, Sylvia 2004).

interview), as opposed to “*just sticking to our educational goals about helping people understand how incredibly special and fragile and, ultimately, threatened the ecology of these places really are*” (ibid). Similarly, a long-time Parks Canada interpreter expressed great frustration over the idea that “*interpretive messages in the park ... [had been] sold out to keep the commercial sector happy*” (interview, Rachel). Comments like these were common, and indicated that that participants were often disappointed and personally discouraged by a lack of investment by Parks Canada in interpreting issues addressing ecological integrity in the Icefields Parkway region.

Climate change presented the most striking example of participants calling for a revived, open and assertive interpretive approach to communicating the values of ecological integrity. Stephen had this to say on the subject:

Parks Canada can't even put “climate” and “change” together in a sentence. Public Policy from head office does not permit them to speak about climate change. ... [How] can Parks Canada talk about ecological integrity when climate change impacts are one of the greatest threats to that whole notion of how we are going to manage these ecosystems in the future? ... Ideally, Parks Canada would be the ones to talk about this, but right now that's just not the reality. ... I know that there are individuals trying to do it ... but they're having to talk about this stuff without the support from the Park. (interview)

As this example illustrates, many participants were frustrated that Parks Canada no longer appeared to support an honest, accurate and direct interpretive service that supported the values of ecological integrity. Notably, individuals who worked both inside and outside of the Parks Canada organization saw this as an issue. Paul, a local guide and past Parks Canada interpreter, shared this story with focus group participants:

I wanted to show some environmental films at the Icefield Centre, some of which included the Inconvenient Truth, and, Who Killed the Electric Car? ... But I got shut down because there were people at the Icefield Centre who didn't believe that this was their mandate to show something like that. ... I don't know? I think that Parks should be more behind that kind of stuff and they really aren't... We're not even allowed to be critical thinkers anymore. I mean, this would have been a way to help train all the staff who live up there, but it was just shut down. (FG3)

Stories like this one illustrate the degree to which participants expressed being challenged by the lack of support from Parks Canada. When discouraged from discussing pressing issues such as climate change, participants began questioning their role as interpreters of ecological integrity. While research questions were carefully posed so as to avoid repetitive negative sentiment towards Parks Canada, stories such as those above were common. It is therefore assumed that this is a direct result of the high degree of frustration, disempowerment and disillusion many educators in the area felt.

4.8.3 Patchy dissemination of information

Access to resources useful for communicating ecological integrity was found to be highly variable. Participants were left to do their own research, selecting from a combination of resources such as information they had learned from other interpreters, Parks Canada's public research updates (held in Banff each spring), internet searches, MPHIA's newsletters, internal Parks Canada email updates, or the Parks Canada Library. While educators listed a variety of useful resources, no single commonly recognized information source was identified.

Participants' responses indicated that breadth of knowledge was dependent on interpersonal relationships and association membership. For example, while everyone within the Mountain National Parks had access to the majority of Parks Canada's library sources, only five individuals from the third-party interpretive sector were aware of this resource. Individuals with personal ties with the agency demonstrated a higher awareness of where to find valuable information, such as up-to-date ecological integrity monitoring results, interesting independent ecosystem science projects, or socio-political study results.

Knowledge and communication of research was also seen as a critical aspect of fostering ecological integrity. However, participants stressed challenges of communicating investigations and findings of research taking place in the Mountain National Parks. In the following excerpt, Brian, clarified this point:

The public has a right to know what was found out and that is the job of those of us who deal with the public – to have access to that knowledge and those studies. ... Parks Canada has an email network that is pretty good where they can send out updates, but if you're not on that network, then you can be really out of touch. ... If I were in charge of this program, I would routinely send out Pdf files of every study that is being done in the park to any of us who are involved in doing interpretation because it is just going to improve our knowledge base. They don't do that. ... As Park interpreters, ... we can understand a lot of what is in these studies just because of our acquaintance of what goes on here. A lot of us are even academically qualified to interpret them. But again, if ... you're working for one of the private companies, you might not have the qualifications to interpret these studies. ... So, what we need is something ... right on the website of Jasper National Park available to everyone ... [with] a tab that says "ecological integrity," with the findings of these studies presented to the public in ways that they can understand them. And this would be a resource to all the other interpreters, too. ... So, instead of having to look at a huge document with a whole bunch of numbers and a whole bunch of really complex and foreign scientific language, we would have summaries of studies [that say] things like "We are 40 years from extinction of the Wooded Caribou in this Park." ... (interview)

In this excerpt, Brian illustrates what many other participants pointed out about the challenges of communicating research. Issues include trying to figure out what studies were going on, where the study results could be obtained, and how to actually interpret study results that were often presented in a complex and specialized language. While participants recognized that much of this information was out there, not everyone knew where to find it. Moreover, navigating the Parks Canada Agency website was identified as being cumbersome and frustrating to the point that some participants chose to search for interpretive material elsewhere. While collecting detailed suggestions such as these was not the focus of this study, findings indicate that front-line educators, interpreters and communications employees (in both the private and public sector) would serve as excellent resources to improve the dissemination of educational and communications-based information.

CHAPTER 5 DISCUSSION

The management of Canadian parks is shifting to the idea of an “integrated mandate” in which “parks are for people.” At the same time, ecological integrity has maintained its legal status as the top priority in park planning. Changes in ecological integrity discourse indicate that there is rising support for more pluralistic approaches to park management. Yet it is unclear how recent conceptions of ecological integrity and approaches to park education and visitor experience should evolve to reflect these changes. Despite this lack of clarity, detailed conversations with professionals on the front lines of communicating the values of ecological integrity to the public reveal potential directions. In this final chapter, study findings are discussed within the context of major themes from the literature, and suggestions for the future direction of park education are provided.

5.1 Shifting emphasis in park management

In the context of Canadian national parks, three areas of focus shape the current Agency mandate: ecological integrity, visitor experience, and education (PCA 2000a). According to organizational planning documents, these three components work together in a way that is meant to mutually benefit them all (Rettie 2006; Mose & Weixlbaumer 2006; PCA 2007b). Accompanying this relatively new management paradigm, an agency-wide restructuring is currently underway. This restructuring places increased emphasis on the idea of “engaging Canadians” in an effort to bolster the “relevancy” of Canadian national parks in the eyes of the public. In this context, visitor experience is projected to receive increased organizational attention, funding, and programming development. Indeed, this process has already begun. However, the links between ecological integrity and visitor experience are historically tenuous, and the notion of education for the protection and appreciation of ecological integrity is vaguely defined. Currently, there is a decided lack of direction given over what it means to deliver park education and provide visitors with experiences that contribute to the appreciation, protection, and enhancement of ecological integrity. In this context, it is therefore

important to identify suitable goals and objectives for park education and visitor experiences that honour current concepts of ecological integrity, lest the associated stewardship messages get lost in the shuffle.

5.2 The Icefields Parkway: a need for integrated education and visitor experience planning

This research took place in the Icefields Parkway region, in part because it has been identified as a future “flagship” for showcasing Parks Canada’s integrated mandate. Members of the Icefields Parkway Planning Committee indicate that the upcoming management directives for the region will be generated by way of stakeholder consultation (Rettie 2006; PCA 2007c). The planning group has stated that they will “adopt an integrated approach to ecological integrity, cultural resources, education, and visitor experiences along the parkway” (PCA 2009a: 2). While a wide variety of stakeholders are currently engaged in consultations, it does not appear that the consultation process aims to examine *how* current ecological integrity values might be better incorporated *into* visitor experiences (PCA 2009a). Furthermore, the following statement made by the planning committee reflects that the distinction between visitor experience and ecological integrity management directions have been maintained. “Because ecological concerns in the study area are relatively modest, the strategic concept [guiding the committee’s planning initiative] focuses on enhancing the experience of visitors” (PCA 2009a: 2). In this context, relatively low ecological concerns in the Icefields Parkway region have resulted in a prioritization of visitor experience objectives, and a relative dismissal of ecological integrity objectives – rather than an integrated approach to addressing the two. In this regard, it appears that an “integrated approach” to park planning is still not being embraced.

5.3 Feedback from the people on the front-lines of park education

In this research, the relationship between current ecological integrity discourse in the literature and the Parks Canada Agency's parallel operations of park education and visitor experience was explored by gathering thoughts and opinions about ecological integrity messaging in educational initiatives along the Icefields Parkway. Front-line educators, guides, interpreters and communications personal active in the Icefields Parkway region shared their insights on what ecological integrity meant to them in the context of their work. Generally speaking, participants' ideas on ecological integrity and park education supported the need for an educational approach quite different from the standard interpretive model characteristic of the Mountain National Parks. This next section discusses study findings and compares these findings with emergent themes from the literature. The significance of subjectivity (values) in relation to ecological integrity is first discussed, followed by a discussion of six themes identified in the study results.

5.3.1 Ecological integrity as a social value

Participants of this study demonstrated an understanding of ecological integrity that was both biophysical and scientific in nature, while at the same time understanding the concept to be explicitly value-laden. Passionate discussions about ecological integrity were almost always moralistic, political, emotional, or otherwise highly value-based. When asked what ecological integrity meant to them, several participants were quick to point out that this was a human-made construct representing how people relate to, understand, and choose to live in their natural surroundings. Participant conceptions of ecological integrity that purport the integration of human values and ecological (biophysical) realities also supported the need for a participatory decision-making process. Overwhelmingly, the participants in this study supported an ecological integrity discourse that was pluralistic in character. Interestingly, participants' pluralistic views on ecological integrity appear to be at odds with the Parks Canada Agency's comparatively normative definition of the concept.

While interpretive programming still embraces the need to be entertaining and creative in its approach, participants indicated that standard interpretation appeared to shy away from transformative, value-based approaches to teaching about ecological integrity. Dominant approaches to ecological integrity education in the Mountain National Parks have focused on the instrumental and technical aspects of controlling visitor behaviour (McCool & Stankey 2003; Ablett & Dyer 2009). However, implicit in the dialogue of how study participants came to personally respect and uphold the values of ecological integrity was a broader conceptualization of park education than standard interpretive models provide. This is illustrated in the following six study themes: *health & wholeness*, *sense of place*, *transboundary*, *role of people in nature*, *change*, and *connectedness*. Each of these study themes will be discussed in turn.

5.3.2 Health & wholeness

On a conceptual level, participant ideas of health and wholeness included the following four aspects of participant's conceptions of ecological integrity: (1) biophysical health and wholeness is demonstrated by the well-functioning of ecosystem parts and processes; (2) people's physical health is intricately linked to the relative health and wholeness of the natural environment in which people live; (3) emotional connections with healthy ecosystems help people to *feel* a greater sense of wholeness in themselves and the world; and (4) an understanding of ecological integrity requires people to *think* about personal and ecological health holistically. These findings imply that when participants were asked to describe what ecological integrity meant to *them*, the most popular responses echoed Nielson's (1999) definition of ecosystem health as the capacity for maintaining biological and social organization in conjunction with the ability to achieve reasonable and sustainable human goals.

With regards to education, participants identified the vocabulary of "health," "wholeness" and "ecosystem health" as being more intuitive and personally relevant communication tools than the vocabulary of ecological integrity. Additionally, the concept of ecosystem health appealed to participants since it more explicitly emphasized the capacity of systems to maintain the function of biological *and* social components

alongside the ability to achieve sustainable human goals. The focus paid to biological and social organization echo Rapport, Costanza & McMichael's definition of ecosystem health (1999).

A conceptual link may be made between participants' preference for the vocabulary of "health" over "scientific terms like ecological integrity" (Daniel, interview), and the interrelated goals of environmental education and sustainable development. Justifications citing the need for increased levels of environmental education lie in a number of factors, many of which are linked directly to the issue of human and environmental health (United Nations Millennium Ecosystem Assessment 2005; NAAEE 2002). An additional example lies within the non-governmental sphere in Canada. In this case, the goals of environmental education have been linked explicitly to sustainable community development goals that address all of the following issues: environmental, social justice, peace, international sovereignty, and *health* (CEGN 2006).

However, it is important to note that participant's preference for the vocabulary of health as an educational tool is not synonymous for the sum of values participants placed on the ecological integrity concept. Certainly, some individuals conceded that the ecological integrity held larger meaning than health. This was illustrated by one participant's example that a city park was capable of being healthy, but was by no means a representative of a natural region. Despite an emphasis on the utility of using the vocabulary of health in park education, participants still emphasized the importance of other supporting aspects of ecological integrity, such as abiotic components, ecosystem processes and biodiversity. Participants' valuing of these biophysical aspects in the park's definition of ecological integrity is evident in other study themes (as demonstrated in the following section).

Moreover, the biophysical elements of the health and wholeness principles discussed posit themselves as significant elements of standard park interpretation. This relatively normative focus is largely consistent with the way ecological integrity directives have been defined within the Parks Canada Agency. However, participants indicate that the third and fourth pluralistic aspects of this theme (see first paragraph of this section) are needed. While illuminating the interesting aspects of ecosystem health, wholeness and integrity is often done in an entertaining way, a more pluralistic

interpretive approach would assist visitors to *feel* a sense of wholeness *in themselves*, and, teach visitors how to *think* more holistically. The Parks Canada Agency's lack of support for these sort of educational goals sets it apart from other more pluralistic interpretive models such as the Australian Association for Interpretation (2005), whose primary objective is to help people understand more about *themselves* in relation to the natural environment. If the Parks Canada Agency wishes to implement a more pluralistic management approach to ecological integrity, incorporating the more personal aspects of health and wholeness into ecological integrity education would be one way of doing so.

5.3.3 *A sense of place*

The importance of “place” in relation to ecological integrity exemplified the idea that not just any green space was capable of fostering respect for ecological integrity. For example, it was suggested that time spent in a city park was unlikely to provide people with “that same feeling of wholeness ... you can get in some of those really special places we have here in the park” (Krista, FG1.) In light of the high levels of biodiversity, and presence of most abiotic and ecosystem processes native to the area, the Icefields Parkway was celebrated by participants for being an ideal location for ecological integrity education. Participants emphasized that people were more likely to build respect for, and relationships with, landscapes with integrity if they had the chance to have intimate experiences in these places.

Suggestions for education grounded in place included the need for intimate, hands-on, sense-surrounding experiences in the Icefields Parkway region. The need was identified to facilitate experiences that encouraged visitors to overcome a “glass window” experience of the park so that visitors see and remember more than just pretty pictures. Educational tools identified by participants included improving park infrastructure such as better trail networks and picnic sites that encouraged visitors to get out of their cars and away from crowds. Examples such as this are evidenced by participants' support for an educational approach that was experiential, mindful, multi-sensory, and respectful of visitor agency. There were four distinct aspects of participants' emphasis on place.

First, developing a sense of place comes about as a result of personal reflections born out of a combination of experiences. These experiences are likely very diverse and include such things as a moderated discussion, a guided walk through natural landscapes, the visitor's exposure to park infrastructure, a candid conversation with a park warden, a self-guided wander through a meadow, and the experience associated with stopping for lunch in a restaurant. All these experiences, together, form visitors' experiences of the park, and all are possible educational opportunities for ecological integrity. However, without thoughtful reflection, their collective potential to turn park experiences into educational opportunities grounded in place can be lost.

Second, this means that an interpreter's role should be to encourage visitors to *reflect* on their experiences of place, and their own relationship to their surrounding environment. On numerous occasions, it was suggested that the best reflection time takes place in moments of solitude when "information about ecological integrity can come to life" (Mike, FG1). Crowding, and a failure to spread out visitation patterns along the Icefields Parkway, was cited as major barriers to providing visitors with "that rare and powerful sense of solitude that you can get in big landscapes ... with ecological integrity" (Natasha, FG2).

Third, interpretation for ecological integrity belongs equally to visitors as it does to the interpretive specialist (an idea supported by Uzzell, 1998; and Ablett & Dyer 2009.) In this sense, the example provided by some participants that the "mountains will teach you if you let them" (Daniel, interview) requires that educational frameworks aim to facilitate experiences in those places as intimate and personal as possible. Furthermore, interpretation should ask "tough questions" (Paul, FG1) to get visitors critically engaged in the stories of place. From this perspective, it was not the job of interpreters and educators to provide all the answers; rather, learning about ecological integrity was a collaborative effort. In this sense, the roles taken up by interpreters and educators paralleled the perceived role of scientists from an ecosystemic-pluralistic point of view as "narrator" and "facilitator" (Manuel-Navarrete et al. 2004: 223).

Finally, another integral part of connecting with place identified by study participants was through individuals who, themselves, felt a strong affinity for, and

connection to, place. These people were described as the “story-tellers of place” and were valued as social-doorways to the ecological heritage of places like the Icefields Parkway.

Explicit in the “sense of place” theme were subjective conceptions of ecological integrity that were integrated meaningfully into ideas of personal growth, social organization and human-environment interactions – all of which comprise the main objectives associated with the transpersonal-collaborative ecological integrity discourse (Manuel-Navarrete et al. 2004). However, these goals don’t appear consistent with “environmental interpretation” whose main purpose is to translate technical scientific information and language into terms that the layperson can readily understand (Ham 1992). Although the goal of classically-defined environmental interpretation includes the need to make this translation entertaining and interesting, the experiential element of learning is not itself an integral part of the concepts being interpreted.

In contrast, the value of personal experiences in nature is an integral part of most environmental education frameworks. Direct, hands-on environmental experiences are thought to develop environmental sensitivity (Hungerford & Volk 1990), and environmental awareness (Ballantyne & Packer 2002). Interestingly, environmental education scholars have also reinforced that an appreciation for the natural world gained through personal exposure to it, is positively correlated with self-confidence and self-esteem (Palmer & Neal 1994). The attention paid to personal growth in environmental education compares well with the transpersonal-collaborative worldview, whose main objective of ecological integrity is “to integrate, meaningfully, personal growth, social organization and human-environmental interactions” (Manuel-Navarrete et al. 2004: 223).

In addition, the value of having role models that were themselves personally connected to place was observed in both study data and environmental education literature. For participants, it was very important to have role models in the park who were connected to the local environment by virtue of their time spent in it, and their depth of personal knowledge of, love for, and efforts to protect the area. Within environmental education literature, the importance of role-modeling posits itself as an integral part of many environmental education frameworks (Hungerford & Volk 1990; Chawla 1999; Van Matre 1999). The parallel message is that guides, educators, interpreters or any other

individuals in uniforms, stand as examples of local culture and role models for environmentally sensitive behaviour.

Education, it was therefore suggested, should aim to illuminate these three aspects of ecological integrity in a way that aims to help visitors develop a sense of place. Suggestions for education grounded in place included the need for intimate, hands-on, sense-surrounding experiences in the Icefields Parkway region. The need to facilitate experiences that encouraged visitors to overcome a “glass window” experience of the park so that visitors see and remember more than just pretty pictures was identified.

Within this theme, a pluralistic view of ecological integrity is evident and contrasts with standard management directives as they relate to educational infrastructure and programming currently in the Icefields Parkway region. Again, if the Parks Canada Agency is serious about implementing an integrated mandate, the suggestions made by participants with regards to fostering a sense of place could help in reaching this goal.

5.3.4 Transboundary

The transboundary theme signifies participants’ framing of ecological integrity as if it should be part of a larger effort to encourage sustainable living on the earth. While fostering intimate and personal experiences in magnificent places like the Icefields Parkway were incredibly significant to participants, their conception of ecological integrity extended well beyond the political park boundaries lines. The idea that “parks aren’t islands - you can’t protect ecological integrity in isolation from the outside world” (Paul. FG1) presented itself throughout study data and greatly influenced the way participants’ valued ecological integrity. In this regard, ecological, political, economic, and cultural factors were cited in participant discussions as having an effect on, and being affected by, ecosystem integrity.

From an ecological point of view, participants emphasized the importance of natural processes in determining the integrity of an ecosystem. The idea that natural processes, both large and small, crisscross political boundaries unwittingly contributed to the transboundary theme. Of even greater importance, however, were their rising awareness of issues such as climate change and their perceived links to natural processes

operating on a global scale. In large part, participants expressed concern that these were overlooked in current ecological integrity frameworks and educational approaches in the park.

From a sociocultural and sociopolitical point of view, perceived links between the way people choose to live their lives with regards to their activities while in and outside park boundaries was identified as having implications for ecological integrity, and vice versa. In this regard, even supposedly pristine places were capable of being influenced by, and having influence on, people's social lives. Again, examples such as climate change appeared to push this transboundary theme, in addition to concepts like ecosystem services, and the cultural and political significance of the United Nations having designated the mountain parks as a World Heritage Site in light of its vast ecological value.

Ecological integrity was therefore viewed as an all-encompassing concept with applications that extended beyond a protected areas context (although protected areas were upheld as ideal locations in which to exercise these ideas.) Some participants criticized normative ecological integrity narratives for framing park ecosystems and cultural practices as distinct or isolated from the outside world, thus never facing the underlying social issues threatening the capacity of ecosystems to maintain their health and integrity (such as rampant consumerism or a booming fossil-fuel industry). Collectively, these views of ecological integrity are distinctly pluralistic in character.

The implications for education based on these insights included suggestions that interpretation along the Icefields Parkway needed to do a better job of communicating the significance of natural processes in determining the relative integrity of ecosystems. Increased attention paid to stories, such as the mountains are "water towers," were suggested as a means of better illustrating how processes like hydrological cycles link the Icefields Parkway to varying local, regional and global contexts. In addition, it was suggested that stories such as these could help current park education to do a better job of demonstrating how people influenced and depended upon these processes.

Additionally, participants were especially critical of standard park education for being too focused on communicating "rules" than they were about helping people to understand what it really meant to protect ecological integrity. It is likely that this is a

reaction to the narrow management-based focus of interpretation. In this light, numerous participants suggested that stewardship messages needed to include more than just rules of what not to do while visiting the Icefields Parkway, and focus more broadly on action-oriented goals that extend to people's everyday activities.

Within environmental education narratives, it is assumed that issues concerning the environment are of local, regional and global relevance (UNESCO 1978). From this standpoint, participants' suggestions that stewardship messages for ecological integrity need not be limited to park settings, corresponds with the goals of environmental education to effect positive environmental action. Scholars of environmental education have differentiated between positive environmental action and positive environmental behaviour on the basis that behaviours do not necessarily require individuals to have certain knowledge or attitudes, whereas actions do (Emmons 1997, Jensen 2002). While current approaches to park environmental interpretation appear to focus on environmental behaviour (i.e., don't feed the wildlife), it seems that to date, this differentiation between changing visitor behaviour and affecting visitor action is missing in interpretive literature.

5.3.5 The role of people in nature

Any philosophical discussion of ecological integrity inevitably leads to questions about the role of people in nature. Two schools of thought emerged in study results and are discussed here.

For a relatively small group of participants, the protection ecological integrity was synonymous with the protection of wilderness, defined by an absence of people in the landscape. For these individuals, ecosystems with integrity echoed notions of pristine nature, and the idea that protecting these places meant keeping people and their activities out of them. From this perspective, interpretative messaging paralleled normative worldviews by celebrating the idea of wilderness - its beauty, autonomy, and integrity, as a foundational value. Furthermore, education for ecological integrity (normatively defined) aimed to communicate scientific "truths" about how human activities stress the integrity of ecosystems, with relatively little attention paid to celebrating the innumerable connections between social and ecological systems.

In contrast, the majority of participants made a point to argue against the idea of ecological integrity in a “people *versus* nature” sense. This didn’t mean that the idea of wilderness, or places of wilderness, were not valuable to participants (indeed they were). Rather, the concepts of pristine and wilderness were deemphasized, and the pluralistic view that people belong to and participate *in* natural systems was elevated. Although ecological integrity still focused on natural ecosystems, participants’ conversations implied that they considered human activities to be a part of, and result of, complex co-evolving organizational dynamics shared by social and ecological systems.

While participants still believed that science provided very valuable insights into human-nature relationships, it was thought that any application of science needed to occur in a transparent way that acknowledged the greater social values supporting its implementation. In other words, protecting ecological integrity in parks didn’t happen because science dictated that this was the correct thing to do; rather, it happened because human values indicated that this was a *desirable* thing to do. Again, this view is characteristic of a pluralistic discourse. Participants felt the need to emphasize this conceptual shift away from simple fence-and-protect ideas of park management and the idea that understanding ecological integrity is in the domain of science alone. Although, science was still seen as contributing greatly to ecological understanding, participants emphasized the need for park education to be explicit about societal values, focus on collaborative learning, and situate protected areas within their broader ecological and social context.

The implication of recognizing the role that people play *in* nature for park education is significant. Education for ecological integrity would aim to help individuals develop deeper relationships with the natural world. This stands in contrast to current environmental interpretation approaches that help people to understand more about nature in a cognitive and scientific sense, since human culture is usually treated as a case separate from nature (Staiff & Burshell 2002). Within the context of many approaches to environmental education an appreciation for the interrelationships between people and the natural world start with: (1) helping learners to understand the most basic natural functions and processes of life on earth; (2) the interrelationships between people and these functions and processes; (3) and necessarily include engendering an emotional

kinship for these living things (Van Matre 1999). In contrast to standard approaches to environmental interpretation, the role of people in nature cannot meaningfully be separated from the *process* of learning about the natural world, nor the natural world itself.

5.3.6 *Change*

Participants' articulation of a *change* theme means that it is important to understand ecosystems and people's relative role in those ecosystems within a grand sense of time. From this perspective, landscapes with integrity were incredibly dynamic and retained the freedom to evolve. Accompanying this point of view was the idea that it is not just the ecosystems themselves that are changing, but also people's understandings of them. While it is generally quite easy for a visitor to appreciate the changes that have occurred throughout human history, it was suggested that the dynamic and continuously changing nature of park ecosystems, and multiple ways of understanding and relating to these ecosystems, is not adequately communicated in current education and interpretation efforts. From this view, concerns were raised over static representations of nature in the parks, and by association, static interpretations of ecological integrity.

Related to this view was the idea that ecological integrity is itself inherently unknowable, and that education for ecological integrity should be based on the presumption that any knowledge on the subject is no more static than the systems themselves. This does not mean that current formulations of ecological knowledge are dismissed because they are always subject to change. Rather, it heightens a sense of curiosity, wonder, and respect for the complexity of these systems and reifies a commitment to continuous, life-long learning.

In contrast, the focus of standard interpretation tends to be in the delivery of positive learning experiences often limited to the present, tangible, interpretive experience being provided. Evidence of the immediate and short-timeframe of interpretive messaging is found in studies that have shown standard interpretation in the Mountain National Parks to not appeal to repeat-visitors (Morrow 2005). Moreover, standard interpretation programs are rarely designed to facilitate individual educational

experiences that, *together*, accumulate over time into an ever-evolving learning journey telling of the way people have, and continue, to understand nature (*ibid*).¹³ Conversely, implicit in environmental education's guiding principles is the idea that education should be a life-long process that encourages an ongoing development of knowledge, awareness, critical thinking, environmental ethics and values sensitive to the environment (Palmer & Neal 1994). In this regard, the principle of change seems like a logical fit for this educational paradigm.

Propelled by discussions of climate change, there were many debates over the ability of scientists to determine what rates of change were "natural" and which were "not natural" for a system to have maintained integrity. While opinions on this subject were diverse, the majority of educators stressed the importance of being explicit that decisions made about acceptable levels of change were "value judgments" (Shannon, FG3). Some participants feared that accepting the idea of "change" as an integral part of ecological integrity, led to a "slippery slope" whereby acceptable levels of change were likely to be determined by the relatively powerful commercial sector in the Mountain National Parks. And yet, numerous other participants maintained that accepting change in principle did not mean that every change was inevitable, nor acceptable. This suggests support for a pluralistic discourse that emphasizes the importance of transparency in deciding the desirability of system changes, including assessments of how decisions will be made, and by whom (Clark et al. 2008: 162).

5.3.7 Connectedness

The primary message behind the theme of connectedness was the principle that no single theme can adequately represent the full concept of ecological integrity. Only when all of the above mentioned aspects of ecological integrity are presented *together* could they possibly tell the story of ecological integrity in the Mountain National Parks and beyond. On a biological level, this included the importance of recognizing the

¹³ The EcoIntegrity Project, a four-year pilot project in Banff, stands as one exception. This project specifically targeted repeat visitors and one objective of the project was to peak enough curiosity in visitors to encourage further at home reflection of ecological integrity messaging (Morrow 2005).

innumerable ways in which the integrity of one ecosystem depends upon a matrix of biological relationships whose breadth and complexity are astonishing. On a sociocultural level, appreciating ecological integrity also meant conceding that these biological connections were linked to, and unable to be meaningfully separated from, all aspects of human life.

In many ways, the insights gathered from front-line educators mirror current criticisms of normative ecological integrity discourse commonly associated with protected areas management. “[T]he strictly ecological definitions of system integrity and simplistic, unitary goals of wilderness-normative conceptions of ecological integrity hinder effective responses to conservation problems, which are often of a polycentric and socio-political character” (Clark et al. 2008: 158). Essentially, participant responses challenged dominant Western narratives for being overly reductionist, impossibly objective, and unrealistically downplaying the role of people in nature – all of which parallel the criticisms raised by proponents of pluralistic views of ecological integrity (Callicott et al. 1999; Hermer, 2000; Manuel-Navarette et al. 2004; Clark et al. 2008).

To study participants, education for ecological integrity was about illuminating relationships. Stories identified as being ideal for this job included many of the stories already told along the Icefields Parkway that drew attention to things like Mountain Caribou, glaciers, bears, forest fires, etc. However, a difference in the breadth and focus of stories, compared to the ways most stories are currently told along the Icefields Parkway, was identified. In short, participants felt that stories told in interpretive programming could do a better job of (1) drawing out social-ecological relationships; (2) illustrating linkages between local, regional and global scales; (3) conveying the notion of change in the landscape over longer periods of time; and (4) communicating that the health and wholeness of the park environments depend on all of these things.

While there was evidence that individual interpreters and guides *did* aim to connect their interpretive messaging to broader social and ecological issues (such as climate change), many identified that these educational efforts had to be carried out “under the radar” for fear of political reaction or disapproval on the part of upper-level park officials or powerful tourism operators. Opposition to education of this kind

appeared grounded in claims that these stories were overly value-based, “broaching on advocacy,” and were therefore not suitable.

In summary, it is suggested that telling stories (or facilitating visitors to make their own stories) that illuminate the values of ecological integrity would help people to see and appreciate the ecological and social connections existent between people and place, the park and the outside world, the health and wholeness of these systems, and the changes that both sustain and threaten their existence.

Under current models, the focus of ecological integrity interpretation in the Icefields Parkway region is captured in the definition of environmental interpretation as a means of “translating the technical language of a natural science or related field into terms and ideas that people who aren’t scientists can readily understand. And it involves doing it in a way that’s entertaining and interesting to these people” (Ham 1992, 3). From within this model, interpretations of connectedness to park visitors tend to focus on ecological connections as understood through a scientific lens. Participants suggest, however, that by focusing “too narrowly on just biological connections, you can miss the whole point of teaching people about ecological integrity – which is to say there’s way more to it than just biology” (Trevor FG2). At the root of these concerns was the opinion that educational experiences that portrayed issues of ecological integrity in solely biological and value-free terms failed to encourage individuals to think about their personal connections to the natural environment they were in. Interpretation of this kind fails to get visitors thinking critically about their own worldviews, their sociopolitical environment, and their daily activities that inevitably affect, and are affected by, the ecological integrity of places like the Icefields Parkway.

In comparison, within even the most generalized environmental education frameworks, it is essential to make connections on social, spiritual, moral, technological, aesthetic, economic, political *and* ecological levels (UNESCO 1978). Similar to participant responses emphasizing the idea of connectedness, environmental education supports a wholistic, interdisciplinary approach to both understanding, and teaching, about the natural environment (Hungerford & Volk 1990; Palmer & Neal 1994; NAAEE 1999).

5.4 Implications for education along the Icefields Parkway

Much of the literature on interpretation and ecological integrity (pluralistically conceived) supports the primary themes emerging from study findings. One such example includes Butler & Hvenegaard's classification of interpretation's third phase, whereby the new focus is meant to "develop not only a concern for preservation but a different approach to life" (2002: 185). Additional examples of pluralistic models of environmental interpretation are evident in the landmark Panel Report on ecological integrity (PCA 2000). While it has been argued that this report has been built upon the basis of a normative ecological integrity legal provisions (Clark et al. 2008), many of the recommendations made for improving park education reflect more of a pluralistic view on environmental interpretation. The following are two examples.

First, recommendations called for an increased reliance on outdoor and experiential interpretation that focused on increasing an awareness and knowledge of ecological integrity (rather than just recreational and aesthetically appealing experiences). This thereby reinforces aspects of the sense of place theme, including the idea and need for a more participatory approach to park education. Second, increased attention should be paid to regional, national, and global contexts in addition to localized ones. In this example, the transboundary character of ecological integrity is reinforced.

Despite growing support in park reports for the integration of more pluralistic ecological integrity provisions into educational experiences in national parks, front-line educators who participated in this study still voiced the need for an expanded and more value-based approach to park education for ecological integrity. A collective consideration of all study themes suggests directions that the study participants would like to see emphasized in park education. They are presented as follows.

Park education for ecological integrity would provide opportunities for intimate outdoor experiences.

- Increased attention would be paid to developing visitor facilities and attractions (such as viewpoints, picnic areas and other points of interest) in a way that

encourages individuals to immerse themselves in the natural realm (i.e., small trail networks that encourage visitors to spread out in the landscape).

- An increased focus on experiential learning would aim to increase visitors' environmental sensitivity through positive contact with the natural world.

Park education for ecological integrity would rely heavily on personal interpretation to elucidate ecological and social-ecological relationships.

- Increased levels of personal interpretation facilitated by individuals with deep personal attachment to, and knowledge of, the local environment is needed.
- This service should be affordable to all visitors.

Park education for ecological integrity would be grounded within the broader ecological and social contexts on local, regional, and global scales.

Local:

- More attention would be paid to connecting individual interpretive and educational experiences to one another with the goal of creating a cohesive educational experience from one end of the Icefields Parkway to the other.
- Increased attention would be paid to the social and ecological relationships between the local communities of Jasper and Lake Louise (i.e., describing the ecosystem services provided to these communities, describing the changes observed in this landscape through the eyes of local mountaineers, engaging local school children to help teach visitors about the parks, etc.).

Regional:

- Emphasis would be placed on ensuring visitors understand that the Icefields Parkway is just one portion of Banff and Jasper National Parks, and that these parks are just one portion of a collective of Mountain National Parks, and that these parks are just one portion again of a larger, regional Rocky Mountain ecosystem, whose watersheds are larger still.

- Increased attention would be paid to conceptually situate the Icefields Parkway in the Central Rockies ecosystem (i.e., celebrate the ecological processes and functions that this region provides to outlying communities such as Calgary and Edmonton; describe the sorts everyday human activities that have influence on how these processes operate; etc.).
- Increased collaboration would occur between regional environmental education programming and the opportunities for education available within the parks.

Global:

- Increased attention would be paid to the ways in which the Icefields Parkway is connected to the rest of the world (i.e., evidence of the industrial revolution may be found in the form of particulates and pollutants within glacial ice originating from locations across the globe).
- Increased attention would be paid to UNEP’s designation of the Central Rockies system of protected areas as a World Heritage site in light of the supreme ecological value that this area holds within the context of global ecological health.

Park education for ecological integrity would be honest and transparent.

- Increased attention would be paid to what is currently known (in comparison to what used to be “known”) about the ways in which human activities inside and outside of park boundaries have an effect on, and are affected by, varying levels of ecological integrity. For example, interpretive messaging would tell the public about controversial issues, what the parks are doing to address these issues, and the values being weighed in decision-making processes. This would help the public see Parks Canada as a proactive and transparent organization.
- Interpretation would demonstrate the complexity of managing for ecological integrity. It would engage visitors in a more participatory experience by sharing some of the challenges faced by park managers, and encouraging visitors to think about these tough questions.

5.5 Obstacles to implementing a pluralistic educational approach within the Parks Canada Agency

There are a number of organizational obstacles within the Parks Canada Agency to actualizing a more pluralistic educational approach for ecological integrity in the Mountain National Parks. On a practical level, a pluralistic approach to park education implicitly suggests that Parks Canada should allocate more resources to interpreters and other educators so that the level of face-to-face engagement with the general public may be increased (with little or no fee attached to this service). The bottom line, of course, comes down to balancing financial budgets, and it is recognized that establishing a full-time and permanent team of interpreters would be costly.

The Parks Canada Agency has undergone massive organizational changes in its evolution from a public organization to its incorporation into a more business-oriented “Agency” oriented towards fiscal efficiency (LeRoy, 2004). With this in mind, it is likely that many of the methods suggested for providing a pluralistic approach to park education (such as increasing the levels of personal interpretation and the availability of intimate walking trails), are organizationally problematic because they do not *generate* significant revenue. Today, with the increase in private business involvement and the growth of the commercial sector in parks, the complexity and diversity of interests has only increased. Certainly, financial interests are particularly volatile. Additionally, the suggestion that park education for ecological integrity should be more honest and transparent in its communication of issues likely runs counter to many of the broader political and organizational pressures on the Parks Canada Agency. In particular, a pluralistic educational approach for ecological integrity would raise controversial issues that might run counter to the current policies of the Canadian government and Parks Canada, such as playing down the need for strong action to address climate change.

That participants support for the implementation of a more pluralistic education approach is likely a reaction to this complex political environment whereby a multitude of interests and values are seen to be at odds with one another. This approach would be in line with an environmental education perspective that recognizes the socio-political and economic realities of the way parks connect to larger ecological and organizational

realities. As identified in study results (i.e., Stephen, interview) and in the Panel report for ecological integrity (PCA 2000b), in order for an educational approach such as this to be embraced within the Parks Canada Agency, the financial obstacles and political pressures have to be recognized and addressed, in part through prioritizing an organizational culture commensurate with pluralistic values of ecological integrity.

5.6 Conclusion

Support for an integrated approach to park management by study participants appears grounded in many of the concerns raised by pluralistic worldviews. This view asserts the impossibility of managing for ecological integrity within the boundaries of a park solely through scientific means; maintains that managing for ecological integrity necessarily entails upholding certain social values; and challenges the efficacy of top-down management efforts as the only way of maintaining ecosystem integrity in national parks. This approach moves beyond simplistic normative approaches implicit in older park management frameworks. Like an ecosystem-pluralistic discourse, the rationale behind current conceptions of an “integrated mandate” implies an understanding that people cannot meaningfully be separated from nature. However, based on the research presented in this thesis, it is suggested that there is much work to be done before a cultural paradigm commensurate with the values of ecological integrity (no matter how it is defined) is effectively incorporated into park education and associated visitor experiences in any harmonized way.

If the intention is to integrate the organizational directives associated with ecological integrity, public education, and visitor experience with one another, a closer examination (on the part of the agency) of the linkages between these management functions is needed. One step towards reaching this goal would include addressing common (mis)interpretations of the Parks Canada Agency’s ecological integrity mandate as necessarily excluding *any* form of human activity in parks’ natural landscapes. Rather, more explicit acknowledgement of the connections existent between people and nature (whether biophysical, emotional, or spiritual) should be addressed. This should take place alongside visitor use objectives that remain responsible to the specific social values

associated with the decision to manage for ecological integrity as the primary objective within Canada's National Parks.

If a shift in park management is to embrace a truly integrated and pluralistic management approach, a participatory (rather than top-down) approach to improving park education for ecological integrity would involve speaking with individuals who are both personally invested in the protection of the environment and have experience working on the front-lines with the public. These individuals not only have expertise and valuable insights, but they also suggest valuable ways in which current interpretive and educational approaches are both constrained by current normative ecological integrity discourse and out of step with the realities of global environmental problems.

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APPENDIX A

KEY INFORMANT INTERVIEW QUESTION GUIDE

1. Can you tell me about the educational opportunities you are connected to or are informed about in the Mountain Parks?
 - Do your educational programs address the issues of ecological integrity?
2. What does the term ecological integrity mean to you?
 - Do you like the term “ecological integrity”? Why or Why not?
 - If we were to take the concept of ecological integrity seriously, what would that imply to you?
3. Do you see it as your role to communicate the values of ecological integrity to the public?
 - Do you think it is important to communicate the values of ecological integrity to the public?
4. Interpretation and education within National Parks is meant to make people aware of the values and purposes of national parks. Do you think that the values associated with ecological integrity are clear enough to do this?
5. What are the most important values associated with ecological integrity to be communicated to the public?
 - In your experience, can you tell me about the best way to communicate those values?
6. Who are the current audience members of the educational work you employ?
 - Who would you like to cater your educational efforts to in the future?
7. Interpretation and education often tries to communicate what people can do to help protect the environment at the time. Should these messages extend beyond just the Park?
 - For example, should educational efforts target people’s actions on a local level, or also include what people can do in their own homes located outside the park?
8. From your point of view, are there important environmental issues that you would like to see addressed within the educational initiatives throughout the Mountain Parks that remain outside the lens of ecological integrity?
9. Do you find the concept of ecological integrity translates well into educational objectives?
10. Are there appropriate avenues available to educators to access information generated by scientific research in the area in order to incorporate that information into your educational programming?
 - Similarly, are there appropriate avenues available to educators to access information pertaining to local and/or Aboriginal knowledge into your educational programming?

APPENDIX B

FOCUS GROUP FORMAT AND QUESTION GUIDE

I. Introduction

- Thank everyone for coming, indicate that snacks are available, etc.
- The goal of this discussion:
 - *to create a vision of what it would be like to deliver to quality educational opportunities that honoured the principles of ecological integrity.*
- Clarify the itinerary for next few hours
 - Start with a *visual exercise* where we each have the time to reflect on what 'ecological integrity' means to us
 - *Discuss with each other* what we have come up with and respond to each other's work
 - Then I have some questions aimed at the *Nuts and Bolts* of 'ecological integrity'
 - Finally, we will have a discussion on communicating the ideas associated with ecological integrity and will use the *Icefields Parkway as an example.*
- Set the '*ground rules*' for discussion
 - We are all encouraged to participate in all discussions that take place!
 - Do not be afraid to say what you truly think
 - Be respectful of other peoples thoughts, feelings and beliefs
 - Try to share the talking space so that everyone has equal chance to be heard
 - As facilitator, I will not actively participate in the discussion. My job will be to steer the discussion should we get off topic and encourage everyone to speak their minds.
- Round-table introductions – start with myself
 - Name
 - work related to environmental education / interpretation?
 - what draws you to the work you do

(TIME: 5 min)

II. Personal definitions

VISUAL exercise:

- Ask people to think about what ecological integrity means to them and try to represent that visually using various materials supplied...
- *What does 'ecological integrity' mean to you personally?*
- *Brainstorm associated ideas, values, concepts, or situations*
- If people seem stuck, provide the following additional direction:
 - *If you were to come across a state of EI, what would it look like?*

TIME: 10 min (max)

III. Debrief Visual Exercise

- **Time!** Now we have about half an hour to discuss what everyone has come up with.
- Please feel free to respond to one another as we go thru
- I will record the main ideas as you speak amongst yourselves – feel free to watch what I am writing down and let me know if I have misinterpreted anything.

- I don't want to this to feel like you are reporting back to *me* the whole time. I'd like this to serve as a tool to get you discussing the interesting aspects of your drawings with *each other*.
(TIME: 40 min)

IV. *The Intricacies of 'Ecological Integrity'*

Still using the images and emerging discussion as a tool – hone in on key concepts that either warrant further discussion or have yet to be discussed.

The following approach will apply: ask about a related concept → decide relative importance to the EI concept → find out if comes up in their programming / would like to see it used / would prefer to not use it.

1. In the context of ecological integrity – what does '*integrity*' mean to you?
2. Often times we hear the word "*wilderness*" associated with ecological integrity which often connotes an absence of humans from the landscape.
 - 3a) How important is the notion of *wilderness* to the concept of ecological integrity?
 - 3b) Is this a word you use in your interactions with visitors? Why/why not?
 - 3c) Where do *people* fit into your understanding of ecological integrity?
3. From an educational point of view – how important is it to communicate the idea that *everything is connected*?
 - 4a) Does this idea relate to your understanding of ecological integrity?
 - 4b) Is this something that we should aim to communicate to Park visitors? To What degree? (ie. how much effort?)
 - 4c) How far should this focus extend? (connections on a Local scale, regional, global)
 - 4d) Does this factor into your programming / work with park visitors?
4. Within the concept of ecological integrity, there is a delicate balance between rates of '*change*' and a state of '*stability*'
 - 5a) How important are the notions of *change* and *stability* to the concept of ecological integrity?
 - 5b) Over what *time frame* would it be best to illustrate this to visitors?
 - 5c) To what degree should we aim to communicate this idea to Park visitors? (ie. how much effort?)
 - 5d) Does this factor into your programming / work with park visitors?
5. Many people use the term '*health*' to help describe ecological integrity.
 - 6a) Is the notion of *health* an appropriate descriptor for the concept of ecological integrity when talking to park visitors? Why?
 - 6b) Does this change in instances of large wild fires, floods, or pine beetle outbreaks that are often seen as being '*unhealthy*'?
6. Some definitions of ecological integrity speak loudly to the need for a renewed *spiritual connection* to the land?
 - 7a) How important are notions of *spirituality*, or other highly personal experiences, in our understanding of ecological integrity?
 - 7b) As educators, is this an important aspect of getting people to understand the values of ecological integrity?
7. How do we *know / judge* ecological integrity?
 - 8a) Some people say that judging the Ecological integrity of an area is for biological *scientists* - do you agree?
 - 8b) Some people say that to know ecological integrity you need to have extensive *hands-on experience* in that place (do not need to be a scientist) - do you agree?

- * if scientific methods are the only way of understanding ecological integrity, then how do we get visitors to understand...?
 - 8. In your opinion, can visitors gain appreciation for the concept of ecological integrity from the highway?
 - 9a) Is so, how?
- (TIME: 30 - 40 min)

- **BREAK** -

V. Communicating the values of Ecological Integrity (in relation to above)

- 9. From the interviews I have done, it seems that many people choose not to use the actual words 'ecological integrity' when communicating associated ideas to visitors. Would you say that this is true?
 - 10a) What sort of things do you bring up in regular conversation with park visitors when you are talking about ecological integrity?
 - 10b) What things, besides dialogue or written words, do you think communicates (or helps to teach) the values of ecological integrity?
- 10. Based on our discussion so far... What are the primary principles or concepts that you would like visitors to understand before they leave the Mountain Parks? (In a perfect world...)
 - 11a) What are some of the best *ways / methods* of getting this information across? (ie. Illustrations such as ecosystem services, trails that allow people to get out and experience the landscape, etc?)
- 11. What barriers do *you* have getting these messages across?
 - (ie. Feel that visitors are not receptive to this information? Lack of supporting culture within your place of work? Programming that allows for a genuine experience with visitors is limited? Etc.)
- 12. Are there important stories to be told in the parks that fall *outside* the lens of ecological integrity?
- 13. There is a lot research taking place that relates to the ecological integrity of our Mountain Parks. As educators / guides / interpreters do you think that there are appropriate avenues available to access this information?
 - 14a) where are you getting the majority of the information you use for interpretation? (Great sources?)
 - 14b) what format do you usually find this information in? (ie., radio, scholarly reports, books, Parks Canada public lectures, etc)
 - 14c) Is Parks Canada a reliable source of this sort of information?
 - 14b) Do you have suggestions for what might help make information more accessible to you? (better avenues)

(TIME: 30 min)

VI. A Vision for the Icefields Parkway

As you all know, I have chosen the Icefields Parkway to serve as my case-study to give the conversation we have just had a more tangible application.

- 14. From your experience, what are the primary *educational opportunities* pertaining to ecological integrity along the Icefields Parkway?

- (here I am looking for actual opportunities – not issues. ie., hostels, campgrounds, bus tours, specific demographics to target, etc)
 - 15a) Which of these are we currently doing well?
 - 15b) Which of these could we do better?
15. In your opinion, what are some of the *key stories* (related to ecological integrity) that could be told along the Icefields Parkway?
- can list some of the examples that people have raised previously in my interviews such as human/wildlife interaction, water, pollutants, connectance, climate change, etc.)
 - WRITE ON CHART PAPER
16. (choose two from above) How do we tell these stories in a manner that best engages park visitors?
- 17a) Is this demographic specific?
 - 17b) Which demographic do we need to reach the most?

(TIME: 30 min)

VII. Conclusion

17. If there is just one thing that we could do better in terms of education for ecological integrity, what would it be?

Or

18. If you had designed these questions and could add one more, what would you ask?

(TIME: 10 min)

APPENDIX C
FOCUS GROUP REMINDER AND PREPARATION EMAIL

Hello all!

If you are receiving this email it is because you have agreed to participate in a discussion with others, who like you, are interested in environmental education in the Mountain Parks – and the Icefields Parkway more specifically.

To get us all thinking about these issues in advance I'd like for each of you to come on [DATE] having thought about what the concept "ecological integrity" means to you. There are no boundaries placed on this!

Some additional details:

The discussion will take place at [LOCATION AND ASSOCIATED DIRECTIONS]. Please allow for at least two hours – I know you all have a lot to say! I hope to begin at [TIME], so if we could all be there a few minutes early that would be fantastic

Attached you will find a copy of my consent form – this is to ensure that I conduct all my research in an ethical manner. I will bring copies of this to the discussion for each person to sign, but wanted to ensure that you had the opportunity to read it in advance if you wished.

I am looking forward to seeing you all soon,

Hailey

APPENDIX D ORIGINAL CODE TREE

Connectance (C)

Pristine (P)

Native Species (NS)

Natural (N)

Dynamic (D)

Persistence (P)

Intrinsic Value (IV)

Utilitarian Value (UV)

Aboriginal Values (Abor)

Wilderness (W)

Economic factors (EF)

Scale (S)

- Local
- Regional
- global

Biodiversity (B)

Ecosystem Health (EH)

Definition of Integrity (I)

- Pristine ecosystems have integrity (I1)
- Certain states of ecosystems have integrity, not necessarily pristine (I2)
- Metaphor for understanding ecological, social and individual coexistence (I3)

Spiritual Connection to the land (S)

Role of the Built-environment (B-env)

APPENDIX E

EXAMPLE VERSION OF THEMATIZED CODE TREE

Principles of EI (for Ed)	Criteria for Education	Bridging Themes
<p>Associated Terms: Inter-related Web (Knowledge of) (~ eco)</p> <ul style="list-style-type: none"> - Connectance, energy flows - Human connection to env <p>Connectivity (trans-boundary) (~ spatial)</p> <p>Pristine</p> <p>Native Species (P)</p> <p>Natural</p> <p>Wilderness</p> <p style="padding-left: 20px;">Biodiversity (P)</p> <p>Health</p> <ul style="list-style-type: none"> - Ecosystem health - Human health <p>Wholeness</p> <ul style="list-style-type: none"> - Intact ecosystems - Feeling of <p>Dynamic / Change (C)</p> <p>Unique (P)</p> <p>Parts & Processes (P) (~eco) (~spatial)</p> <ul style="list-style-type: none"> - Parts - Processes (often forgotten) <p>Other things that EI evokes:</p> <p>Intrinsic Value* (pride in it just being there)</p> <p>Utilitarian Value* (ecosystem services)</p> <p>Aesthetic value* (beauty) (P)</p> <p>Freedom of life to evolve (C) ("things left to just</p>	<p>Making connections Visible (~socio)</p> <p>Message extends beyond Park Boundaries (relevant to people's everyday lives) (~socio) (~spatial)</p> <p>Use of alternative vocabulary</p> <ul style="list-style-type: none"> - Dislike actual words "ecological Integrity" <p>Reliance on scientific "definition" not useful for getting people to appreciate values of EI (need to bridge gap b/w scientific knowledge and public knowledge)</p> <p>Get away from still pictures / pretty scenery ("this a place of change, and life ...") (C)</p> <p>Facilitated Connections with <i>place</i> (educators need to) (~socio)</p> <p>Experiential (intimate personal experiences) (~socio)</p> <ul style="list-style-type: none"> - person to person - in landscape (mountains will teach you) - personal experience + info (need certain knowledge to appreciate experience) <p>Solitude (P)</p>	<p>Place-Based (local entry point) (P)</p> <p>Native Species Parts & Processes Aesthetic value Sense of "Place" Spiritual Connection to the land Facilitated Connections with <i>place</i> experience of educator cumulative experience of visitor Aboriginal history Specialness</p> <p>Change (C)</p> <ul style="list-style-type: none"> - Dynamic - Freedom to evolve - Emphasis on 'process' (not just 'parts') - Inherently unknowable / can't ever fully understand (requires continuous learning) - Value changes - Mystery and awe - Grand sense of time - Education based on continuous research - Away from still images - Things not static <p>Connectedness (~)</p>

<p>tick along")</p> <p>Land Use (continuum) (~socio)</p> <p>Grand sense of "Time" (C) (with regards to change)</p> <p>Spiritual Connection to the land (~socio)</p> <p>Sense of "Place" (P) (~)</p> <p>Mystery / Awe (C) (cannot be known, but is respected)</p> <p>Inherently unknowable / can't ever fully understand (C) (Requires Continuous learning, but implies that some may be known)</p> <p>Education needed to protect EI (can't have one without the other in present context)</p> <p>Sacrifice / restraint</p> <p>Ideal (to strive for)</p> <p>Mystic (unrealistic, romantic)</p> <p>Future generations (~temporal)</p> <p>Role of Humans (~socio)</p> <ul style="list-style-type: none"> • Humans are apart from and threaten (pristine) ecosystems • Humans are apart, but ecosystems are always under anthropogenic stress • Humans are part of ecosystems, thus they both influence and are influenced • Ecosystems are part of humans and cannot be meaningfully separated <p>Scale</p> <ul style="list-style-type: none"> • Local • Regional • Global 	<p>Time (~socio) (~temp) (amount of time spent in landscape impacts understanding)</p> <ul style="list-style-type: none"> - experience of educator (educator understanding and connection to place transferable) - cumulative experience of visitor (increase T spent in environment) <p>Instill sense of wonder & curiosity (learning inherent to the concept) (C)</p> <p>Communicate current relevant research (C)</p> <p>Surprise (~ & C) "holy shit factor" (ah- haa!)</p> <p>"So What?!" (context) why does this matter? What's the big picture?</p> <p>Appeal to heart and spirit (~socio)</p> <p>Value-changes (Historical changes in societal understanding of Ecology great learning point ie. Used to hunt wolves in park, fire management)</p> <p>Stewardship Message (~) what you can do? How far do these messages go?</p> <p>Cultivate sense of "Belonging" (~socio) creates responsibility, as opposed to "ownership"</p> <p>Telling a "Story" (~, P, C)</p> <ul style="list-style-type: none"> - Ecological history - Cultural history 	<p>Ecosystem: (~ eco)</p> <ul style="list-style-type: none"> - Web of life <p>Spatial: (~ spatial)</p> <ul style="list-style-type: none"> - local - regional - global - trans-boundary connectivity <p>Socio/Cultural: (~ socio)</p> <ul style="list-style-type: none"> - people connecting with place - people connecting with people - role of humans in the environment <p>Temporal: (~ temp)</p> <ul style="list-style-type: none"> - reconcile short and long term thinking - ie. importance of "getting people while they are here" to connect with people outside the park OR "preserving this place for people today and for future generations"
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<p>EI = how humanity conceives natural env (not just in parks)</p> <p>EI 1st priority of Park</p> <p>Associated feelings generally positive, happy, celebratory</p> <p>When EI exists - this very SPECIAL</p> <p>Personal integrity</p> <p>not limited to Park or large spaces</p>	<ul style="list-style-type: none"> - Ecological & Cultural as one <p>Tacit education</p> <ul style="list-style-type: none"> - facilitate people moving through landscape (so that nature does the teaching) (~socio) (P) - spread people out (to limit crowding, allow for solitude) - basic infrastructure (ie. bathrooms, parking, appropriate pull-off sites, etc) - sustainable infrastructure (ie. Green buildings, alternative forms of transit, etc) - leading by example (inspirational individuals in educational roles) (~temp) <p>Outreach Education (~spatial) (education outside park boundary)</p> <p>Aboriginal history (C, P, ~)</p>	
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APPENDIX F

A BIOPHYSICAL SKETCH OF THE ICEFIELDS PARKWAY

(adapted from PCA 2007c).

Geology & landform

- With the Parkway being located within the main ranges of the Rockies, some of the oldest rock in both Jasper and Banff national parks is exposed in standard sedimentary rock formation and overthrust faults.
- The landscape seen today is the result of glaciers having retreated approximately 9-10,000 years ago. The Parkway offers views of virtually every geographic feature associated with glaciated mountain landscapes and alluvial processes including hanging valleys, moraines, glacial lakes, glacier tarns and lakebed deltas.
- The combination of weather patterns, mountain elevation, north-south mountain alignment and proximity to the Continental Divide resulted in past high annual snowfalls that have directly contributed to maintaining the remnants of the last glacial period. (Today there are seven large glaciers and 25 smaller glaciers bordering the Parkway.)

Vegetation & fire

- Three major ecoregions typify the Icefields Parkway region: montaine (10%), subalpine (50%), and alpine (40%).
- An ancient forest with Englemann spruce more than 700 years old is located near the Athabasca glacier
- A short growing season in this area means that vegetation is particularly sensitive to disturbance. Seasonal closures in popular skiing/snowboarding and hiking regions have been used in an attempt to mitigate disturbance.
- Non-native vegetation appears in isolated patches along the highway, gravel pits and other disturbed areas, but the number of non-native species is notably low in when compared with other regions in the Mountain National Parks.
- Several areas of “natural significance” have been identified along the Parkway for the occurrence of rare plants amongst other special features like significant cultural resources, animals, habitats, and unique landscape features. These areas include Bow Lake, Saskatchewan Crossing, Graveyard Flats, Parker Ridge, and Wilcox Pass.
- Compared to fire patterns in the bulk of Banff and Jasper national parks, fire cycles in this region are long. Wildfires here tend to be infrequent, but generally very intense. Currently, several prescribed burns have been proposed for the area for reasons of facility protection, and restoration of animal habitat.

Hydrology & aquatic resources

- The headwaters of three major rivers, the Bow, North Saskatchewan and Athabasca, originate along the Icefields Parkway. Also within viewing distance of the Parkway are several glacial-fed lakes, including Hector, Bow, Peyto and Upper and Lower Waterfowl Lakes.

- Despite the Parkway's near-pristine environment, long range pollutants deposited in the snow and rain, such as mercury and organochlorides, have affected local water quality. Concerns have been raised over the accumulation of pollutants over time. Once these chemicals find their way into watercourses, they bio-magnify as they move up through the food chain. As a result, a fish consumption advisory has been issued for the Mountain National Parks based on research indicating high levels of mercury in local fish species.
- According to Environment Canada, water quality of the three major watersheds is judged to be generally good, albeit there are some concerns. All surface waters in the region contain water borne parasites or pathogens and some water treatment systems at facilities along the Parkway fail to meet current design standards.
- Similarly, there is concern over wastewater management in some facilities since they fail to meet current design standards. A harsh local environment means that conventional waste-water systems will not work, and pump-out facilities require the waste to be transported long distances before eventual disposal.
- Highway practices have introduced contaminants such as road salt into soil and aquatic environments. Additionally, many culverts redirecting drainage now block or hinder fish, amphibian and small mammal passage.
- Most lakes in the region were previously stocked with non-native sport fish, which are out-competing and hybridizing with native fish species causing a decline in native populations.

Wildlife

- Little to no research and monitoring on wildlife has taken place in the drainages along the Icefields Parkway in recent years. Consequently, current information gaps make it difficult to identify emerging issues and trends in wildlife populations in the area. That said, Jasper National Park currently monitors caribou, wolves, and elk along the Parkway, while Banff National Park monitors mountain goats and bighorn sheep between Saskatchewan River Crossing and the Columbia Icefield.
- In light of the steep rock and ice characteristic of this area, the number of places where wide-ranging carnivores and migrating ungulates can pass from one valley to the next is limited. As such, the corridors for movement that do exist are very important. Along the Parkway several east-west corridors exist that bisect the highway and are affected by high volumes of traffic using the area. Most wildlife mortality on the highway occurs from June-October; deer, black bear and elk are the three most commonly hit on the Banff side of the Parkway, while elk, deer and caribou are the three most common on the Jasper side. The use of highway de-icing salt is suspected to contribute to these collision rates.
- Species of interest identified by Parks Canada include: Mountain goats, bighorn sheep, elk, and lynx.
- Species most at risk in the area include Woodland Caribou.

Climate change

- The issue of climate change has implications for each of the four sub-headings above, and posits itself as one of the primary ecological integrity issues concerning the Icefields Parkway region.
- The area of glaciers and icefields in the southern Rocky Mountains is estimated to have decreased 25% between 1850 and 1992 due to global climate change. [According to Dr. Sauchyn and his team, the climate in this region is warming “at a rate higher than the global average” (Sandford 2007:162)]
- The mean annual temperatures for this region were 1.4 degrees warmer in the mid 1990s than a century earlier. Current climate change models have projected an increase of 1.1 to 5C degrees in temperature, with the largest increase taking place in the winter months.
- Warmer spring and fall temperatures will likely extend the melting season by at least one month. Lower elevation glaciers less than 100 meters thick such as Peyto are projected to decrease rapidly, disappearing in the next 20-30 years.
- Accelerated glacial retreat will increase summer runoff until the eventual depletion of glaciers, at which point water scarcity in the whole watershed would be possible. Some argue that higher elevation glaciers, such as the Columbia Icefield, will be less affected.
- Projections indicate that winter and spring precipitation will increase while summer precipitation will decrease. Increased winter precipitation will have significant effects on avalanche activity.
- In the Canadian Rockies, a temperature shift of 1-6C degrees will cause vegetation zones to shift upwards by approximately 500 to 600 meters, possibly resulting in the loss of some high alpine species of flora and fauna, in addition to the disappearance of some sub-boreal and montaine species.
- A shift in vegetation zones may further threaten species such as the Woodland Caribou. Projections for increased winter precipitation may also restrict large mammal movement, thus threatening their winter survival. [According to some, climate change poses one of the greatest challenges protected areas managers will ever face as the maintenance of global biodiversity will effectively become a moving target of ecological representativeness (Sandford 2007).]

APPENDIX G

INFORMED CONSENT SHEET: FOCUS GROUP

Title

Communicating the Values of Ecological Integrity through Education in National Parks:
A Case Study of the Icefields Parkway

Local Principal Investigator

Name: Hailey Ross

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Degree Program

Master of Environmental Studies

Supervisor

Dr. Alan Warner

School for Resource and Environmental Studies, Dalhousie University

Email: alan.warner@acadiau.ca

Phone: 902-585-1562

Contact Person

Hailey Ross or Alan Warner. Please use these contacts to seek information or assistance about the study at any time.

Introduction

You are invited to take part in a research study being conducted by Hailey Ross who is a graduate student at Dalhousie University as part of her Masters of Environmental Studies degree program. Your participation in this study is voluntary and you may withdraw from the study at any time. In addition, you may also refuse to answer any question and withdraw any statements that you make prior to publication of the researchers work in June, 2008. Participating in the study will not likely benefit you directly, but we might learn things that will benefit the broader society or result in better protection of the environment in the future. Funding for this research project has been provided in part by Parks Canada. The study is described below.

Purpose of the Study

This research project explores the social significance of the concept of ecological integrity as Parks Canada's primary management objective. This study will examine the social values that are attached to this biological term. In addition, this research will also

examine the educational opportunities within the Mountain Parks and facilitate a process whereby various individuals who have an interest in environmental education in this area may co-create key elements of a vision for education based on the values of ecological integrity. This research project takes a case-study approach by focusing on the Icefields Parkway located in Banff and Jasper National Parks, Canada.

Study Design

This project utilizes three primary data-gathering methods. These include participatory site visits to the Icefields Parkway whereby the researcher may observe and participate in popular educational opportunities available to the public. Key informant interviews will be conducted with select individuals from a variety of interest groups who have a role in communicating the values associated with ecological integrity. Finally, this study relies heavily on the use of discussion groups (focus groups) for the bulk of its data.

Who can Participate in the Study

You may participate in this study if you have an interest in the ways in which Parks Canada's ecological integrity management objective is being operationalized on the ground within the context of environmental education.

Who will be Conducting the Research

The Principal Investigator, Hailey Ross, will be conducting the research.

What you will be asked to do

You are being asked to participate in two focus groups each of which will be approximately two to three hours in length. This means that you are being asked for a total of four to six hours of your time. These focus groups will occur at the time and place specified on your invitation.

Possible Risks and Discomforts

Any potential risks and discomforts from participating in the study are minimal.

Possible Benefits

There are no anticipated direct personal benefits.

Compensation/Expense Reimbursement

There is no anticipated compensation/expense reimbursement.

Confidentiality and Anonymity

Anonymity: You will not be identified by name in any publications unless you offer consent for the Principal Investigator to do so.

Confidentiality: Due to the nature of any group discussion whereby other people involved in the discussion will be aware of what you have communicated to the group, complete anonymity can not be guaranteed. However, the researcher will ask those who participate in the focus group to keep the shared information confidential and will ensure that you will not be identified by name in the resulting data. You will be identified by using a code in the data, the key to which will be protected on a computer to which only the Principal

Investigator has access. Electronic copies of the data will be stored on a computer to which only the Principal Investigator and her research supervisors have access. All data, including field notes, will be stored in a secure location to which only the Principal Investigator and her research supervisors have access.

Data Retention: Audio recordings for the focus groups will be destroyed after they are transcribed. All other data will be securely maintained as outlined above for five years following publication.

Questions

Please feel free to direct any questions you may have about the study to Hailey Ross, Principal Investigator. You will be provided with any new information that may affect your decision to participate in the study.

Problems or Concerns

In the event that you have any difficulties with, or wish to voice concern about, any aspect of your participation in this study, you may contact Patricia Lindley, Director of Dalhousie University's Office of Human Research Ethics Administration for assistance: (902) 494-1462, patricia.lindley@dal.ca

Signature(s)

1) I _____ have read the explanation about this study. I have been given the opportunity to discuss it and my questions have been answered to my satisfaction. I hereby consent to take part in this study. However, I realize that my participation is voluntary and that I am free to withdraw from the study at any time.

Signature _____ Date _____

Principal Investigator's
Signature _____ Date _____

2) I _____ give permission for the focus group to be audio-recorded.

Signature _____ Date _____

3) I _____ give permission for the focus group to be video-recorded.

Signature _____ Date _____

4) I _____ give permission for the researcher to use direct quotations of myself in her thesis. I understand that if my real name is used I will be given the opportunity to review the quotes before use initial thesis publication to ensure accuracy and confidentiality. Further publication may occur after the thesis is complete when the researcher would not be obligated to contact research participants.

Signature: _____ Date _____

5) I _____ give permission for my name to be used in publications and be attributed to any direct quotations.

Signature: _____ Date: _____

6) I _____ consent to be contacted at a later date in order to review transcripts of the focus group.

Signature: _____ Date: _____

Email: _____ Phone: _____

APPENDIX H

INFORMED CONSENT SHEET: KEY INFORMANT INTERVIEWS

Title

Communicating the Values of Ecological Integrity through Education in National Parks:
A Case Study of the Icefields Parkway

Local Principal Investigator

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Phone: 902-585-1562

Contact Person

Hailey Ross or Alan Warner. Please use these contacts to seek information or assistance about the study at any time.

Introduction

You are invited to take part in a research study being conducted by Hailey Ross who is a graduate student at Dalhousie University as part of her Masters of Environmental Studies degree program. Your participation in this study is voluntary and you may withdraw from the study at any time. In addition, you may also refuse to answer any question and withdraw any statements that you make prior to publication of the researchers work in June, 2008. Participating in the study will not likely benefit you directly, but we might learn things that will benefit the larger society or result in better protection of the environment in the future. Funding for this research project has been provided by Parks Canada. The study is described below.

Purpose of the Study

This research project explores the social significance of the concept of ecological integrity as Parks Canada's primary management objective. This study will examine the social values that are attached to this biological term. In addition, this research will also examine the educational opportunities within the Mountain Parks and facilitate a process

whereby various individuals who have an interest in environmental education in this area may co-create key elements of a vision for education based on the values of ecological integrity. This research project takes a case-study approach by focussing on the Icefields Parkway located in Banff and Jasper National Parks, Canada.

Study Design

This project utilizes three primary data-gathering methods. These include participatory site visits to the Icefields Parkway whereby the researcher may observe and participate in popular educational opportunities available to the public. Key informant interviews will be conducted with select individuals from a variety of interest groups who have a role in communicating the values associated with ecological integrity. Finally, this study relies heavily on the use of discussion groups (focus groups) for the bulk of its data.

Who can Participate in the Study

You may participate in this study if you have an interest in the ways in which Parks Canada's ecological integrity management objective is being operationalized on the ground within the context of environmental education.

Who will be Conducting the Research

The Principal Investigator, Hailey Ross, will be conducting the research.

What you will be asked to do

You are being asked to participate in one open-ended interview of thirty minutes to two hours in length. Interviews will occur at a time and place that suits you best to be arranged between you and the investigator.

Possible Risks and Discomforts

Any potential risks and discomforts from participating in the study are minimal.

Possible Benefits

There are no anticipated direct personal benefits.

Compensation/Expense Reimbursement

There is no anticipated compensation/expense reimbursement.

Confidentiality and Anonymity

Anonymity: You will not be identified by name in any publications unless you offer consent for the Principal Investigator to do so.

Confidentiality: You will not be identified by name in the data. You will be identified by a code in the data, the key to which will be protected on a computer to which only the Principal Investigator has access. Electronic copies of the data will be stored on a computer to which only the Principal Investigator and her research supervisors have access. All data, including field notes, will be stored in a secure location to which only the Principal Investigator and her research supervisors have access.

Data Retention: Audio recordings for the interviews will be destroyed after they are transcribed. All other data will be securely maintained as outlined above for five years following publication.

Questions

Please feel free to direct any questions you may have about the study to Hailey Ross, Principal Investigator. You will be provided with any new information that may affect your decision to participate in the study.

Problems or Concerns

In the event that you have any difficulties with, or wish to voice concern about, any aspect of your participation in this study, you may contact Patricia Lindley, Director of Dalhousie University's Office of Human Research Ethics Administration for assistance: (902) 494-1462, patricia.lindley@dal.ca

Signature(s)

1) I _____ have read the explanation about this study. I have been given the opportunity to discuss it and my questions have been answered to my satisfaction. I hereby consent to take part in this study. However, I realize that my participation is voluntary and that I am free to withdraw from the study at any time.

Signature _____ Date _____

Principal Investigator's
Signature _____ Date _____

2) I _____ give permission for the interview to be audio-recorded.

Signature _____ Date _____

3) I _____ give permission for the researcher to use direct quotations of myself from this interview in her thesis. I understand that if my real name is used I will be given the opportunity to review the quotes before use initial thesis publication to ensure accuracy and confidentiality. Further publication may occur after the thesis is complete when the researcher would not be obligated to contact research participants.

Signature: _____ Date: _____

4) I _____ consent to be contacted at a later date in

order to review my transcripts.

Signature: _____

Date: _____

Email: _____

Phone: _____

APPENDIX I
CONFIDENTIALITY AGREEMENT: RESEARCH ASSISTANT

I, _____, agree to keep all information expressed by research participants in discussion with each other and the principal researcher, Hailey Ross, absolutely confidential. Any information gleaned throughout the research process for which I am involved will be shared solely with the researcher.

Signature _____

Date _____

Principal Investigator's
Signature _____

Date _____