APPLYING SOCIAL SCIENCE METHODS TO VISITOR RESEARCH IN TERRA NOVA NATIONAL PARK

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by

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ABSTRACT

Canada's national parks are mandated to protect both the natural and cultural significance of the unique places they represent. Each national park is required to evaluate the outcomes of their external communications strategies. Social science research methods were applied to the evaluation of park communications to key audiences in Terra Nova National Park (TNNP), Newfoundland. Data collected through a questionnaire were used to measure the effectiveness of the parks communications to its two critical audiences: visitors and community residents. Data were analyzed relating to the understanding of the three main interpretative themes of the park: Canada's national park system, local issues in TNNP and ecological issues in TNNP. Research results indicate that visitors are more likely to avail of the parks educational programming than community residents and that community resident believe the experiences offered in national parks can be found elsewhere. Visitors demonstrated significantly more positive attitudes towards national parks and TNNP, although both audiences demonstrated a generally positive attitude. Visitors also demonstrated consistently higher levels of knowledge than community residents although knowledge of ecological issues was weak among both groups. The values exhibited do suggest that national parks are perceived to be of great benefit to both key audiences.

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1.0 Introduction

National parks in Canada are mandated to protect both the natural and cultural significance of the unique places they represent. The interaction of human population with their environments and the understanding of that relationship has been a longstanding area of research among physical and human geographers, first substantiated in the early writings of Aristotle. In its simplest form, geography is the study of people and place. Applied geography can help to study the human aspect of protected areas due to this interaction between humans and the environment.

Each national park within the system of national parks in Canada is required to evaluate the outcomes of their external communications strategy. Social science can assist managers in this process of engagement by providing valid ways to understand and address the needs of park audiences. To evaluate the effectiveness of parks communication, the entire complement of educational messaging must be examined. Parks Canada delivers messages through its offer of personal interpretation programs, outreach education programs, non-personal interpretative media, national and provincial marketing campaigns, community involvement programs, and tourism media (G. Stroud, Personal Communication, 2003).

In 1976, Interpretation Canada defined interpretation as, "a communication process, designed to reveal meanings and relationships of our cultural and natural heritage, through involvement with objects, artifacts, landscapes and sites" (Interpretation Canada, 2009, p. 1). The role of interpretation as a tool to educate and elicit emotional responses that support park values will be critical to positive public support (Butler, 1993; Dearden & Rollins, 1993). The question remains, how do we measure the understanding of the messages delivered to the park's key audiences? Parks Canada and Terra Nova National Park have been evaluating visitor satisfaction with regard to facilities, services, and educational programming, but little research has been conducted to measure understanding of National Parks, Terra Nova National Park, and ecological integrity issues. This question will be addressed in this thesis to aid the development of a social science strategy that institutionalises a culture of social science and a human resource network within the national park system.

Parks Canada represents a system of 42 National Parks across Canada; this human dimensions study in Terra Nova National Park will be used to test the application and effectiveness of standardised survey methods in a national park setting. Addressing such questions requires the implementation of an appropriate methodology and research design. This study evaluates Terra Nova National Park's targets for visitor and community understanding of park messaging and explores relationships between the knowledge levels and attitudes between park audiences. This study aims to explore and

evaluate the implementation of social science methods to visitor research in protected areas.

1.1 Genesis of the study

The *Canada National Parks Act* states that national parks are "dedicated to the people of Canada for their benefit, education, and enjoyment" (Minister of Justice, 2011, p. 2). Parks Canada is mandated to "foster public understanding, appreciation and enjoyment in ways that ensure their ecological and commemorative integrity for present and future enjoyment." Inherent in the Act is the emphasis on learning through educational experiences provided within natural and cultural environments. According to Parks Canada's (2001a) external communications strategy, *Engaging Canadians*, the more Canadians know about national parks, national historic sites, and national marine conservation areas of Canada and appreciate their resources, issues and challenges; the more likely they will appreciate these places and support the work required to assure their conservation and protection.

Engaging Canadians (Parks Canada, 2001a), enables "Parks Canada to deliver its priority messages to target audiences in the most effective and efficient manner" by focusing "energies on target audiences and key messages where they will have the greatest positive impact." The recent shift within national parks to emphasise the *Engaging Canadians* strategy focuses on providing opportunities for Parks Canada to more effectively listen to and learn about the people that use national parks and those who live

in communities near national parks. The desired outcome is an ongoing dialogue with Canadians that will help parks to provide satisfying visitor experiences that communicate park messaging effectively and develop meaningful relationships with surrounding communities. The successful implementation of the *Engaging Canadians* external communications strategy should result in awareness and understanding of the role and mandate of Parks Canada and of the issues that the Parks Canada Agency addresses through targeted interpretation programming.

Ecological integrity was documented as the priority concern for Parks Canada (1994, http://www.pc.gc.ca/docs/pc/poli/princip/sec1/part1d.aspx) in *Guiding Principles and Operational Policies* which stated, "Protecting ecological integrity…takes precedence in acquiring, managing, and administering heritage places and programs." According to the *Canada National Parks Act*, ecological integrity is defined as, with respect to a park, "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 change and supporting processes" (Minister of Justice, 2011, p. 1). Parks Canada's objective is to allow people to enjoy national parks as special places without damaging their integrity.

People are a critical component of conservation, thus it is important to evaluate the human dimension of ecological integrity as well as biophysical aspects. Public involvement is critical to the achievement of cultural and ecological goals. The *Terra*

Nova National Park Ecological Integrity Statement (2000) clearly outlines two specific targets for visitor understanding of threats to the TNNP ecosystem: (1) 80% of visitors must be able to identify at least one major threat to park ecosystems and (2) 80% of visitors and 50% of residents in local communities must be able to identify at least one remedial self-propelled behaviour that will aid in the creation of a sustainable society. Using this document as a guide, Terra Nova National Park has set the targeted level of understanding for other messages and key knowledge indicators at 80%.

Terra Nova National Park, in accordance with National Park guidelines, must demonstrate whether or not these targets have been reached. In addition to evaluating targets, park management and social science researchers are interested in understanding factors that may influence knowledge and whether significant differences exist among park audiences. At present, there is no national standardised survey method to measure levels of understanding or attitudes; therefore, there is a need to establish baseline data across the parks system that can be used to measure changes in knowledge and attitudes over time.

Human Dimensions Research that employs social science methodologies is becoming widely used to understand people's interactions with natural and recreational settings. The Human Dimensions Research Unit at Cornell University describes Human Dimensions Research as the study of human attitudes, values and behaviors associated with natural resource management that applies theory and empirical findings to real-

world, contemporary problems (Cornell University, 2008). The aim of this type of social science research is both to describe and to understand society. It relates theory to research by examining theory building, theory testing, the interplay of theory and observation, and the need for descriptive research (De Vaus, 1996). Within this emerging field of social scientific study there are many tools available to explore the people and issues that we strive to understand. These tools may be implemented to evaluate both social and biophysical impacts of human activity. According to Dearden and Rollins (1993), "society is at a critical juncture in terms of its relationship with environment, and parks and wilderness protection is an integral and significant symbol of this change" (p. 2). The effective management of protected areas will require greater contribution from the scientific community, specifically from social sciences (Dearden & Rollins, 1993; Payne & Graham, 1993).

In 2003, Terra Nova National Park embarked on a two part Human Dimensions research study to address these research questions and report on the outcomes of the implementation of the *Engaging Canadians* Strategy. Terra Nova National Park commissioned part one (Pitcher & Bath, 2003) of this study to document the strengths and weaknesses of available and appropriate social science research methods. This thesis represents part two of the research, commissioned in 2004, aimed at evaluating the effectiveness of messaging directed at the two most important audiences, local communities and repeat visitors to Terra Nova National Park. Research methods for this study were based on the best practices documented in the 2003 study.

1.2 Geography of Field Area

Understanding of these issues, particularly the applied nature of the research, warrants an understanding of the human and physical geographies of Terra Nova National Park. Terra Nova National Park is one of 42 national parks in Canada's National Park System and the first of three national parks established in Newfoundland and Labrador. Each national park in Canada represents a natural region of Canada (Figure 1.1). Terra Nova National Park was established in 1957 as a representative example of the Eastern Island Boreal Forest, resultant of Newfoundland's isolation from other biogeographical areas, a harsh coastal climate, and a strong marine-terrestrial co-dependency. Terra Nova National Park lies in Eastern Newfoundland at the heart of Bonavista Bay. The 404 square kilometres now protected by Terra Nova National Park is a glacial landscape, carved and sculpted by the great force of the ice sheets that extended onto the continental shelves of Newfoundland twenty thousand years ago (Figure 1.2). Through a series of warming and cooling events, sea-level changes, and isostatic rebound, the landscape has evolved into one characterised by gently rolling hills, rocky irregular barrens, and a patchwork of bogs and forests.

Figure 1.1
Canada's national park system and the natural regions represented by each national park (used with permission from Park Canada).

Figure 1.2
Terra Nova National Park showing the local communities adjacent to the Park within the area known as the greater park ecosystem (used with permission from Parks Canada).

The Eastern Island Boreal Forest, as represented by Terra Nova National Park, is recognised for having a unique island biogeography. Most mammal species such as the Canada lynx (*Lynx canadensis*) and black bear (*Ursus americanus*) that live on the Island of Newfoundland came here after the glaciers retreated about 10, 000 years ago

(Burzynski, 1994; Scott, 2005; and Sommerville, 1997). Flora and fauna immigrated across exposed land bridges from mainland Canada and the United States and some may have survived in glacial refugia, or nunataks, areas that were free from glacial ice during the Wisconsinan. The Island's uniqueness limits our biodiversity. Many species that have been isolated from their mainland counterparts have evolved into distinct subspecies such as the endangered Newfoundland Marten. In fact, nine of the 14 native mammals in Newfoundland are believed to be distinct subspecies (Parks Canada, 2006). Boreal forest covers seventy percent of Terra Nova National Park, a dominantly coniferous forest of spruce and fir, interspersed with several deciduous species including aspen, birch, larch, and maple. Raised bogs containing sphagnum mosses and fens of grasses and sedges cover twenty-one percent of the park. The remaining nine percent represent disturbed areas (both natural and human disturbed areas such as insect kills or park infrastructure, respectively) and rocky outcroppings such as Louil Hill and Ochre Hill.

The area now represented by Terra Nova National Park area was first inhabited by the Maritime Archaic Indians from about 5,000 to 3,200 years ago when the Island reached its climatic optimum and the boreal forest had spread over the barren tundra landscape (Burzynski, 1994; Sommerville, 1997). As the climate steadily cooled, and wetlands and bogs formed in many areas of the Park, the Maritime Archaic Indians disappeared from the shorelines and were eventually replaced by the Groswater Paleoeskimo around 2,800 years ago and then by the Dorset Paleoeskimo around 2,000 years ago. By 1,400 years ago, these northern peoples had left the archaeological record (Burzynski, 1994;

Sommerville, 1997). About 800 years ago the area was occupied by the Recent Indian, a group of people believed to be the ancestors of Newfoundland's endemic Beothuk. English settlers reported to have seen Beothuk Indians in the area now occupied by the Park in 1575 but this entire group of people was extinct by 1829 (Burzynski, 1994). According to written records, Mi'Kmaw peoples resided in the area during the 1800s but oral records indicate that they may have been there much earlier (Parks Canada, 2006).

The Beothuk occupation was abruptly interrupted by the increasing seasonal presence of European visitors in the 16th century and permanent settlement in the 17th century. These early European Settlers led seasonal lifestyles, living off the sea in spring and summer and turning to the land in fall and winter, a lifestyle that persisted in Newfoundland for centuries. In the 1800s, fishing, logging, and furtrapping prevailed as a livelihood for many settlers along the shores of Newman Sound while agriculture developed in the Eastport and Clode Sound area (Burzynski, 1994). In the early 1900s, Newman Sound was the site of 19 family owned sawmill operations, many of these families still reside in the greater park area. The current location of the Park's Newman Sound Day-use Area served at the primary settlement, consisting of over 60 dwellings, barns, sheds, and cellars (Parks Canada, 2006). Harvesting of forest resources continued in the park area up until it was established as a national park, a designated protected area in 1957. By that time almost all white pine in the area had been felled for boatbuilding. Prior to its establishment, people living in the Park were relocated to communities outside the Park's new political boundary. Forced resettlement has elicited resentment among some people

in local communities towards national parks while others demonstrate pride in this protected ecosystem that lies at their doorsteps (G. Stroud, Personal Communication, 2003).

Today there are 12 communities that lie within the greater park ecosystem that was shown in Figure 1.2. Terra Nova National Park strives to protect the rich human history that is so important to maintaining the area's cultural heritage which is of great importance to many people who live in the communities adjacent to the park.

1.3 Purpose and Objectives

The purpose of the original work commissioned by Terra Nova National Park in 2003 was to validate the application of social science methods in protected areas by presenting relevant methods and determining the methods which are most effective in terms of application to the research environment, as well as, human, temporal, and financial resources. This first study outlined the following objectives related to the applicability of social science methods in protected areas: (1) to provide an analysis of quantitative and qualitative research designs, methods, and instruments; (2) to recommend the most viable social science research tools in national park research; (3) to illustrate that social science research methods may be effectively applied to visitor research in national parks; and (4) to develop a data collection instrument that could be adapted to meet human dimensions research objectives at the national parks level.

The purpose of this thesis is to provide a measurement of visitor and community understanding with respect to the role of Parks Canada, the role of Terra Nova National Park in the National Park System, and key ecological issues in Terra Nova National Park (the three main themes interpreted in Terra Nova National Park) using the recommendations from the 2003 study. This study represented by this thesis was commissioned by Terra Nova National Park in response to the national directive to evaluate the implementation of the *Engaging Canadians* Strategy (Parks Canada, 2001a). The study was also in response to the suspicion of interpretation staff that there were gaps in knowledge about and understanding of the three main themes interpreted in Terra Nova National Park. Similar gaps and inaccuracies in knowledge were also noted by facilitators during various public consultation processes (G. Stroud, Personal Communication, 2003). This thesis emphasises the applied aspects of evaluation research. A human dimensions research design and data collection instrument based on the review of social science designs and methods was developed to measure park audiences' understanding of Terra Nova National Park.

The following objectives relating to visitor and community understanding of National Parks were addressed: (1) to document baseline data to allow park managers to reassess and monitor changing knowledge levels and attitudes; (2) to evaluate and understand visitor and community general attitudes towards nature and the environment that may influence knowledge levels about park issues and general attitudes toward parks and protected areas; (3) to compare visitor and community attitudes toward and knowledge

levels of National and Local Park issues and document differences between these audiences to allow for specific recommendations with respect to each group; and (4) to determine if 80% of visitors can identify at least one major threat to park ecosystems (directed by the Ecological Integrity Statement). These objectives were targeted through the quantitative analysis of data collected from the questionnaire.

In addition to quantifying the level of understanding of community residents and park visitors, the study reflects on the role of non-formal education in management planning processes and the impact of interpretation on understanding. The following objectives were also addressed: (1) to consider possible factors that influence visitor and community understanding and attitudes such as interpretation programming, socio-cultural factors, and demographics; (2) to determine if participation in educational programming results in more positive attitudes and increased understanding; and (3) to provide direction for park management planning, particularly interpretation program offer.

1.4 Thesis Organization

Chapter One – *Introduction* – introduces the theory and concepts that will be applied and addressed in this thesis, presents the purpose and objectives of the study, and communicates the need for social science research in national parks. Chapter One introduces the national park system and identifies the human and physical geography of Terra Nova National Park, Newfoundland – the field study area. Chapter One also

briefly familiarizes the reader with definitions of several keys concepts including ecological integrity, interpretation, and human dimensions.

Chapter Two – *Literature Review* – elaborates on many of the concepts defined in the first chapter and explores the existing literature on the application of social science methods to park issues, human relationships with nature, national park management, and non-formal education and experiential education. Chapter Two focuses on the first research theme and provides a bank of methodological content critical to choosing the most appropriate social scientific methods and explores a variety of concepts that are imperative to the understanding and management of issues within Terra Nova National Park and the national park system.

Chapter Three – *Methodology* – describes specific methodologies and outlines research procedures used to explore the research questions and objectives presented in Chapter One. Chapter Three also includes a description of the research population, data collection instruments, measures, procedures, and data analysis.

Chapter Four – *Understanding of park themes by park audience* – presents the univariate results of the descriptive statistical analysis on each questionnaire item, focusing on the comparison between visitor and community knowledge, attitudes, and values. Results are presented through a series of tables and figures and a textual statement of results highlights the most relevant information.

Chapter Five – *Toward a better understanding of visitor and resident perceptions* – presents the results of the multivariate statistical analyses used to explore the objectives presented in the first chapter – illustrating and comparing the knowledge, values, and attitudes of repeat visitors and community residents. As in the previous chapter, results are presented through a series of tables and figures with the most relevant information highlighted by textual statements.

Chapter Six – *Discussion* – the final chapter interprets the key findings and discusses the results presented in Chapters Four and Five. This chapter also provides a statement of limitations and recommendations for future work in this area. Finally, Chapter Six draws conclusion based on the material and data presented in the thesis text with respect to the application of social science methods in the area of visitor evaluation research.

2.0 Literature Review

Human Dimensions Research has typically been applied to wildlife studies and some social research such as carrying capacity and social crowding research, but it is an interdisciplinary field that reflects the need to learn more about people in order to best manage any aspect of natural and cultural heritage (Bath, 1998). It employs social scientific approaches and methods to gather information about all elements of social phenomena – behaviours, values, experiences, knowledge, and attitudes. Human Dimensions Research has an applied focus and research may often involve one or more the following objectives: (1) understanding attitudes and beliefs to help managers in the decision-making process, (2) identifying beliefs that are most directly linked to attitude, allowing educational efforts to target gaps in knowledge, (3) identifying the nature of conflict between groups, or (4) building trust and credibility among stakeholders (Bath, 1998). Winter and Lockwood (2005, p. 270) state that "the involvement of the general community in the management of, and decisions made about, the future of natural areas is becoming increasingly important." Community involvement and cooperation among all parties is essential to the success of science-based or government operated programs.

Due to the interdisciplinary nature of Human Dimensions Research and the applied nature of this geographical research, the current literature on several themes will be reviewed and presented. First, the literature review presents a general overview on the valuation of natural spaces and attitudes toward wilderness since both may affect motivation for visiting and participating in park programs. Second, the literature review

examines interpretation and education in national parks from both theoretical and applied perspectives. Third, literature specific to research design and methodology was reviewed to summarize the most relevant and appropriate methods available in terms of human, temporal, and financial resources.

2.1 Natural value for natural areas

George Hartzog Jr., former Director of the National Park Service (US), remarked that parks are not merely set aside to preserve scenic and cultural vistas, rather, parks exhibit unique values in "ministering to the human mind and spirit" (Tilden, 1977). There are many views and uses of our environment that reflect the values of nature. Values for nature are diverse and vary with individual philosophy and perception of the environment. Anthropologists Peoples and Bailey (1997), define values as a people's beliefs about the goals or way of life that is desirable for themselves and their society" (p.22). Environmental values have evolved from purely anthropocentric (human-focused) to biocentric (ecology-focused) perspectives (Negra and Manning, 1997). There are two basic types of environmental values: instrumental and instrinsic.

The instrumental value of nature is based purely on human benefit whereas the intrinsic value of nature in based on the inherent qualities of nature (Rolston, 1994). According to Rolston's value theory (1994), humans are able to value both instrinsically and instrumentally. However, valuing occurs from the viewpoint of a conscious valuer. Only humans are valuing agents. This implies that it is not feasible to attribute a value to

living things that is independent of human valuing. In contrast, Elliot (1994) argues that nature has intrinsic value that in itself is quite apart from its present and future economic, intellectual, recreational, and aesthetic uses. "It is the otherness of nature, it separateness and distinctiveness from creatures such as ourselves…that underwrites its intrinsic value" (Elliot, 1994, p.36). Attributes such as diversity, stability, complexity, beauty, grandeur, subtlety, harmony, creativity, organisation, intricacy, elegance, and richness contribute to the aesthetic value of nature. These combined with the presence of such natural characteristics and the unintentional design of ecology, give nature its intrinsic value and such a value implies an obligation to preserve nature and minimise human interference.

George Altmeyer (2005) claims that three distinct ideas of nature emerged in Canada between 1893 and 1914.

> The idea of nature as a Benevolent Mother was a reaction against the effects of urban life. The idea of nature as a limited storehouse was a result of the death of the myth of abundance. The idea of nature as a temple was an attempt to alleviate religious uncertainty. For each of these themes, nature served as a medium to deal with the complexities of a nation in transformation (p.113).

Altmeyer argues that these various conceptions were a "protective reaction against the unsettling tendencies in modern society." These ideas still persist since therapeutic, educational, spiritual and resource values still dominate the societal landscape in Canada. John Miles (1987), a wilderness educator, writes of the value of nature as a place of contrast and challenge, a place where humans were not in control of their surroundings and "where they could experience humility and physical challenge of a sort uncommon in

human-altered environments." He continues to speak of a person's connectedness to one's own personal, social, and natural history through the experience of wilderness.

A number of value measurements have been applied to nature studies. Kellert (1989) outlines values applied to the valuation of wildlife. Winter and Lockwood (2005) use the Natural Area Value Scale (NAVS) to measure relative strengths of individuals' intrinsic, non-use, and use and recreation values for natural areas. The values indicators applied in this study are adapted from a series of 14 identified values and accompanying definitions presented by Negra and Manning (1997) as applied to visitor research in state parks (the operational definitions used by Negra and Manning follow each value statement in parenthesis). Nature is a haven for recreation (a place to enjoy outdoor recreation activities), spiritual retreat (a place to connect to God or spiritual matters), and therapeutic use (a place to maintain to regain one's health and mental well-being). Nature also provides a setting for historical preservation (places that are important to the history of an area) and cultural expression (places that show us what it must have been like for the first settlers of the area). Nature is valued for its aesthetic quality (a place to enjoy the beauty of nature), as well as intellectual stimulus (a place to go to think because civilisation cannot interrupt), and solitary sanctitude (a place to get in touch with one's self). Nature has an ecological value, for example, a place to protect the environment or to ensure our own survival; as well as an educational value, a place to learn about nature. Nature is a scientific medium where one can conduct scientific study on the natural environment and its components and a moral and ethical outlet where humanity can

express an obligation to respect and protect other living things. Finally, nature is a place where many economic benefits can be derived to enhance local development and a place to provide resources such as timber or minerals that may be harvested for society to use in the future.

Negra and Manning (1997) found that there was a hierarchy of values for parks, dominated by the traditional values of recreation and appreciation for natural beauty and seconded by educational opportunities, protection of ecological components and respect for nature. Furthermore, they discovered that religious or spiritual matters were not perceived as important, yet programs did facilitate personal reflection and physical and mental well-being. Finally, Negra and Manning suggested that park management priorities should shift towards educational and ecological roles according to visitor emphasis on these corresponding values. In contrast, Winter and Lockwood (2005) found that respondents were more supportive of intrinsic values while some reported recreational values as the most important. Winter and Lockwood stated that both strong negative values and strong positive values may impact attitudes towards decision-making. They concluded that "education and community engagement programmes concerning natural places are likely to have greater effect if they address the values on which respondents place the greatest importance."

2.2 Interpretation and transfer of learning in national parks.

Interpretation is not education; ideally, interpretation is about revelation. Successful interpretation is often about public relations and revelations or "P.R.R." — provoke, relate, reveal (Veverka, 1994). Interpretation is a three step transfer of learning process. Step one is provocation - to create interest where it may otherwise not exist. Step two is relation – to present knowledge, often disguised as entertainment, that connects to the personalities and experiences of the audience. Step three is revelation – to reveal hidden meanings and expose greater application of that information. Experience is fundamental to encouraging positive attitudes towards the environment and to establishing intimate connections between humans and nature.

Freeman Tilden (1977), the father of interpretation, first provided the profession with a formalised definition in 1957: "an education activity which aims to reveal meanings and relationships through the use of original objects, by first-hand experience, and by illustrative media, rather than to simply communicate factual information." Interpreters are usually patriotic to the six principles pioneered by Tilden (1977):

(1) Interpretation that does not somehow relate what is being displayed or described to something within the personality or experience of the visitor will be sterile.
(2) Information, as such is not interpretation. Interpretation is revelation based upon information.
(3) Interpretation is an art, which combines many arts, whether the materials presented are scientific, historical or architectural. Any art is in some degree teachable.
(4) The chief aim of interpretation is not instruction, but provocation.
(5) Interpretation should aim to present a whole rather than a part, and must address itself to the whole man rather than any phase.

> (6) Interpretation addressed to children (say up to the age of 12) should not be a dilution of the presentation to adults, but should follow a fundamentally different approach. To be at its best it would require a separate program.

Ranie (1980) listed six objectives for interpretation that reflect the Parks Canada Charter, mirror the objectives in the Engaging Canadians communications strategy, and parallel the management objectives for Heritage Presentation in the TNNP Management Plan:

> (1) To increase the visitors' understanding, awareness, and appreciation of nature, of heritage, and of site resources.
> (2) To communicate messages relating to nature and culture, including natural and historical processes, ecological relationships, and human roles in the environment.
> (3) To involve people in nature and history through first-hand (personal) experience with the natural and cultural environment.
> (4) To affect the behaviour and attitudes of the public concerning the wise use of natural resources, the preservation of cultural and natural heritage, and the respect and concern for the natural and cultural environment.
> (5) To provide an enjoyable and meaningful experience; and
> (6) To increase public understanding and support for an agency's role, it's management objectives, and its policies.

Beck and Cable (2002) modernised earlier notions of interpretation, further developing Tilden's original six principles into 15 principles of interpretation and formalised a modern definition of interpretation: "an informational and inspirational process designed to enhance understanding, appreciation, and protection of our cultural and natural legacy. George Hartzog Jr., former Director of the US National Park Service, commented that:

> We who have spent our lives working in and for parks should not expect other people to possess an instinctive knowledge of park values…A sensitive enjoyment and understanding of national parks does not come naturally to most persons. The majority require assistance, educational, and interpretative programs, and the opportunity for frequent visits. (Knudson *et al.*, 2003, p. 12).

For interpretation, experience is business and transfer of learning through experience is the product. Interpretation not only has the power to enrich recreational activities but it

also has the ability to increase visitor understanding of our cultural and natural history within the national parks system. "The *raison d'être* of interpretation is to help other people gain a sense of place, to respond to the beauty of their environment, the significance of their history and their cultural surroundings" (Knudsen *et al.*, 2003, p. 8). Canadian Yorke Edwards stated that "the job of interpretation is to open the minds of people so they can receive – on the world's best receiver, the human brain – the interesting signals that the world is constantly sending. And the messages sent, when added up, tell what the world is about" (Knudsen *et al.*, 2003, p. 3). National park interpreters seek to create experiences that foster appreciation of ecological and human history, lead to a deep understanding of national parks and reveal new ways of seeing the world.

2.2.1 Experiential Learning Theory

How can individuals develop a long lasting intimate connection to nature by reading about it in a book, without having ever experienced the trembling whispers of the golden aspen, the howling of wolves in the wild, or sleeping under the desert moon? We can't. Experience is our teacher; education a process of life experiences. This is the basis of experiential education. The cycle of experiential learning provides a neatly isomorphic framework upon which to build non-formal educational programs. Programs firmly grounded on the principles of experiential education assist the development of long-lasting memories and best facilitate a transfer of learning (Bacon, 1983; Gass 1995; Miles, 1991). The first two steps in the cycle are experience and reflection. It is

important that interpreters provide their audience with time to reflect on the experience. Learning is not an instantaneous event, reflective activities must engage the mind but also appeal to the kinesthetic senses; this will facilitate a more meaningful and transformational learning experience. Reflective processing encourages participants to describe, discuss, analyze, and understand what they are learning (Bacon 1983; Miles, 1987).

The last two steps in the cycle are generalization and application; these steps are essential for learning. It is important to show key audiences how they can use the new information and provide them with an opportunity to put it into practice. Applying this cycle to programming can increase the effectiveness of educational efforts and strengthen the ability to create transformational experiences – while enabling a change of undesirable attitudes and the presentation of valuable and factual information.

John Dewey (1981) asserted that learning is a process of experience that balances interest and effort. With respect to interpretation delivery, the most relevant point to be made is that while education is a process of experiences, it is not to become a process of "amusement and distraction." National parks are mandated to provide opportunities for both education and enjoyment. What is the magical balance between education and entertainment value? Interpreters are tasked with the responsibility to provide experiences that land within the educational opportunities end of the spectrum, yet interpreters often fall into the habit of rewarding visitors for their interest with prizes and

incentives and reinforce the expectation of the "song and dance." Dewey states that "life is too serious to be degraded to a merely pleasant affair, or reduced to the continual satisfaction of personal interests." If everything is made playful we distract and over-stimulate. Parks must carefully package interpretation experiences so that they do not over-stimulate visitor with meaningless drama but instead provide relevant, interesting, and meaningful experiences that engage visitors in the process.

2.2.2 The Power of Metaphor

All definitions of interpretation highlight the concept of relevance; information that is meaningful and relevant to the audience is more likely to be understood and remembered. One tool that can be useful in creating this connection between the message and the person is metaphor. A metaphor, in its most basic and accepted form, is defined as a figure of speech that likens one thing to another in such a way that sheds new light on the subject (Bacon 1983; Gass, 1995). Often, this definition is extended to include parable and allegory – a more deliberate and intellectual learning style, as opposed to metaphor, which is often absorbed unconsciously. Metaphors have increasing effectiveness in the pursuit of learning objectives with increasing "isomorphism" or similarity and relevance between the metamorphic situation and real-life (Bacon, 1983). Metaphors must be developed carefully and strategically. For example, in the park environment, interpreters often try to communicate how the life struggle of a certain animal parallels that of humans. Building upon the idea that humans search out a real-estate agent to find a new home, interpreters can help the audience understand habitat as it relates to a certain

species needs. Ideally, all elements in the metaphor are symbolically identical to elements in another experience. House becomes synonymous with habitat, neighbours with competition, proximity to a grocery store with the ability to find food, and so on.

Bacon suggests that as individuals we are constantly conducting "trans-derivational" searches to relate situations to past experiences and that these searches occur in all attempts to communicate. Interpreters try to facilitate this process for individuals through the fabrication of meaningful experiences. Communication is only difficult when the speaker wants the listener to learn something new. The ability to learn new strategies by re-ordering and re-organising concrete memories is the way in which anecdotes and metaphors help people change and grow. Approaches that incorporate relevant metaphors are usually more permanent than conventional techniques and draws upon important emotional experiences, while matching whole patterns of experience rather than single concepts (Gass, 1995). They must be highly isomorphic, may be aimed at resolving problems, and detailed to facilitate an individual's trans-derivational search.

2.2.3 Facilitation

Interpreters are facilitators. The methods interpreters choose and the way in which the audience is addressed can influence the transfer of learning. Gass (1995), an adventure educator, referred to *The Six Generations of Facilitation.* He explained the styles in order of occurrence and sophistication, only five are relevant and employable in interpretation programs. First, *let the experience speak for itself.* This technique leaves the audience to

derive their own personal understanding of the program. This may lead participants to arrive at their own insights but it is more likely that they enjoy the program but not gain any true understanding of the themes. Second is *speaking for the experience.* Enter the interpreter who interpreters the experience on behalf of the participant by informing them what they have learned and how to apply the new knowledge. This does not consider the diversity of program participants and the unique behavioural traits and prior experience that each individual brings to the group. Third is *debriefing the experience.* The previous techniques do not adequately provide the audience with time to reflect. Debriefing allows the participants to "learn through reflection." The "circle-up" approach draws participants together to reflect on the experience. Any time you want the group to reflect, participants are drawn into a socially secure circle where they must stand shoulder to shoulder and no one person stands out. Individuals are able to discover their own learnings and therefore, may be more likely to personalise the new information. They may also share insights not discovered by others and encourage group learning as well and personal insight. Fourth is d*irectly front-loading the experience.* Directing visitors before the experience begins or pre-briefing, may go beyond logistics and safety. This technique may be directed toward specific objectives based on need and combined with debriefing to re-emphasise key learning objectives. Finally, is *framing the experience.* This technique involves framing experiences isomorphically – or creating parallel structures that are proactively introduced by the interpreter. Deliberate metaphors create relevant connections to prior experiences. This technique can enhance the transfer of learning if the experience is motivating and relevant. Interpreters can use

this technique to create a mirror to the audience's personal reality by discussing the connections between the nature experience and everyday lives.

2.3 Interpretation research

Few parks have resource management plans or interpretation plans that strategically address social science needs (Zarki, 2004). Vander Stoep (2004) has seen a "decline and restructuring of social science research agendas" and supports this claim by noting that in 1994 the US National Park Service had one social science unit directed by a part-time university professor. Zarki (2004) concurs that at the park level, interpretation research is less robust and institutionalised than biological or physical sciences (less permanent staff and resources). Vander Stoep (2004) avers that interpretation research is difficult to find but desperately needed for both scholarly and practical reasons such as providing direction to interpretative planners, justifying interpretative programming and personnel, assessing the effectiveness of techniques, and identifying and understanding the varied roles of interpretation in various settings. She also denotes the responsibility of both practitioners and scholars to conduct interpretation research in coordination and collaboration so that each understands the role, process, and benefits of research.

Similar trends have been noted by Canadian researchers. Dearden and Rollins (1993) highlight the importance and utility of social science to improve the effectiveness of visitor management in Canada's National Parks System and note that "interpretation will increasingly focus on processes to educate and provide emotional responses of visitors in

support of park values" (p. 9). Payne and Graham (1993) support this idea and profess the need for social science in visitor planning and protected areas management. Payne and Graham also note a former preoccupation with natural sciences within parks but the emergence of new problems associated with visitor use have drawn attention to the utility of social sciences including geography, recreation, and leisure studies.

Zarki (2004) offers several explanations as to why visitor research is less evident than other sciences (biological or ecological research) at the park level. Firstly, Zarki notes that field interpreters are largely unaware of existing social science research and how it can be used to enhance program development. Secondly, interpreters have limited access to interpretation research. Finally, park managers are not well prepared to use and evaluate social science at the park level due to a lack of content in agency training for site managers. Compounding these shortcomings, interpreters exhibit a tendency to rely on their own intuitive judgement about park visitors rather than consult the social science community (Loomis 2002; Zarki 2004).

Former Director of the US National Park Service, George Hartzog Jr. stated in 1967 that "since an objective of any park administration is to improve the quality of park use, the effectiveness of our interpretation program is a major concern of all administrators (Tilden, 1997). Knudsen *et al.* (2003) reinforce the importance of interpretative processes not only to the enrichment of audience understanding of environment and culture but also as a service to managers by helping people to understand the needs and

processes of management. They also state that "an organisation that fails to evaluate indicates disrespect for its interpreters and disregard for the products of their work" (Knudsen *et al.* 2003, p. 367). They affirm that value is added to interpretative programming through the evaluation process and that evaluation should cover four components of the interpretative offer: (1) visitors, (2) individual "performances," (3) non-personal installations, and (4) overall productivity.

The National Association for Interpretation established a vision for effective interpretative evaluation in 1990. Evaluation of all interpretative efforts must be a part of the management process and should be a continuous process and modified when necessary. They add that evaluation techniques require clear goals and are effective when appropriate for the environment, organisation, and visitors. Loomis (2002) noted that "evaluators are more interested in knowledge use than knowledge production." Wiles and Hall (2005) commented that many interpretative programs strive to increase knowledge about resource issues but that knowledge is generally insufficient in promoting stewardship among the public. They reinforce that interpreters should focus on influencing attitudes. This is further supported by Bright *et al.* (1993) who affirm that research must reach beyond the assessment of interpretation's effect on knowledge levels.

DiEnno and Hilton (2005) investigated the effect of constructivist (mirroring the principles of experiential education) and traditional teaching methods on knowledge and attitudes. It was found that the constructivist group demonstrated significantly increased

knowledge scores and attitudes whereas the traditional method did not. Leeming *et al.* (1997) also studied the effect of participation in class activities on children's environmental attitudes and knowledge. They found that the program had a significant positive impact on attitude toward the environment but did not influence knowledge of environmental issues. Interestingly, parents of the participating children also demonstrated more positive attitudes.

These various views by many professionals and academics in the field of interpretation and protected areas management demonstrate the importance and call for more study in interpretation, outdoor learning, and human-environment related research within parks.

2.4 Exploring social science methodologies

Understanding social science is instrumental in developing a methodology (used to refer to the research process in its entirety), including research designs and specific methods (used to refer to concrete techniques used to acquire information). Generally, research designs and methods fall into two strategies of inquiry: qualitative and quantitative frameworks. A third mixed method strategy has emerged that combines elements from both frameworks. Within these three strategies there are many designs and methods that may be implemented. While there are a multitude of available designs, the design should ultimately reflect the skills and expertise of the research team and be adapted to best understand a specific research problem and the research questions. "Designs are rarely implemented straight from a book; it involves a hybrid, reflecting context specific

questions, limitations, and dynamics" (Bickman & Rog, 1998). With respect to choosing research methods, you must "find the tools that best fit the research question, context, and available resources" (Bickman & Rog, 1998). It is critical that the research problem be clearly defined and understood by all stakeholders. This section will briefly highlight the scope of evaluative research and discuss some of the available tools that are most appropriately and frequently used within the context of evaluation research. The combination of all these elements will form the methodology.

2.4.1 Evaluative research

Evaluation has been defined as "making a subjective judgment about worth or value" while evaluative research is defined by the use of "scientific process and methods to collect information systematically that will be used to make an objective judgment about a social intervention" (Riddick & Russell, 1999). The evaluative researcher uses a scientific perspective and chooses from among scientific methods the tools he needs to design and execute a study that will yield objective and useful information" (Riddick & Russell, 1999, p.4). Evaluative research measures the effectiveness of programs, policy, or practice. Evaluative studies are generally descriptive but may also be explanatory or exploratory (Neuman, 2000).

According to Loomis (2002) the implementation of evaluative studies is not a widespread practice. However, he acknowledges evidence that there is an increasing acceptance of evaluation within interpretation settings, including growing use of evaluation research, emergence of professional associations, increased professional development

opportunities, increased publications within the past 20 years, and Federal government (US) encouragement of the use of evaluative research in interpretative work. The growth and acceptance of evaluative studies is evidenced in a 2003 bibliography issue of the Journal of Interpretation Research that references about 120 periodicals, 130 workshop proceedings, and various books and technical reports on visitor studies and evaluation.

Managers and evaluative researchers should be aware of the challenges of this genre of research. Loomis argues that effective evaluative research should be incorporated into the routine professional work of institutions that offer interpretative services and cannot be separated from social and political influences created by people and institutions. Two key issues appear to define the political reality of evaluative research: (1) the use of intuitive judgement in making decisions about interpretation planning and (2) the importance of institutional politics in determining if evaluative research is done and how such studies will be used (Loomis, 2002). Bitgood (1996) notes that several concerns have complicated the political acceptance of evaluative research. Managers, institutions, and researchers have noted that there may be a fear of finding "no significant difference" or negative results. Other barriers include "a lack of understanding about evaluation, a failure to give evaluation sufficient priority, concern over possible negative consequences of evaluation, the nature of the institution, and lack of incentives for conducting evaluation studies" (Bitgood, 1996).

These concerns have fuelled resistance and raised barriers to the success of evaluative studies. Despite the challenges of completing evaluative research in some settings, there "is a growing awareness of ways to cope with barriers to using evaluative research (Loomis, 2002). Evaluative research emerged as a result of the emphasis on applied research (Loomis, 2002). As this new field of research developed, evaluative studies were differentiated from other types of research through its purposes, context and research methods (Krathwohl, 1998; Riddick & Russell, 1999).

2.4.2 Qualitative, quantitative and mixed method frameworks

The three frameworks or strategies of inquiry used in research are quantitative, qualitative, and mixed method. A research strategy should reflect the training and experience of the evaluator, consider the audience for the study, and complement the nature of the research problem; each strategy has an accepted set of standards and procedures (Riddick & Russell, 1999).

Quantitative research usually addresses the question – What? "A quantitative approach is one in which the investigator primarily uses post-postivist claims for developing knowledge" (Creswell, 2003. p.18). Quantitative researchers emphasise the measurement of variables and testing hypotheses that are linked to causal explanations; they rely on a positivist approach, use a technocratic perspective, apply "re-constructed logic," and follow a linear research path (Neuman, 2000). Evaluative research is often conducted within a quantitative survey research design. For example, Hammitt *et al.* (2001) used

quantitative survey questionnaires and factor analysis to understand the cognitive dimensions of wilderness privacy over an 18-year time frame where states of privacy were measured using a 20-item scale and 7-point continuum and analysed statistically at a 95% confidence interval.

Qualitative research best addresses the question – Why? "A qualitative approach is one in which the inquirer often makes knowledge claims based primarily on constructivist perspectives or emancipatory perspectives" (Creswell, 2003, p. 18). In contrast to quantitative research, qualitative research is contextual and emphasises detailed examinations of natural social conditions and authentic interpretation (Neuman, 2000). This type of research uses vastly different collection and analysis methods than quantitative studies. This qualitative framework has also been widely used, particularly in social science and recreational resource research. For example, Kyle and Chick (2002) used a qualitative ethnographic design to explain the social nature of leisure involvement and behaviour with respect to visitor motivation for repeat visitation to an agricultural fair and the focus of their involvement.

"With the development and perceived legitimacy of both qualitative and quantitative research in the social and human sciences, mixed methods research, employing the data collection associated with both forms of data, is expanding" (Creswell, 2003, p. 208). Research that is rooted in pragmatic knowledge claims often favours a mixed method strategy of inquiry. For a mixed methods researcher, "pragmatism opens the door to

multiple methods, different worldviews, and different assumptions, as well as to different forms of data collection and analysis in the mixed methods study" (Creswell, 2003, p. 12). Pragmatists are not committed to one philosophy of reality and therefore draw liberally from qualitative and quantitative assumptions to provide the best understanding of the research problem (Creswell, 2003).

Mixed method studies follow one of three basic strategies: (1) sequential – seeks to elaborate on or expand the findings of one method with another method, (2) concurrent – converges quantitative and qualitative data in order to provide a comprehensive analysis, or (3) transformative – uses a theoretical lens as an overarching perspective within a design that contains both quantitative and qualitative data. Several criteria have been identified for choosing a specific mixed method strategy (Creswell, 2003):

- Will qualitative and quantitative data be collected sequentially or concurrently?
- Will priority be given to qualitative or quantitative data collection and analysis?
- At what stage will the qualitative and quantitative data and findings be integrated?
- Will an overall theoretical perspective be used?

Mixed methods have been widely applied in recreation, education, and resource fields. For example, Egan *et al.* (1995) used survey, focus groups, and delphi techniques to assess the condition of harvested non-industrial private forests (NIPFs), evaluate the owner's forest management knowledge, and provide insight into the forest stewardship statements of NIPF owners. Bath (2004, 2003, 2002) used a mixed method strategy consisting of quantitative surveys and qualitative focus groups to explore the human dimensions of marten management issues on the Island of Newfoundland.

2.4.3 Survey research and *ex post facto* designs

Survey research design is mostly used to identify, describe, and quantify prevalence of trends, attitudes, beliefs, preferences, or self-reported behaviours, and in particular differences between groups of people in their attitudes, beliefs, preferences, knowledge, expectations, and self-reported behaviours (Creswell, 2003; Neuman, 2000; Riddick & Russell, 1999). Survey designs sample from the research population in an effort to generalise the results to the entire population (Creswell, 2003; Neuman, 2000). The design may be longitudinal – to measure changes in attitudes, beliefs, preferences, or self-reported behaviours over time, or cross-sectional – to measure differences between groups of people (Riddick & Russell, 1999). If the emphasis of an evaluative study is on causal propositions about these attitudes beliefs, preferences, and behaviours, then the survey becomes the vehicle for an *ex post facto* design (Riddick & Rusell, 1999).

An *ex post facto* design that focuses on causal proposition studies, observes, and describes the current condition and attempts to identify possible causes of that condition (Riddick & Russell, 1999). Survey research is often defined in terms of its approach and method. The following is a list of key points regarding the design of survey research (De Vaus, 1996):

- Surveys are not synonymous with a particular data collection technique but are distinguished by the form of data collection and method of analysis.
- Surveys are characterised by a structured or systematic set of data or "variable by case matrix" to collect data about the same variables from multiple cases.
- There are a variety of data collection techniques, however, the questionnaire is the most common technique since it is the easiest way to ensure a structured data matrix.
- Survey research not only describes cases but also seeks to identify and understand causal inferences by comparing cases.

- Survey research finds naturally occurring variation whereas experimentation creates and controls variation. The problem for survey researchers is that it is difficult to ensure cases are similar in variables other than the ones being investigated.
- The ideal-typical model of survey research does not necessarily equate to what is practiced by survey researchers. Survey research is affected by a number of attributes – research topic, technique of data collection, experience and personality of researcher.
- The primary goal of research should be to gain accurate understanding of the research question and use methods and techniques which enhance understanding.

Table 2.1 presents some of the most common criticisms of survey research as suggested by De Vaus (1996). These criticisms should be considered in the design of a research study. If the intent of the research is to infer cause and effect a researcher may consider an alternate design or opt for a stronger *ex post facto* design. A researcher must also carefully consider whether the conditions or variables under review are measurable by a survey technique. To address the issues of complexity in social interaction and context and human consciousness researchers may implement mixed or multiple methods within to best understand the phenomenon being studied.

Table 2.1
Common criticisms of survey research (De Vaus, 1996).

Common criticisms of survey research:
• Surveys can not establish causal connections.
• Surveys are incapable of getting at meaningful aspects of social action and do not examine the context in which beliefs and actions occur.
• Surveys assume human action is determined by external forces and neglects human consciousness.
• Some attributes are not measurable by surveys.
• Surveys are too restricted by structure.
• Survey research is sterile, ritualistic, requires no imagination or creative thinking.
• Survey research is empiricist, merely collects statistics and produces nothing of theoretical value. Surveys are too statistical and reduce interesting questions to numbers.
• Survey research is intrinsically manipulative, scientistic, and technistic.

While many researchers criticise survey research based on its quantitative, reductionist approach, Krosnick (1999, p. 560) suggests that "survey researchers are plotting their future with new visions and possibilities, because research is leading them to question old assumptions and to contemplate ways to improve their craft." He suggests that survey research methodology may be utilised to understand the workings of the human mind and the dynamics of social interaction (Krosnick, 1999).

Wellman and Fahmy (1985) suggest that citizen surveys are useful in natural resource planning and management, particularly since it provides a base of information that may be useful when applied to conflict resolution. Despite criticisms, survey research is widely applied to research in human dimensions and recreation and leisure research, particularly within the context of evaluative research. For example, Negra and Manning (1997) used survey research design to define environmental behaviours, ethics and values exhibited by visitors to the Vermont state park system. This pragmatic study used findings to develop principles for designing park-based environmental education programs.

2.4.4 Data collection methods

There are many methods that can be used within the context of evaluative research. Data collection methods, sampling strategies, and instrumentation must be carefully planned. The choice of specific tools will be defined not only by the framework and research design but also by the nature of the research problem, specific questions addressed by the

study, by the characteristics of the research population, and the resources available. The most common form of data collection used in evaluative research includes quantitative surveys, qualitative interviews, and focus groups. Two methods that are less popular, yet noteworthy, include participant observation and the Delphi process. The advantages and disadvantages of each method are discussed below. There are numerous data collection instruments that can be used within these methods such as structured questionnaires, semi-structured interview questions, and various types of observation forms.

There are three basic survey methods: mail, telephone, and face to face (Czaja & Blair, 1996). Although with the development, spread, and advancement of recent electronic technologies, web and e-mail surveys have become more widely used, although logistical problems still persist (Cook *et al*., 2000; Duda & Nobile, 2010; Litvin & Goh, 2001; O'Lear, 1996). The most common method of delivery is the mail-out questionnaire and may incorporate both open- and closed-ended questions (Riddick & Russell, 1999). Mail-out questionnaires, and more recently electronically collection questionnaires, are perceived as desirable since they can collect data from a large number of respondents even if they are geographically dispersed (Mangione, 1998). Generally, questionnaires are cost-efficient, ensure standardisation, and encourage response on sensitive issues (Goyder, 1985, Mangione, 1998).

Schleifer (1986, p. 22) identified that public attitudes towards survey research provide an obstacle to legitimate research, for example, he found that "disguised sales pitches

harmed survey researcher's reputations, raised the public's suspicions, and contributed to increased refusal rates." However, the most common criticism of surveys, particularly mail-out questionnaires, is low response rates. Dillman *et al.* (1974) illustrated that the mail method can produce high response rates, particularly if the topic has high saliency to the respondent (Brown *et al.*, 1989). Furthermore, there are a number of factors that may be manipulated to increase response rates (Dillman *et al.*, 1974; Goyder, 1985; Heberlein & Baumgartner, 1978). According to Fowler (1998), the design of survey questions is the most critical factor to the successful implementation of a survey research design and ensures error-free data and increased response rates. Despite the criticisms, survey methods are widely used to explore causal relationships with respect to social conditions. For example, Shaw *et al.* (1991) used data from the Canada Fitness Survey to explore relationships between constraints and participation in leisure activities.

Interviews have become a widely accepted and implemented method of evaluative research and may be used in a variety of settings (Neuman, 2000). According to Neuman (2000) survey interviewing is a specialised kind of interviewing; specifically, it is a social relationship involving social roles, norms, and expectations. Furthermore, "the interview is a short-term, secondary social interaction between two strangers with the explicit purpose of one person's obtaining specific information from the other" (Neuman, 2000, p. 274). Interviews are useful when it is impossible to observe participants and to collect historical information (Creswell, 2003). According to Kaplowitz and Hoehn (2001) individuals prefer the anonymity of the individual interview session and therefore

qualitative interviews may reveal insight absent from group effects, in fact, Kaplowitz and Hoehn (2001) emphasise that only in-depth individual interviews can undertake investigations independent of group effects. The greatest advantage of the interviewing technique is the ability of the interviewer to probe for more information; "a probe is a neutral request to clarify an ambiguous answer, to complete an incomplete answer, or to obtain a relevant response" (Neuman, 2000, p. 277). However, this method has several limitations; for example, information is gathered in a designated "place" rather than a natural field setting. Also the presence of the researcher may introduce biased responses (Creswell, 2003). It is therefore important that interviewers have a clear understanding of their role and receive proper training to eliminate possible biases (Neuman, 2000).

Interviews will always be indispensable for collecting data from certain populations, topics, questions, and in combination strategies (Goyder, 1985). Similar to questionnaires, there are also variations in interview methods; interviews may be conversational or structured, in person or through other media (Neuman, 2000; Veal, 1997). For example, Pitcher *et al.* (2003) conducted structured personal interviews with rural project leaders to identify and explore success factors in rural and community development initiatives. Interviews were conduced by electronic mail and phone. Archibald (1999) used face-to-face open conversation interviews to understand problems with environmental reporting in news media.

Focus groups have emerged as a powerful tool in the analysis of public values (Davies, 1999; DiCamillo, 1995). Focus groups may serve a variety of purposes. For example, they may provide a starting point for the design of a questionnaire or a means to explore the potential ways people talk about issues (Riddick & Russell, 1999). Focus groups can also obtain general information about a topic, generate research hypotheses, stimulate new and creative ideas, and confirm results collected by another data collection method (Neuman, 2000; Riddick & Russell, 1999; Stewart & Shamdasani, 1998). For example, Egan *et al.* (1995) found that focus groups gave insight into the meaning of questionnaire responses. Focus groups concentrate on generating data based on group effect, positive and negative (Kaplowitz & Hoehn, 2001).

Group interaction may stimulate ideas and discussion but may also focus on shared information as opposed to participants' ideas. One of the greatest strengths of this method is that it may be adapted to provide a desirable level of focus and structure (Riddick & Russell, 1999). There are however associated problems of dominant group members, peer-pressure, and group dynamics which may result in biased information. DiCamillo (1995) suggests that while focus groups jeopardise reliability and repeatability they increase understanding of public views with respect to a specific issue. According to Davies (1999) focus groups allow individuals to discuss a topic without feeling intimidated. However, the role of the moderator is critical to the effectiveness of the focus group (Davies, 1999; Riddick & Russell, 1999). Recognising that public participation may be instrumental in developing trust between citizens and public

institutions, Smith and McDonough (2001) used focus groups to evaluate fairness in natural resource decision making.

Simple observation is often overlooked by evaluative researchers; however, this method may be particularly useful for evaluating behaviour since people's action is central to any social inquiry (Riddick & Russell, 1999). Participant observation involves studying the actions of people from the vantage point of involvement with the research population; however, there are varying levels of involvement from complete participation to passive observation (Riddick & Russell, 1999). It is also important to note that observations can be analysed quantitatively or qualitatively (Veal, 1997). This method is best used to complement alternative methods or provide a context for data collected by another method. Observation can be used as the primary data collection method where description is the primary intent of the research (Riddick & Russell, 1999; Veal, 1997). Furthermore, the quality of the observation can be influenced by the quality of the investigator (Burch, 1974; Riddick & Russell, 1999). The primary disadvantage of the observation technique is that the researcher may be seen as intrusive (Neuman, 2000). Observation is best used to explore social behaviour or topics that may be difficult for participants to discuss. For example, Godbey and Blazey (1983) used observation techniques to examine aspects of local park usage by older urban residents such as on-site behaviour.

The Delphi Process, named after the classical Greek oracle of Delphi, provides an opportunity to gather, refine, and analyse expert opinion on various concepts and trends (Veal, 1997). This method can be particularly useful when studying technical or complicated issues. This method has also been used to assist in questionnaire design such as the choice of appropriate measures and terminology. For example, Egan *et al.* (1994) used the Delphi process to gather expert opinion to develop a credible tool that evaluated forest stewardship.

Researchers recognise that there are limitations and biases in any single method but that the biases of one method may cancel the biases of another (Creswell, 2003). The term triangulation is borrowed from navigation and military strategy and refers to a strategy that observes a condition from a variety of angles or viewpoints to get a fix on its true location (Neuman, 2000). A design that employs multiple methods may "forge valid propositions that carefully consider relevant rival causal factors" and to eliminate biases that arise from research that relies on only one research method, particularly when applied to poorly understood phenomenon (Egan *et al.*, 1994, p. 458). This type of triangulation (there are other forms of triangulation used in research) focuses on the triangulation of methods, that is, they take multiple measures of the same condition (Neuman, 2000). The purpose of triangulating methods is to verify and validate results from multiple data collection methods (Riddick & Russell, 1999).

Triangulation of methods, synonymous with a mixed method strategy, provides "a means for seeking convergence across qualitative and quantitative methods" (Creswell, 2003, p. 15). Egan *et al.* (1994) suggest that the integration of techniques may provide insights generally not present in any single method. Kaplowitz and Hoehn (2001) point that one collection method is not necessarily better than the other (in this case interviews and focus groups) rather they are complementary. The purpose of a mixed method framework, used interchangeably with triangulation of methods, is to integrate both quantitative and qualitative methods to explore and explain phenomenon (Neuman, 2000). Triangulations are widely implemented in social science research. For example, a triangulation of methods was used in a cross-sectional study of body image differences between African American and Caucasian adolescent females (Parker *et al.*, 1995). While the research problem is vastly different from a human dimensions study on national park issues, the design is remarkably transferable; data from the qualitative ethnographic methods were used to provide further explanation for quantitative survey findings.

Chapter Two, *Literature Review*, has presented the current literature relevant to the application of social science methods in national parks. The review suggests that there are many ways that people value natural and protected areas, ranging from human-centred values such as a perceived economic benefit to earth-centred values such as protecting ecological integrity. Experiences that are tied to these fundamental values are likely to have a greater impact on formulating positive attitudes and values towards national parks.

Furthermore, experiences facilitated through interpretation programming can have a positive impact on learning and transfer of knowledge in national parks. In fact, a positive learning environment, as offered through interpretation programs, not only increases knowledge but also can help foster positive attitudes and instil positive values. In this way, interpretation has the power to increase understanding of cultural and natural history as it relates to national parks. Interpretation programs that are carefully crafted within the construct of experiential education and employing deliberate metaphors and strategic use of facilitation techniques will be able to create the strongest connection between the audience's everyday lives and the natural experience.

This review has also identified that research that addresses the social science needs within national parks has been limited but is needed for both academic and practical reasons. The utility of social science research is paramount since researchers have noted that interpretation efforts are focusing more and more on influencing attitudes and eliciting positive responses in support of park values. Given the range of alternative approaches and methods, selection of the appropriate set of methods for this research is critical. This will be the focus of the following section, Chapter Three, *Methodology,* which presents the methods chosen and outlines details relating to the implementation of methods and various statistical techniques used during data analyses.

3.0 Methodology

The best design for any given research problem must consider the strengths and weaknesses of various methodologies, how they have been previously applied, and the appropriateness with respect to the research question(s). Chapter Three presents the methodology that was implemented to best address the research questions, achieve the goals and objectives of this evaluative study, and best facilitate an understanding of the three main interpretation themes: (1) visitor and community understanding of the national park system, (2) Terra Nova National Park's (TNNP) educational messages, and (3) issues threatening ecological integrity within TNNP. This chapter describes the methodology used to answer these questions and meet the objectives outlined in Chapter One, including an outline of the overall design of the research study, a discussion of the data collection instrument and method of delivery, a description of the research population and sampling techniques employed, and an explanation of data analysis procedures and considerations for reliability and validity.

3.1 Research design

This study employed a survey research strategy focusing on quantitative methods. This strategy was selected through the examination of all current literature on evaluative research. One of the strengths of this design is its straightforwardness and ease of implementation, the design was adapted from Dillman (1978, 2000).

This human dimensions study was explored through a non-experimental survey research design that emphasised description to document knowledge and attitudes. The survey was implemented following guidelines provided by Neuman (2000) and Creswell (2003). This was particularly appropriate since baseline data were established for future comparison; such longitudinal studies will allow for continual evaluation and monitoring of knowledge levels demonstrated by various park audiences. A cross-sectional survey design allowed for direct comparison between key audiences, visitors and community residents.

3.2 Data collection instrument

A twelve-page booklet-fold questionnaire was designed to collect data from both key research populations: residents in communities adjacent to Terra Nova National Park and repeat visitors to the park (Appendix A). The questionnaire was divided into three main sections corresponding to the three main interpretation themes: (1) understanding of the national park system, (2) understanding the role of TNNP, and (3) understanding with respect to ecological integrity issues in TNNP. A total of 170 items measuring knowledge, attitudes, and values, were designed in consultation with park management and following the suggested guidelines outlined by Czaja and Blair (1996) and Converse and Presser (1986). Most items were closed-ended and easily quantifiable. The survey was pre-tested prior to data collection by peers, social science specialists, and park managers. However, due to time constraints, a proper pilot study was not completed.

3.3 Data collection methods

Data collection, completed during summer 2004, targeted two research populations, representing the most critical park audiences - (1) repeat visitors and (2) residents of local communities as directed by the Engaging Canadians External Communications Strategy for Parks Canada (2001). Repeat visitors were defined to include park visitors who spent at least 14 nights per year in one of the park's campgrounds, this population consisted of 952 visitors as presented in a 2003 camper database provided by park staff. Local residents were defined as residing in one of the 12 communities within the greater park ecosystem and identified as "liaison communities" by Parks Canada. The communities collectively represent a population of 5,180, according to the most recent census data from 2003. Research populations were studied using quantitative survey methods (Table 3.1). Identical quantitative questionnaires were applied to residents and visitors.

Table 3.1
Quantitative methods implemented for each research population.

	Local residents	**Repeat visitors**
Population Size	5180 (2003 Census data)	952 (2003 Park database)
Data Collection	Mail-out to 755 residents	Mail-out to 695 visitors
Instrument	Questionnaire	Questionnaire
Sampling Strategy	Systematic random; stratified by community; proportional to community size; Source: telephone directory; Pre-notice phone calls; 290 reminders sent to random addresses	Systematic random; Source : 2003 park data base of repeat campers spending at least 14 nights in the park during the year; 185 reminders sent to random addresses
Returned surveys	N = 214 (205 usable)	N = 154 (150 usable)
Response Rate	28%	22%
Success rate of Reminders	14%	4%

Repeat visitors were sampled using a systematic sampling of 2003 park databases on repeat visitation. Questionnaires were mailed to 695 visitors, yielding a 22% response rate and a sample size of 150 usable surveys. Reminders were sent to a random sample of 185 visitors; only 4% of visitors who received the reminder returned the survey, (included in the overall sample size of 150 surveys). The response rates are lower than documented in previous social science studies with similar audiences in TNNP.

Local communities were sampled using a stratified strategy to obtain a sample population proportional to the population for each community within the greater Terra Nova Ecosystem. Replies were representative of the liaison communities; proportional representation by community is shown in Table 3.2. For example, Burnside-St.Chad's represented 4.3% of the total research population and represented 2.5% of the final research sample, yielding a discrepancy of -1.8%. Community residents were systematically selected from the 2004 telephone directories. Pre-notification phone calls were made to confirm addresses and willingness to complete the survey. The refusal rate of people not willing to receive the survey was approximately 15%. Questionnaires were mailed to 755 confirmed addresses, which yielded a 28% response rate and a sample size of 205 usable cases. Reminders were sent to a random sample of 290 residents; 14% of residents receiving reminders returned the questionnaires (included in the overall sample size of 205 surveys).

Table 3.2
Comparing community representation from the research population and the resultant research sample.

Community	Representation (%)		Discrepancy
	Population	Sample	
Burnside-St.Chad's	4.3	2.5	- 1.8
Charlottetown	6.7	6.4	- 0.3
Cull's Harbour	4.3	1.0	- 3.3
Eastport	9.9	12.6	+ 2.7
Glovertown	41.8	49.0	+ 7.2
Happy Adventure	4.7	5.9	+ 1.2
Port Blandford	11.1	6.9	- 4.2
Salvage	2.9	3.4	+ 0.5
Sandringham	5.1	4.4	- 0.7
Sandy Cove	3.9	2.0	- 1.9
Traytown	5.3	5.9	+ 0.6
Total	100.0	100.0	

3.4 Data analysis

All data analyses were performed using the Statistical Package for the Social Sciences (SPSS 12.0 for Windows). The analysis was divided into two separate stages: univariate and multivariate analyses. The univariate analyses offers a descriptive presentation of results while the multivariate analyses attempts to better understand the nature of the results using specific statistical analyses to add value to the descriptive results by demonstrating the statistical significance of results.

Chapter 4, *Understanding of park themes by park audience*, presents the outcomes of all analyses performed on individual variables as presented to the respondents in the

questionnaire. This strategy was selected to evaluate the understanding of specific park messages identified in one of the three themes: understanding of Canada's national park system, local perspectives in TNNP, and understanding of ecological integrity issues in TNNP, as outlined in the objectives in Chapter One.

Prior to the analyses, data were edited and reviewed for entry errors and to ensure proper coding. Data were checked for normality using the Shaprio-Wilkes test of normality; based on large sample sizes the assumption of normality is accepted. Frequency distributions were produced for each survey item and data were analysed using descriptive statistics including mean scores and standard deviations to explore and document visitor and community understanding of national parks from a national, local, and ecological perspective. To compare visitor and community scores on attitudes, values, and knowledge and determine if any apparent differences are real or simply due to sampling effects, independent samples t Tests were computed at the .05 level of significance. Levene's Test for Equality of Variances was employed to consider instances where equal variances could not be assumed statistically.

The second stage of the analysis explored the data using three multivariate statistical methods: Principal Component Analysis (PCA), discriminant function analysis, and binary logistic regression. The results from the Multivariate analyses are presented in Chapter 5, *Toward a better understanding of visitor and resident perceptions*. Prior to analyses, nominal data were removed from the data set and the remaining ordinal and

scale data was standardised. Multivariate outliers were eliminated using Mahalanobis distance at $p < .001$ as the criterion for removal. All models excluded outliers where Mahalanobis distances were greater than χ^2 for given degrees of freedom. Specific outcomes are reported for each of the research themes in Chapter 5.

3.4.1 Principal Component Analysis

Principal Component Analysis (PCA) was performed for each of the three research themes. According to Tabacknick and Fidell (2007), PCA is the solution of choice for researchers who are primarily interested in reducing a large number of variables down to a smaller number of components and where there may be a high degree of correlation between variables. PCA is a statistical technique applied to a single set of variables to determine which variables in the set form coherent subsets that are independent of one another by using correlations among variables to develop a small set of components (supervariables) that empirically summarise the correlations among variables (Tabacknick & Fidell, 2007). Components are thought to reflect underlying processes that have created the correlations among variables. In this study the specific goal of PCA was to summarise patterns of correlations among observed variables and reduce a large number of observed variables to a smaller number of components.

Steps taken during the PCA included the selection and measurement of variables, preparation of a correlation matrix, extraction of a set of components from the correlation matrix, determination of the number of components, rotation of the components to

increase interpretability, and interpretation of results. According to Tabachnick and Fidell (2007), 300 cases provide a good sample size for PCA - in this study the total sample size was 354. A matrix that is factorable should include several sizable correlations (interpretable r values > +/- .30); in this case, there were multiple correlations exceeding .30 in the observed correlation matrix. Outliers among variables were also screened out using the Mahalanobis criterion.

Multicollinearity was not a concern for PCA because there was no need to invert the matrix (Tabacknick & Fidell, 2007). Most of the values in the anti-image correlation matrix were sufficiently small, indicating a reliable PCA. Kaiser's measure of sampling accuracy is a ratio of the sum of squared correlations to the sum of squared correlations plus the sum of squared partial correlations. The value approaches one if partial correlations are small, values of 0.6 and above are required for a reliable PCA. Values were greater than 0.6 for each model. Principal components extraction with varimax rotation was used to maximise the variance of component loadings by making high loading components higher and low factors lower. Repeat visitors and community residents were not dichotomised for this analysis.

PCA has considerable utility in reducing numerous variables down to a few components. Mathematically, PCA produces several linear combinations of observed variables, each linear combination is a component. The components summarise the patterns of correlations in the observed correlation matrix. When scores on components are

estimated, they are often more reliable than scores on individual observed variables (Tabacknick & Fidell, 2007). Components are simply aggregates of correlated variables; there is no underlying theory about which variables should be associated with which factors, they are simply empirically associated. Labels applied to derived components are based on appropriate descriptions of the combinations of variables associated with them, and do not necessarily reflect some underlying process. The principal components are ordered, with the first component extracting the most variance and the last component the least. Since the components are orthogonal their use in other analyses may greatly facilitate interpretation of results. The components derived from the PCA were used in the subsequent binary logistic regression and a confirmatory discriminant function analyses for each park theme.

3.4.2 Binary logistic regression

This binary logistic regression allows one to predict a discrete outcome such as group membership from a set of variables that may be continuous, discrete, dichotomous or mixed (Tabachnick & Fidell, 2007). Logisitic regression is more flexible than the other techniques as it does not formulate assumptions about the distributions of the predictor variables. Therefore, variables do not have to be normally distributed, linearly-related or equal variance within each group, and can not produce negatively predicted probabilities. There may be two outcomes (groups) that may or may not have order. Logisitic regression emphasises the probability of a particular outcome for each case. In this study

logistic regression was used primarily to evaluate odds (probability) of membership in one of the groups based on the combination of values of the predictor variables.

The interpretation of coefficients using odds was selected to further explore and document differences between the two main park audiences. The odds ratio represents the change in probability of being in one outcome group when the value of the predictor changes by one unit. The co-efficients (β) are the natural logs of the odd ratios. An odds ratios greater than one reflects an increase in odds (greater than chance) and a ratio less than one indicates a decrease in odds (less than chance). For example, an odds ratio of 1.5 would indicate that the case in question was 1.5 times as likely to be a member of the outcome group that was coded as "one" with a one unit increase in a given predictor; that is the odds are increased by 50 percent. An odds ratio of 0.8 would indicate a 20 percent decrease in odds. Goodness of fit models were computed to test the effect of the overall model using Wald Statistics, -2 log likelihoods, Nagelkerke R squared values, Cox and Snell R squared values, and the Hosmer Lemeshow test.

3.4.3 Discriminant function analysis

In this study, discriminant function analysis provided a confirmatory analysis of the classification produced by the results of the binary logistic regression. Discriminant function analysis evaluates how variables contribute to the total relationship but not to any one predictor. Traditionally, this analysis is used in predicting group membership from a set of variables and when independent variables are continuous and normally

distributed (Tabacknick & Fidell, 2007). The discriminant analysis is a one-way statistical process that predicts the dependent variable from the independent variables and suggests whether or not group membership has been predicted reliably. In this case, the primary purpose of applying the discriminant function methods was to understand the dimensions along which the two sample populations differ and evaluate how well the classification procedure describes the research populations. That is, the emphasis was on the interpretation of results in terms of combinations of predictors. Interpretation of results focused on the component structure and the dichotomy of Fisher's linear co-efficients, which highlighted differences between the two research populations for each component.

There were over 100 cases per group; Tabachnick and Fidell (2007) suggest that sample sizes greater than 20 cases are large enough to suggest normality of sampling distributions and the smallest sample size (150) does exceed the number of predictor variables (6). Multivariate normality posed no difficulty since tests for discriminant analysis are robust to failures of normality if the violation is caused by skewness rather than outliers (Tabacknich & Fidell, 2007). SPSS, used for major analyses, protects against multicollinearity through checks of tolerance and so no formal evaluation was necessary. Wilks' Lambda is a likelihood ratio statistic that was used to test significance of the main effects and interactions between predictors.

4.0 Understanding of Park Themes by Park Audiences

Chapter Four presents descriptive results (univariate results) as well as comparative measures between group means for each of the three themes of the research study: (1) understanding Parks Canada, (2) local perspectives in Terra Nova National Park, and (3) understanding of ecological issues in Terra Nova National Park. These three themes, as earlier stated, represent the key messages delivered through park interpretation programs. The results presented in this section are based on individual variables measured using the data collection instrument. This section presenting the results of univariate analysis represents the research commissioned by Terra Nova National Park to facilitate understanding of the research outcomes and to identify individual messages that are poorly understood among park audiences.

Before presenting the results for each research theme it is important to present demographic information and consider possible biases, including age and gender, presented by differences between groups. The mean age among visitors was 46 years old (SD = 15.87), ages ranged from 18 to 75. The co-efficient of variation showed 34% variability within this group. The mean age among residents was 53 years old (SD = 10.13), ages ranged from 18 to 85 years. The co-efficient of variation showed 19% variability among this group. This shows greater variability in the ages of visitors. The difference between the means was significant at $t(326) = 4.98$, $p < .01$.

The gender profiles for communities and visitors were strikingly different. The visitor research sample was comprised mostly of males (72%) and only 28% were female as the mail-outs were addressed to the names in the database. The resident research sample was comprised mostly of females (57%), 43% were male. Given the marked difference, a binary logistic regression following the exact parameters used in the multivariate analysis in Chapter 5 (except using male/female classification as opposed to repeat visitor/local resident) was run to look for any differences in response that may have been attributed to gender. The regression was based on the principal components extracted from the multivariate analysis that is presented in Chapter 5. There were no significant differences based on gender so we may infer that statistically significant differences in both univariate and multivariate analysis result from classification as a repeat visitor or local resident and not attributable to gender differences.

4.1 Understanding Canada's national park system

The first section of the survey focused on knowledge of and attitudes towards the system of national parks in Canada. All of the visitors and 98% of residents had heard of *Parks Canada.* The mean number of national parks that visitors believed to exist in Canada was 32 and ranged from 10 to 56, while residents indicated on average 29 national parks, and ranged from 1 to 60. Half (50%) of both groups could identify the number of national parks within plus or minus 10 of the correct answer (at the time of the survey there were 41 national parks).

Respondents were then questioned as to whether they believe there were enough national parks in Canada. Many visitors, 39%, indicated that there were not enough parks, while most residents, 50%, were unsure. Very few respondents indicated that there were too many, only 2% of visitors and 3% residents.

Respondents were asked basic knowledge questions on the system of national parks in Canada. Figure 4.1 shows the percent of visitors and community respondents that were able to answer the set of true or false questions correctly. For example, 92% of visitors identified that Parks Canada is responsible for the management of national historic sites as compared to 76% of residents. Less than half of visitors and residents understood that the national parks system is incomplete, in fact, 29% of visitors and 15% of residents chose false. Less than 15% recognised that as an incomplete system, not every natural region is currently represented by a national park. Only 52% of residents and 70% of visitors identified that national parks have not been privatised. Many people are still not aware of the inclusion of national marine conservation areas in the Parks Canada Agency, while most recognised that Parks Canada is a federal government institution. Visitors exhibited marginally higher knowledge levels on each statement regarding the national park system; residents demonstrated uncertainty. Significant differences showed greater knowledge among visitors on three variables: (1) Parks Canada is also responsible for National Historic Sites (NHS) ($t(335) = -3.30$, $p < .05$), (2) national parks are managed by their respective provincial governments ($t(290) = -4.55$, $p < .05$), and (3) national parks have been privatised ($t(331) = -3.32$, $p < .05$).

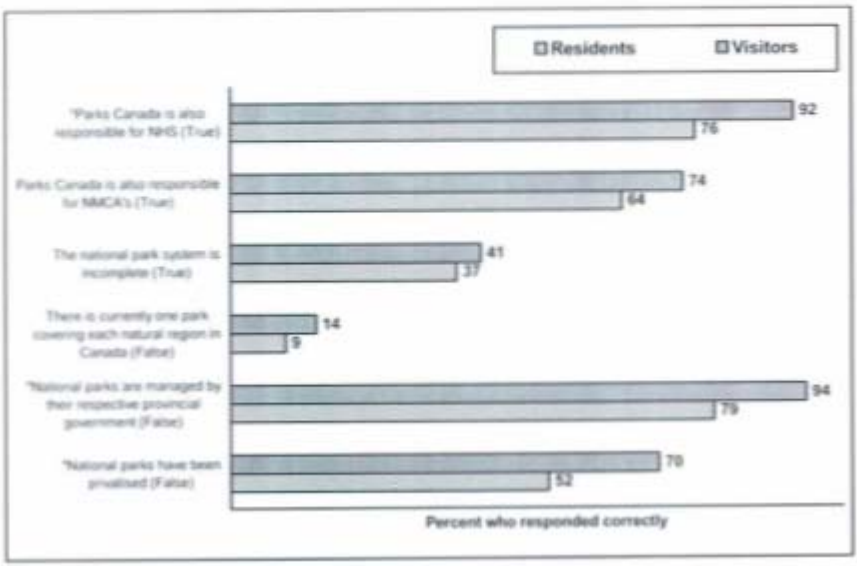

Figure 4.1
*Comparing visitor and resident knowledge about the system of national parks using 3 point scale where -1 = incorrect response and 1 = correct response (*t-Tests revealed significant differences between mean responses at p < .05).*

Respondents were then asked to name 5 national parks in Canada. Of the visitors, 38% were able to name 5 national parks in Canada in comparison to 31% of residents; 11% of visitors and 15% of residents did not attempt to identify one national park. Differences between the two groups on mean response were not significant at $t(102) = -.351$, $p > .72$. Table 4.1 shows the most identified parks by visitors and residents. For example, 87% of visitors and 82% of residents identified Terra Nova National Park and 85% of visitors and 80% of residents identified Gros Morne National Park. The next most identified parks for both visitors and residents were, from highest to lowest, Banff, Jasper, Fundy, and Cape Breton. Speculatively, Kejimkujik was more often identified by visitors as a

result of a new summer ecopal program that partnered with Kejimkujik National Park and National Historic Site with Terra Nova National Park to learn about species at risk in 2004. Also, 6% of both visitors and residents identified Algonquin Provincial Park in Ontario as a national park.

Table 4.1
Comparing the most identified national parks by visitors and residents.

Visitors	**%**	**Residents**	**%**
TNNP	87	TNNP	82
Gros Morne	85	Gros Morne	80
Banff	62	Banff	55
Jasper	37	Jasper	38
Fundy	31	Fundy	21
Cape Breton	16	Cape Breton	7
Kejimkujik	15	**Algonquin**	6
Prince Edward Island	8	Point Pelee	6
Algonquin	6	Wood Buffalo	5
Glacier	4	Glacier	4

Figure 4.2 illustrates visitor and resident knowledge about the role of national parks and of the Parks Canada Agency's mandate; participants were given a series of true and false statements about Parks Canada. The figure shows the percentage of visitors and residents who responded correctly. For example, it is not the role of Parks Canada to create employment in local communities (although this may be a "by-product," it is not a role); only 38% of visitors and 28% of residents could correctly identify this statement as false. The majority of visitors and residents correctly identified statements that reflect Parks Canada's true mandate. For example, participants recognised that it is Parks Canada's role to ensure the ecological integrity of Canada's ecosystems for future generations, protect natural processes, represent nationally significant examples of Canada's natural

heritage, and foster public understanding, appreciation, and enjoyment. However, there is some uncertainty and misunderstanding regarding what national parks represent; only 60% of visitors and 56 % of residents understood that national parks are representative of one of the 39 natural regions of Canada and many participants indicated that the role of national parks was to represent provincial ecosystems. There were other roles that were also poorly understood; only 66% of visitors and 57% of residents identified the protection of Canada's cultural heritage as a role of Parks Canada. Visitors and residents perceive that ensuring camping facilities meet the needs of Canadians and developing tourism in local communities are roles of Parks Canada. On most statements, visitors showed marginally higher understanding than residents.

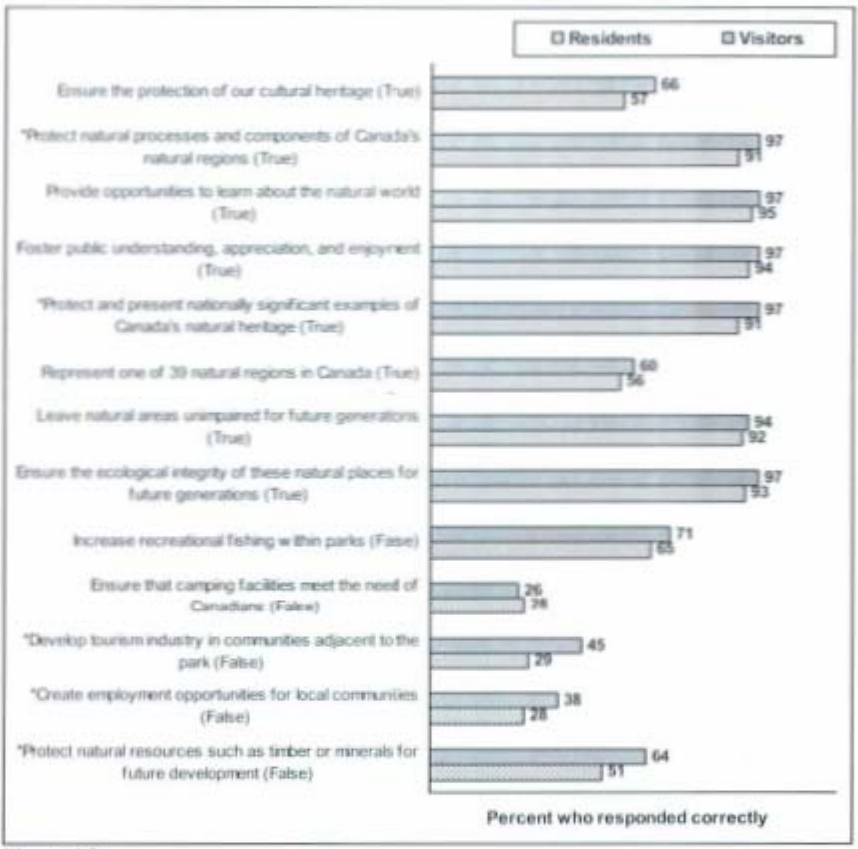

Figure 4.2

*Comparing visitor and resident knowledge about the roles of Parks Canada using a 3 point scale where -1 = incorrect response and 1 = correct response (*t-Tests revealed significant differences between mean responses at $p < .05$).*

While there is a lack of clarity about the roles of Parks Canada, both visitors and community residents understand the priorities for Parks Canada, that is, the roles which are most important to fulfilling their mandate. Table 4.2 lists the most important roles of the Parks Canada Agency identified by visitors and residents. The four roles that were

viewed as most important were the same for both visitors and residents, although in slightly different order. From the roles listed in Figure 4.2, visitors and residents both identified the maintenance of ecological integrity as the most important role of national parks. Respondents also identified protecting natural processes, representing nationally significant samples of Canada's natural heritage, and ensuring that natural areas are unimpaired for future generations as critical roles of Parks Canada.

Table 4.2
Comparing the most important roles of Parks Canada as perceived by visitors and residents.

Visitors	**%**	**Residents**	**%**
1. Ecological integrity	38	1. Ecological integrity	31
2. Nationally significant examples	17	2. Natural processes	17
3. Natural processes	11	3. Unimpaired for future generations	15
4. Unimpaired for future generations	8	4. Nationally significant examples	10

Figure 4.3 illustrates attitudes toward protected areas and national parks; it demonstrates the percentage of visitors and community residents that indicated agreement with a series of statements concerning national park management and objectives. Despite a generally positive attitude towards national parks objectives and mandates, there are several areas of concern that warrant attention. Visitors showed consistently and significantly more positive attitudes than residents.

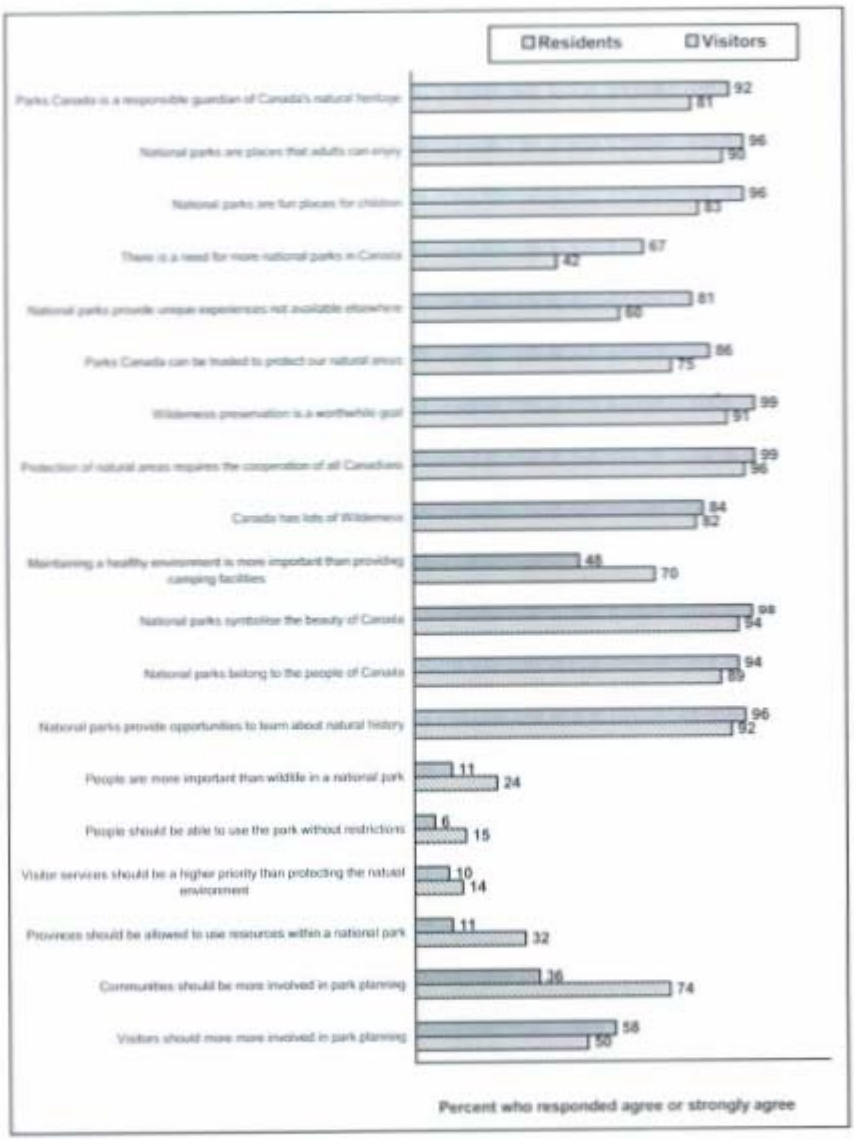

Figure 4.3

Comparing visitor and resident attitudes towards national parks using a five point scale where 1 = strong disagreement and 5 = strong agreement.

Table 4.3 documents the statistically significant differences between the mean responses of visitors and residents on attitudinal indicators toward national parks. The majority of respondents, 99% of visitors and 91% of residents agreed that wilderness preservation is a worthwhile, although visitors were significantly more in agreement than residents ($t(329) = -3.71$, $p < .05$). Most visitors and residents agreed that national parks: provide unique experiences not available anywhere else, are fun places for children, places that adults enjoy, provide opportunities to learn, belong to the people of Canada, and symbolise the beauty of Canada, although visitors were significantly more in agreement than communities ($t(326) = -5.28$, $p < .05$; $t(336) = -6.16$, $< .05$; $t(335) = -5.66$, $< .05$; $t(325) = -3.29$, $p < .05$; $t(333) = -2.66$, $p < .05$; $t(332) = -2.28$, $p < .05$). Visitors and residents also believed that Parks Canada is a responsible guardian of Canada's natural history and can be trusted to protect our natural areas, although visitors exhibited significantly more positive responses than communities ($t(330) = -3.27$, $p < .05$; $t(329) = -3.30$, $p < .05$). These differences are likely a result of an increased sense of ownership as a result of in-park experiences, educational programming, and the natural connection experienced during time spent in the park.

Table 4.3

Independent samples t Tests comparing attitudes between visitors and residents toward national parks, using a 5-point scale where 1 = strongly disagree and 5 = strongly agree.

Attitudinal indicator	Mean Score		*df*	*t*	Sig.
	Visitors	Residents			
Positive survey items					
Canada has lots of wilderness	4.09	3.94	331	-1.44	.14
Protection of natural areas requires co-operation of all Canadians	4.63	4.52	329	-1.48	.14
Wilderness preservation is a worthwhile goal	4.61	4.35	329	-3.71*	.00
Parks Canada can be trusted to protect our natural areas	4.17	3.87	329	-3.30*	.00
National Parks provide unique experiences not available anywhere else	4.04	3.49	326	-5.28*	.00
There is a need for more National Parks in Canada	3.87	3.33	333	-4.93*	.00
National Parks provide opportunities to learn about natural history	4.30	4.07	325	-3.29*	.00
National Parks are fun places for children	4.47	3.99	336	-6.16*	.00
National Parks are places that adults can enjoy	4.50	4.08	335	-5.66*	.00
National Parks belong to the people of Canada	4.42	4.19	333	-2.66	.01
National parks symbolise the beauty of Canada	4.48	4.28	332	-2.87*	.00
Maintaining a healthy environment is more important than providing camping facilities	3.40	3.81	291	3.74*	.00
Parks Canada is a responsible guardian of Canada's natural heritage	4.22	3.96	330	-3.27*	.00
Negative survey items					
Provinces should be allowed to use resources within a national park	2.02	2.75	328	5.76*	.00
People should be able to use parks without restrictions	1.70	2.17	333	4.18*	.00
Visitor services should be a higher priority than protecting the natural environment	2.32	2.35	335	.28	.78
People are more important than wildlife in a national park	2.22	2.49	324	2.14*	.03
Neutral survey items					
Visitors should be more involved in park planning	3.57	3.35	333	-2.12*	.03
Communities should be more involved in park decision-making	3.14	3.83	334	6.47*	.00

* significant at $p < .05$

It is interesting to note from Table 4.3 that visitors and residents varied in their opinions towards involvement in park planning processes; 58% of visitors and 50% of residents agreed that visitors should be more involved in park planning, while 36% of visitors and 74% of residents agreed that communities should be more involved in park planning. The differences between the means on both indicators are significant and in favour of each respective group at $t(333) = -2.12$, $p = < .05$ for the former and $t(334) = 6.47$, $p < .05$ for the latter. Visitors and residents both perceive themselves to be more important than the other in park planning with residents demonstrating a stronger desire to be involved than visitors.

There are a few areas of concern. Consistent with the aforementioned lack of understanding of the systems plan and the significance of national parks, only 67% of visitors and 42% of residents believed there is a need for additional national parks. The mean response for residents was significantly lower than visitors, $t(333) = -4.93$, $p < .05$. While most respondents understood the most important roles of Parks Canada there were some respondents who agreed that people are more important than wildlife in a national park and that visitor services are more important than protecting the natural environment, only 48% of visitors and 70% of residents indicated that maintaining a healthy environment was more important than providing camping facilities. Interestingly, this is the only positive attitudinal indicator on which communities scored significantly higher than visitors, $t(291) = 3.71$, $p < .05$. This difference may relate to perceived geographies and core values (discussed below). This clearly highlights a strong value on the

recreational use of parks by visitors who are immersed within the parks daily operators and visitor services activities. Communities see themselves as "outliers" of the park system, excluded from an area designated for the protection of environment and largely unfamiliar with the recreation use and visitor services offered in the park.

Although most respondents understood the role of parks in protecting ecological integrity for future generations, 11% of visitors and 32% of residents agreed that provinces should be allowed to use resources within national parks; these differences were statistically significant at $t(328) = 5.76$, $p < .05$. Furthermore, while most people seem to understand the need for restrictions in national parks, significantly more residents than visitors agreed that people should be able to use the park without restrictions, $t(333) = 4.18$, $p < .05$. As noted in the literature review, previous to the establishment of the park, TNNP was used for timber development and was traditionally used by communities in the area for domestic timber harvest and berry picking. For many residents, these activities are still remembered and many do not agree with the restrictions that accompanied the protection of the area as a national park.

Visitors and residents were given a set statements representing values or uses of national parks and asked to rate their importance to Canadians. These values included: recreational, spiritual, cultural, therapeutic, aesthetic, protection, scientific, educational, solitude, intellectual, moral, economic, and resource values. Figure 4.4 shows the most important values of national parks as perceived by visitors and residents. National parks

appear to be most valued for their protection of nature and living things as a means of ensuring our own survival, for the opportunity to recreate outside of familiar routines, and as a place to appreciate the beauty of nature. Visitors also acknowledged a moral obligation to respect other living things and value the learning opportunities provided within national parks. Residents responded similarly to visitors: protection, aesthetics, and recreation. Residents perceived the national parks to be valued by Canadians because of the resource value of the land – protection of resources such as timber and minerals for society to develop in the future, further complementing their belief that provinces (and by extension the residents of those provinces) should be able to use the resources in national parks. Recreational use was more important to visitors than community residents. The importance of this core value of national parks adds explanation to why visitors perceived camping facilities and potentially other visitor services to be of greater importance than maintaining a healthy environment in national parks.

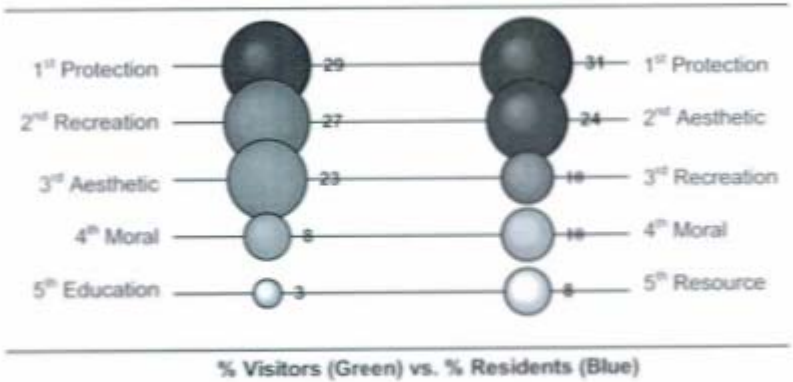

Figure 4.4
Comparing the values of national parks that visitors and residents rank as being the most important to Canadians.

Visitors and Residents were also asked to identify the most important values of national parks to themselves. There were several significant differences between the values of visitors and residents. Table 4.4 shows t Test results between mean value scores for visitors and residents. Visitors perceived significantly higher importance of recreational ($t(272) = -7.76$, $p < .05$), therapeutic ($t(327) = -3.72$, $p < .05$), aesthetic ($t(336) = -2.31$, $p < .05$), educational ($t(301) = -3.27$, $p < .05$), solitudinal ($t(324) = -2.41$, $p < .05$), and intellectual ($t(323) = -2.93$, $p < .05$) values than residents. Residents perceived significantly higher importance of religious ($t(318) = 3.21$, $p < .05$), economic ($t(323) = 4.07$, $p < .05$), and resource ($t(325) = 3.16$, $p < .05$) values than visitors.

Table 4.4
Independent samples t Tests comparing visitor and resident values of national parks, using a linear scale, from 0 to 13.9 where 0 = not valued and 13.9 = highly valued.

	Mean Score		*df*	*t*	Sig.
Value	**Visitors**	**Residents**			
Outdoor recreation	11.25	8.54	272	-7.76*	.00
Religious or spiritual matters	3.07	4.53	318	3.21*	.00
Cultural knowledge	8.95	9.18	325	.543	.59
Physical health and well-being	10.63	9.29	327	-3.72*	.00
Appreciation of the beauty of nature	11.68	11.22	336	-2.31*	.02
Protection of the environment	11.31	11.12	334	-.68	.48
Scientific research and study	10.41	10.75	330	.94	.35
Learn about nature	11.54	10.72	301	-3.27*	.00
Personal reflection and solitude	9.62	8.53	324	-2.41*	.02
Somewhere to think and contemplate	9.22	7.84	323	-2.93*	.00
Respect other living things	11.11	11.22	330	.334	.74
Enhance the economy	6.25	8.33	323	4.07*	.00
Source of resources for society to use	7.12	8.77	325	3.16*	.00

* significant at $p < .05$

4.2 Local perspectives in Terra Nova National Park

Visitors and residents were asked to respond to several questions concerning the roles and objectives of Terra Nova National Park (TNNP). The first question posed a series of true and false statements to see if participants could correctly identify the key roles of TNNP within the parks system. Figure 4.5 illustrates the percentage of visitors and residents that identified the statements as true. For example, 47% of visitors and 71% of residents correctly identified that it is not TNNP's role to provide first-class golfing opportunities (this item was included as park staff believed that it was a common misconception that the Park administered the golf course). Visitors showed higher levels of knowledge than residents on every statement with the exception of one. There is a

clear misunderstanding regarding marine protection in TNNP. TNNP is a terrestrial park that does protect the intertidal zone between land and sea but does not currently have a marine component; 88% of visitors and 73% of residents incorrectly identified the statement "TNNP protects the sheltered ocean environment" as true. Visitors were less likely to correctly identify this statement as false.

Visitors and residents clearly identified a number of roles of TNNP. At least 80% of visitors and residents identified that providing learning experiences, fostering the enjoyment of Canadians, representing a unique natural area of Canada, protecting habitat and the creatures that live there, maintaining the boreal forest ecosystem, and protecting ponds, bogs, and wetlands as roles of TNNP. When presented with a number of statements representing ecosystems that TNNP does not protect, respondents had difficulty identifying the false statements correctly. For example, only 29% of visitors and 17% of residents identified that TNNP does not protect tundra vegetation, furthermore, only 50% of visitors and 43% of residents identified that TNNP does not protect the Long Range Mountains rising abruptly from coastal plains. Visitors were more likely to recognise these statements as false. These findings illustrate a lack of awareness regarding the ecosystem that TNNP protects and further supports a "disconnect" between residents and the Park. This may suggest that interpretation outreach has not been effectively communicating messages to residents, or equally that there may be a lack of interest in the park from residents. There was a large number of visitors and residents who believed that TNNP plays a role in development of timber

resources (47% of visitors, 60% of residents), fisheries (48% of visitors and 62% of residents), and other economic development initiatives in communities adjacent to the park (37% of visitors and 48% of residents). While spin-off economic opportunities do exist in the park and adjacent communities, this is not the role of TNNP. These findings are consistent with visitor and resident values and attitudes presented earlier in the text.

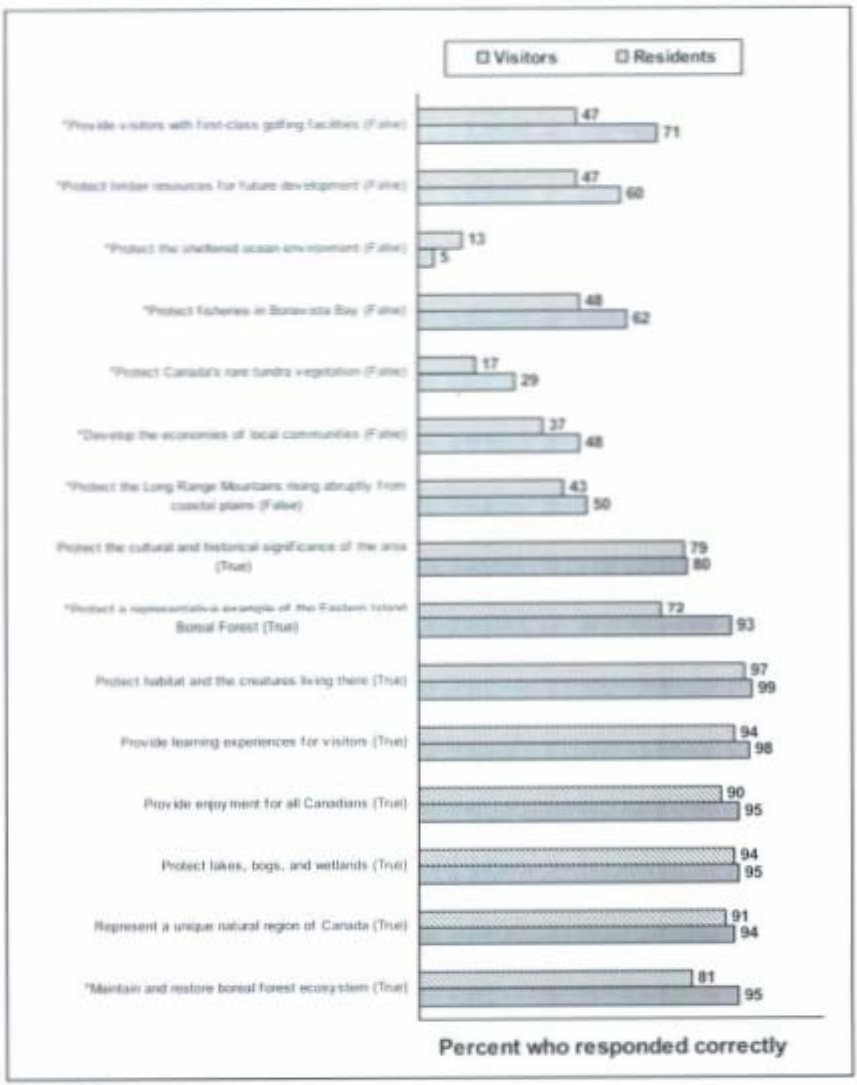

Figure 4.5

*Comparing visitor and resident knowledge about the role of TNNP using a 3 point scale where -1 = incorrect response and 1 = correct response (*t-Tests revealed significant differences between mean responses at $p < .05$).*

The roles indicated as the most important are presented in Table 4.5; 23% of visitors and 35% of residents indicated that the protection of habitat and the creatures that live there was the most important role of TNNP followed by the representation of a unique natural region of Canada. Visitors placed more importance on TNNP's role in the protection of boreal forest habitat, while residents indicated that cultural preservation was more important. This reflects the tie to the cultural history of the area as many residents in the local communities are linked to the families that once lived and work in the area now encompassed by the Park. Generally, the roles identified as most important accurately reflect the roles of TNNP within the system of national parks.

Table 4.5
Comparing the most important roles of TNNP as perceived by visitors and residents.

Visitors	**%**	**Communities**	**%**
1. Protect habitat and creatures	23	1. Protect habitat and creatures	35
2. Represent a natural area of Canada	18	2. Represent a natural area of Canada	16
3. Maintain boreal forest ecosystem	17	3. Enjoyment for Canadians	12
4. Enjoyment for Canadians	15	4. Protect ponds, lakes, and wetlands	7
5. Represent example of the boreal forest	11	5. Protect the cultural significance	7

Participants were then given a series of statements representing attitudes towards various park objectives and management issues. Visitors showed more positive attitudes and greater understanding of park management objectives, possibly indicating the influence of increased availability and subsequently participation in interpretation program. Figure 4.6 shows the percentage of respondents that indicated agree or strongly agree with the

series of statements, while Table 4.6 demonstrates the statistical differences between mean responses for visitors and residents.

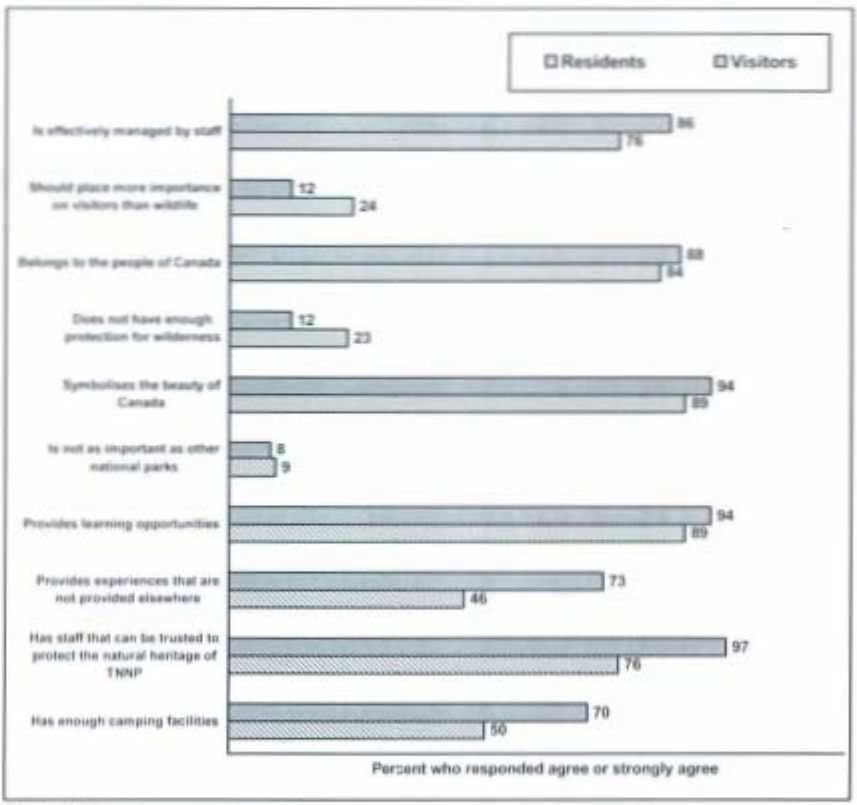

Figure 4.6
Comparing visitor and resident attitudes towards TNNP using a 5 point scale where 1 = strong disagreement and 5 = strong agreement.

Table 4.6
Independent samples t Tests comparing attitudes between visitors and residents toward TNNP, using a 5-point scale where 1 = strongly disagree and 5 = strongly agree.

Attitudinal indicator	Mean Score		*df*	*t*	Sig.
	Visitors	Residents			
Positive survey items					
TNNP has enough camping facilities	3.59	3.46	233	-1.11	.27
TNNP has staff that can be trusted to protect the natural heritage of TNNP	4.27	3.89	332	-5.28*	.00
TNNP provides experiences that are not provided elsewhere	3.91	3.36	325	-5.86*	.00
TNNP provides learning opportunities	4.22	4.01	290	-3.49*	.00
TNNP symbolises the natural beauty of Canada	4.34	4.11	332	-2.97*	.00
TNNP belongs to the people of Canada	4.33	4.14	329	-1.95	.05
TNNP is effectively managed by park staff	3.84	3.61	333	-2.41*	.02
TNNP does not have enough protection for wilderness	2.45	2.79	325	3.07*	.00
Negative survey items					
TNNP is not as important as other national parks	1.69	1.92	327	2.02*	.04
TNNP should place more importance on visitors than wildlife	2.31	2.69	324	3.23*	.00

* significant at $p < .05$

There was a significant difference between visitor and resident perceptions of the effectiveness of park management; 97% of visitors believe that park staff can be trusted to manage the natural heritage of TNNP as opposed to 76% of residents, $t(332) = -5.28$, $p < .05$. Similarly, 86% of visitors and 76% of residents indicated that TNNP is effectively managed by staff, significantly higher for visitors, $t(333) = -2.41$, $p < .05$. Most respondents believed that TNNP has enough wilderness protection and agree that TNNP is as important as other national parks, interestingly, residents were more likely to perceive a lack of wilderness protection, $t(325) = 3.07$, $p < .05$ and that TNNP is not as

important as other parks, $t(327) = 2.02$, $p < .05$. Generally, respondents did not agree that more importance should be given to visitors than wildlife but again compared to visitors, residents were more likely to place more importance on visitors than wildlife, $t(324) = 3.23$, $p < .05$, possibly reflecting the value of tourism and the associated economic benefits to local communities.

There was universal agreement that TNNP provides learning experiences, belongs to the people of Canada, and symbolises the beauty of Canada, with visitors scoring significantly higher on most positive attitudes. There were conflicting perceptions of camping facilities as 70% of visitors and only 50% of residents agreed that TNNP has enough camping facilities, although the difference between the groups was not significant at $t(233) = -1.11$, $p = .27$. This was also true regarding the provision of unique experiences; 73% of visitors and 46% of residents agreed that TNNP provides experiences that are not available elsewhere; the difference between mean scores was significant at $t(325) = -5.86$, $p < .05$.

Figure 4.7 illustrates the percentage of visitors and local residents that were able to correctly identify a series of general knowledge-based questions on TNNP as true or false. For example, the majority of visitors and residents understood that TNNP is not a provincial institution. However, both visitors and residents agreed that the boreal forest of TNNP is a healthy ecosystem; only 10% of visitors and 8% of residents identified this statement as false. In reality and largely as result of the impacts of introduced species,

TNNP's forest is ageing and will not persist without ensuring that natural process occur. Visitors and residents did recognise that the natural structure of the forest is dominated by black spruce and balsam fir vegetation. There appears to be a general misconception that the golf course is operated by TNNP. Residents are less aware that the golf course is a privately operated business than visitors. Finally, more visitors understand that TNNP is a part of a larger system than local community residents. Visitors demonstrated generally greater knowledge overall and statistically greater knowledge on three of the general knowledge indicators.

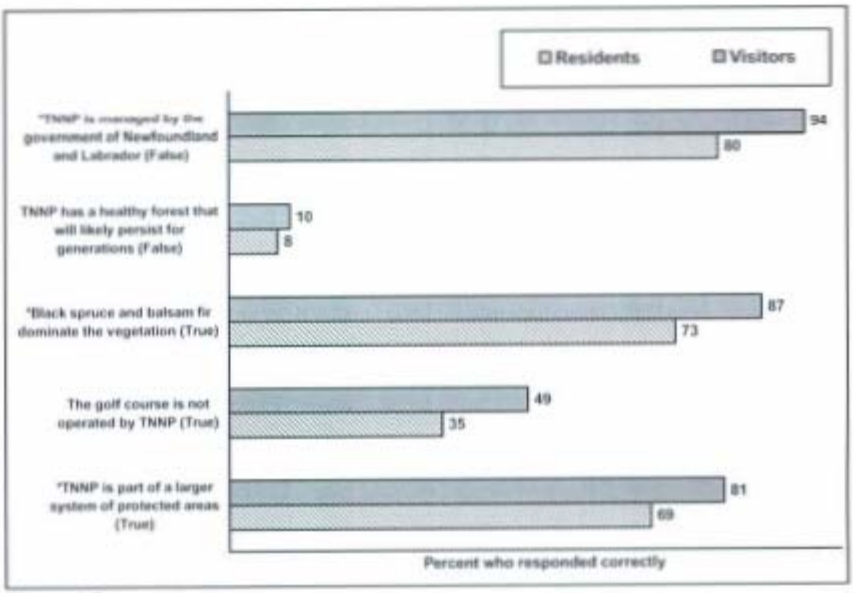

Figure 4.7

*Comparing general visitor and resident knowledge of TNNP using a 3 point scale where -1 = incorrect response and 1 = correct response (*t-Tests revealed significant differences between mean responses at $p < .05$).*

Visitors were selected based on having visited TNNP, while 97% of residents indicated that they have visited the park. The mean number of visits to TNNP was 3.8 visits for visitors and 5.3 visits for residents; the difference between the means is not significant ($t(302) = 1.147$, $p > .05$). The mean number of days spent in the park for each visit is 8.9 for visitors and 0.7 for residents. This difference is statistically significant at $t(294) = -5.320$, $p < .05$. Therefore, most visitors visit the park on average 3 to 4 times per year for 8 to 9 days each trip. Residents visit the park an average of 5 to 6 times during the year for an average stay of one day or less. On average, each visitor will spend a total of 33.8 days in the park in a year, while residents will spend on average 3.9 days in the park in a year.

Attendance at educational programs is extremely high among visitors, while participation in educational activities is much lower for community residents. Figure 4.8 shows the percentage of each sample that has attended various program types in Terra Nova National Park. For example, 97% of visitors have visited the Visitor Information Centre as compared to 72% of community residents. This trend continues across all programs with 96% of visitors having attended an evening theatre program, compared to only 44% of residents; 92% of visitors have attended a campfire compared to 24% of residents; 90% of visitors have completed a self-guided trail, compared to 45% of residents; 71% of visitors have attended a special events, compared to 34% of resident.

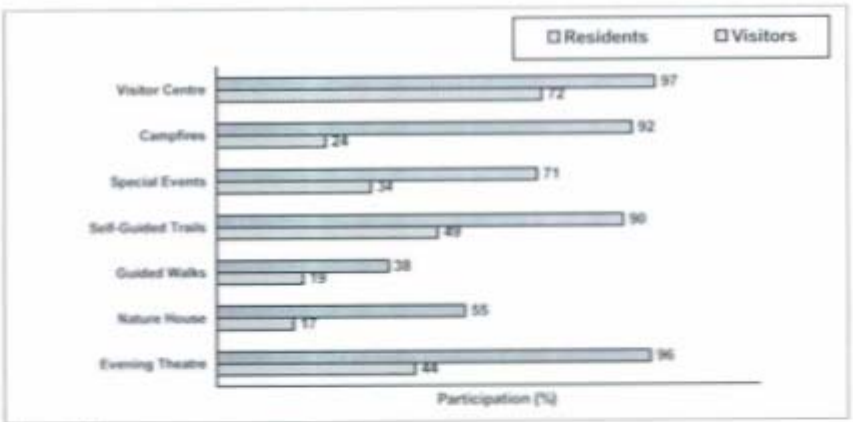

Figure 4.8
Percent participation in educational programming in Terra Nova National Park.

Visitors participated significantly more in each of the program types than residents with the exception of guided walks (Table 4.7). The residents who do avail of programming participate in most programs once or twice per year. Among visitors, there are certain programs that appear to be much more popular such as self-guided trails that each visitor completes 6 to 7 times per year. The average visitor also attends evening theatre programs and campfires 5 to 6 times a year. The most popular activity among residents is visiting the main information centre once or twice per year.

Table 4.7
Independent samples t Tests comparing visitor and resident scores on frequency of participation variables, measured in the number of times the respondent participated in the type of program over a typical summer season.

	Mean Score		*df*	*t*	Sig.
Value	**Visitors**	**Residents**			
Outdoor theatre	5.29	.90	128	-7.48*	.00
Nature house	3.94	.37	122	-3.67*	.00
Guided walks	1.76	.29	135	-1.91	.06
Self-guided hiking trails	6.76	1.26	117	-5.26*	.00
Special events	1.62	.68	173	-3.70*	.00
Campfire program	5.08	.45	111	-4.73*	.00
Visitor Centre	2.82	1.82	257	-3.311*	.00

* significant at $p < .05$

4.3 Understanding ecological issues in Terra Nova National Park

Ecological integrity (EI) as described in earlier chapters ensures that the structure, processes, and components characteristic of the natural ecosystem in question are intact; it is the guiding principle for the management of national parks. TNNP actively communicates information to both audiences regarding the importance of maintaining ecological integrity and also messages specific to a number of ecological issues such as introduced species and species at risk. Although visitors and residents indicated that maintaining EI is the most important role of TNNP, many respondents had not once heard of EI; 41% of visitors and 32% of residents had heard of the term EI.

Only 34 % of visitors attempted to define EI compared to 29% of residents, more likely as a result of the method and not necessarily reflecting poor comprehension of the concept. Of those visitors attempting to define EI, 52% captured its essence by referring

to the maintenance of natural or representative ecosystems or to a healthy ecosystem. Of the community residents who attempted to define EI, 50% reflected the true meaning of EI. This suggests that only 18% of visitors as compared to 14% of community residents have a good understanding of EI.

One of the key goals of this study was to determine if 80% of park audiences could identify one of the key threats to EI including the absence of fire, introduced species, species at risk, and habitat fragmentation due to highway infrastructure. Neither audience reached this target. Of the visitors who indicated that they had heard of EI, 24% correctly named one of the key threats to ecological integrity as outlined in the park's Ecological Integrity Statement, 32% of residents who had heard of EI correctly identified one of the key threats. This suggests that residents are better informed on the park's ecological issues than visitors and this may reflect current efforts to involve communities in park planning processes and ecosystem management.

Many respondents indicated general threats such as "humans" or "pollution." The threats most identified by visitors (those who had heard of EI) included: visitors or humans (32%), fire (28%), and introduced species (11%) (Figure 4.9). Only 4% of visitors identified the ageing forest and only 2% identified fire suppression as threats to EI in TNNP. Some of the visitors who indicated introduced species specifically indicated the impact of moose and squirrel introductions.

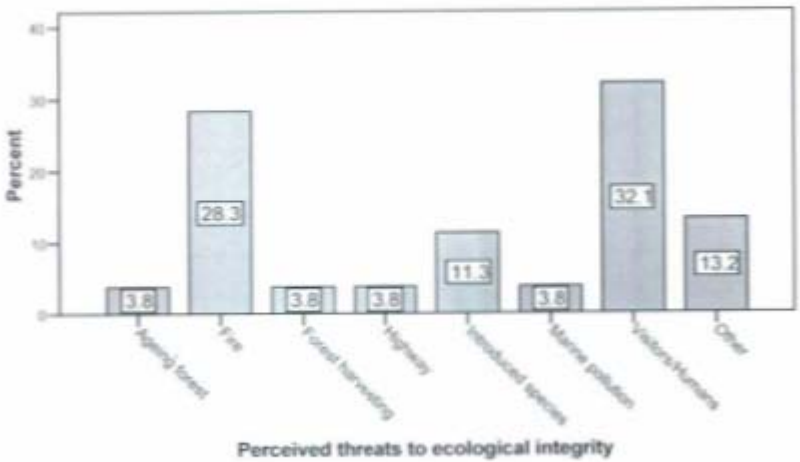

Figure 4.9
Visitor perceptions of threats to the ecology of TNNP.

The threats most frequently identified by residents (those who had heard of EI) included: fire (27%), visitors or humans (18%), and poaching 10%) (Figure 4.10). Only 2% of residents indicated that fire suppression as a threat, while 5% of residents indicated that prescribed burns are a threat to the ecosystem. It is important to note that the ecology of the park is complex and individuals may not fully understand the issues, however, park programming specifically addresses the key issues in both in-park and outreach educational programs, this suggests that they key issues are not being effectively communicated to their key publics.

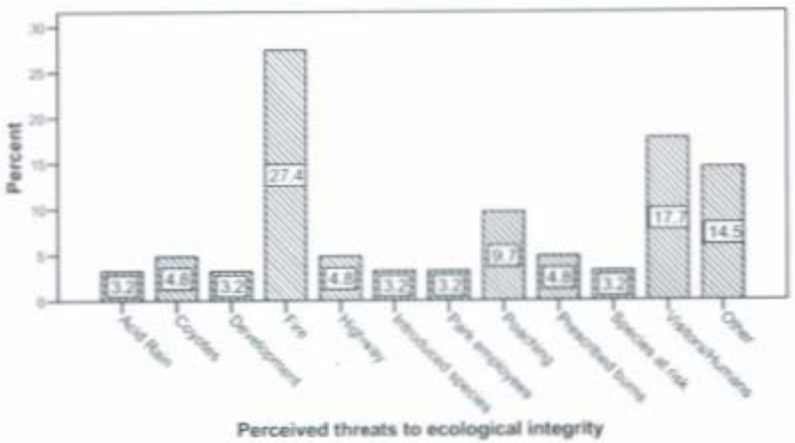

Figure 4.10
Resident perceptions of threats to the ecology of TNNP.

Generally, visitors and residents did not understand the meaning of ecological integrity. In particular, there were a couple areas that illustrate a lack of clarity (Figure 4.11). For example, more than half of visitors and residents identified that ecological integrity does not necessarily restore pre-human contact ecological conditions. The majority of visitors and residents identified that ecological integrity is not solely the responsibility of park management but that all park users must ensure that ecological integrity is maintained. There also appeared to be a lack of understanding regarding the role of natural processes in ensuring ecological integrity. Generally, residents seemed to demonstrate greater understanding of ecological issues than visitors, although there were no statistically significant differences between the means of the two groups.

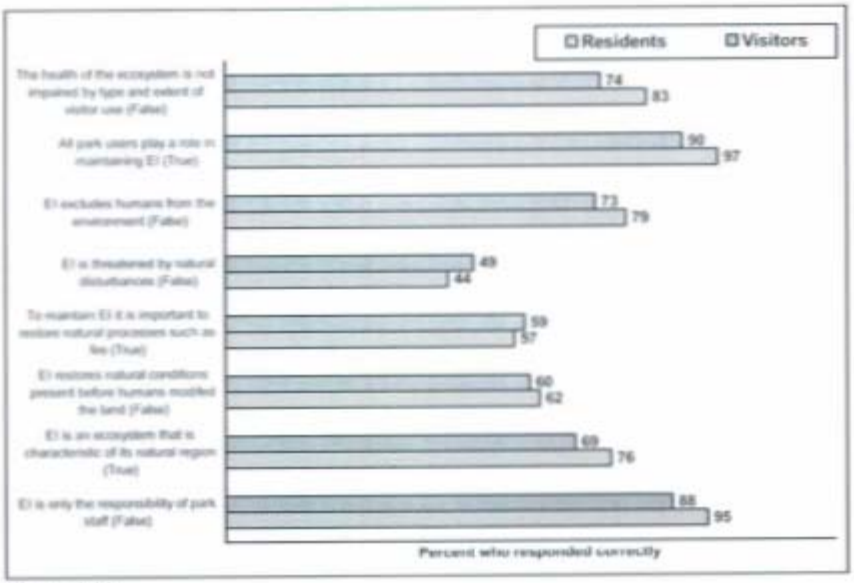

Figure 4.11
Comparing visitor and resident knowledge of ecological integrity using a 3 point scale where -1 = incorrect response and 1 = correct response.

Participants were asked to indicate their level of agreement with a series of statements regarding specific ecological issues in TNNP. Generally, visitors exhibited more positive attitudes towards ecological issues with the exception of issues directly affecting satisfaction of the campground experience (Figure 4.12). Table 4.8 demonstrates statistical differences between the group means for visitors and communities for these specific statements.

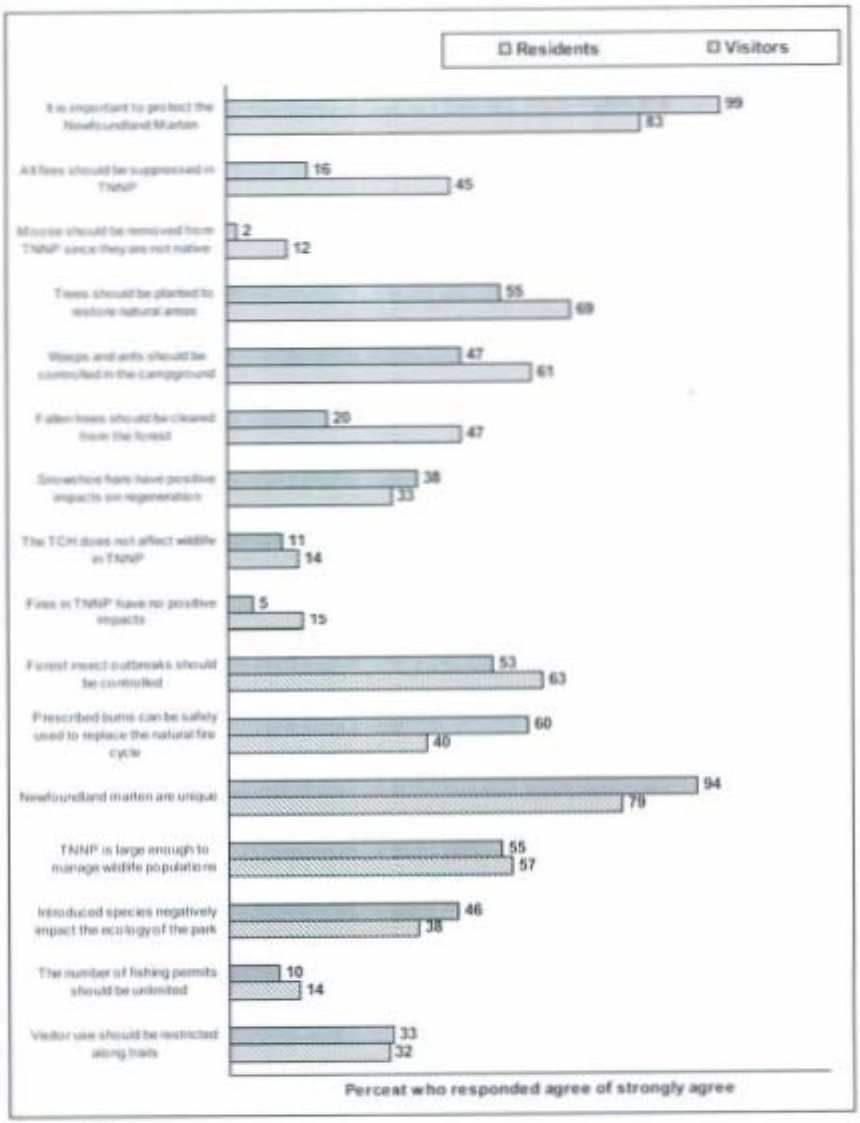

Figure 4.12

Comparing visitor and community resident attitudes towards ecological issues in TNNP using a 5 point scale where 1 = strong disagreement and 5 = strong agreement.

Table 4.8

Independent samples t Tests comparing attitudes between visitors and residents towards ecological issues, using a 5-point scale where 1 = strongly disagree and 5 = strongly agree.

	Mean Score				
Attitudinal indicator	**Visitors**	**Residents**	***df***	***t***	**Sig.**
Positive survey items					
Visitor use should be restricted along wilderness trails	2.75	2.81	330	.444	.65
Introduced species negatively impact the ecology of the park	3.37	3.20	328	-1.59	.11
Newfoundland marten are unique	4.43	4.01	335	-4.55*	.00
Prescribed burns can be safely used to replace the natural fire cycle	3.49	2.98	330	-4.02*	.00
Moose should be removed from the park since they are not native to the park ecosystem	1.74	2.04	335	2.83*	.00
It is important to protect the Newfoundland marten	4.69	4.10	281	-6.95*	.00
Negative survey items					
All fires should be suppressed in the park	2.30	3.26	321	7.66*	.00
Fallen trees and windfalls should be cleared from the forest	2.26	3.20	330	6.89*	.00
The number of fishing permits should be unlimited in the park	2.12	2.23	333	.97	.33
TNNP is large enough to manage wildlife populations	3.41	3.44	332	.29	.77
The trans-Canada highway does not affect wildlife in TNNP	2.03	2.17	336	1.32	.19
Fires in TNNP have no positive ecological impacts	2.08	2.36	325	2.75*	.01
Snowshoe hares have a positive impact on forest regeneration	3.31	3.21	327	-1.04	.30
Neutral survey items					
Trees should be planted in the park to restore natural forests	3.44	3.68	332	2.09*	.04
Forest insect outbreaks should be controlled	3.47	3.61	332	1.24	.21
Wasp and ants should be controlled in the campground	3.21	3.53	332	2.39*	.02

* significant at $p < .05$

Visitors and residents demonstrated positive attitudes toward and understanding of the Newfoundland marten; the majority of respondents agree that it is a unique species and should be protected. Visitors are statistically more positive about the Newfoundland marten on both items at $t(335) = -4.55$, $p < .05$, and $t(281) = -6.952.02$, $p < .05$, respectively. Both audiences also understood that the highway has a detrimental impact on wildlife in TNNP. There appeared to be a lot of uncertainty or neutrality on many other issues. While it appeared that both visitors understood that fire has a positive effect on forest ecology (communities scored statistically less), 45% of residents indicated that all fires should be suppressed in comparison to 16% of visitors, the difference between mean score on this item was significant at $t(321) = 7.66$, $p < .05$. In addition, 60% of visitors believed that prescribed burns may replace the natural fire cycle as opposed to 40% of residents, also significant at $t(330) = -4.02$, $p < .05$.

Other interesting findings include perception of fallen trees; 47% of residents thought that they should be removed in comparison to 20% of visitors, the differences in the means is significant at $t(330) = 6.89$, $p < .05$. Also, 55% of visitors and 70% of residents believed that trees should be planted to restore natural ecosystems. Although 46% of visitors and 37% agreed that introduced species negatively affect park ecosystems, 38% of visitors and 33% of residents indicated that snowshoe hares positively impact forest regeneration. Residents scored statistically higher on support removal of moose from the ecosystem than visitors at $t(335) = 2.83$, $p < .05$ but generally all respondents disagreed with this statement.

According to visitors, the most important ecological issues include species at risk, human impacts, ageing forest, landfills, and water pollution (Table 4.9). Community residents responded similarly, however residents indicated that tourism development was one of the top concerns and made no mention of landfills. The identification of water pollution reinforces the misperceptions that TNNP has a marine component.

Table 4.9
Comparing the most important ecological issues in TNNP as perceived by visitors and residents.

Visitors	**%**		**Residents**	**%**
1. Species at risk	31		1. Human impacts	24
2. Human impacts	22		2. Species at risk	22
3. Ageing forest	16		3. Ageing forest	19
4. Landfills near park	5		4. Water pollution	7
5. Water pollution	5		5. Tourism development	5

Chapter Four, *Understanding of park themes by park audience*, has presented descriptive results and comparison of means (*t*-tests) on individual variables that were addressed by the data collection instrument. These results documented that there were gaps in both visitor and resident knowledge with respect to the national park system and TNNP. Generally, visitor knowledge was significantly higher than residents. The analysis also determined that overall attitudes toward Canada's national parks and TNNP were positive with visitors exhibiting significantly more positive attitudes than residents, with a few exceptions as noted. A similar trend was documented for values of national parks and TNNP. These differences are further evidenced by significantly higher visitor participation in park interpretation programs. With respect to ecological integrity, both

audiences exhibited a poor understanding of the concept; responses between audiences did not show any significant difference. However, visitor attitudes were significantly more positive towards ecological concerns, again with a few noted exceptions.

These results have begun to identify gaps in knowledge or misconceptions that may be addressed by park educators and provide a baseline from which changes in attitudes, values, and knowledge levels can be measured in the future. In addition to this descriptive analysis, principal component analysis, binary logistic regression and a confirmatory discriminant function analysis were performed for each of the three research themes: The Parks Canada Agency, Terra Nova National Park, and ecological integrity. The following section, Chapter Five – *Toward a better understanding of visitor and resident perceptions*, presents the multivariate results for each of these analyses and themes.

5.0 Toward a Better Understanding of Visitor and Residents Perceptions

Chapter Five interprets the results from the multivariate statistical analyses described in Chapter Three, *Methodology*. Chapters four and five both strive to compare results obtained from visitors and residents. However, the use of multivariate statistics in Chapter five can add valuable insight to how the variables relate to each other and how visitors and residents are expected to respond to the variables. As in the previous chapter, the results are divided into three sections corresponding to the three main interpretation themes in TNNP as stated in Chapter One, *Introduction* – (1) to provide a measurement of visitor and community understanding with respect to the role of Parks Canada, (2) to document visitor and community understanding with respect to the role of Terra Nova National Park within the National Park System, and (3) to evaluate understanding of issues relating to ecological integrity. For each of these research themes, key results are presented from the principal component analysis, discriminant function analysis, and logistic regression.

The first research theme was the role of Parks Canada from a national perspective. For this first theme, 56 variables from the original data set were used as predictors of visitor and community understanding of the national park system. These predictors included participation data, knowledge of Canada's park system, and attitudes towards the Parks Canada Agency and mandate. The second research theme was the role of Terra Nova National Park (TNNP) (within the national park system) and understanding of local park issues. In this second theme, 49 variables from the original data set were used as

"predictors" of visitor and community understanding of TNNP. These predictors included items used to measure attitudes towards and knowledge of TNNP, as well as participation in park programs and general park values. The third research theme was discerning ecological priorities in Terra Nova National Park (TNNP). For this third theme, 61 variables were used as "predictors" of visitor and community understanding of ecological integrity in TNNP. The above mentioned variables included the eight participation-related variables that were used in each of the three separate analyses to determine if participation in park programs elicited an effect on attitudes, values, and understanding in relation to each of the three main interpretation themes. Similarly, they also include the 14 value-based variables that were used in each analysis to determine if there was a correlation between personal values and attitudes, knowledge, or participation as it relates to the three main interpretation themes.

Prior to the execution of the three multivariate analyses multivariate outliers were identified and removed using the Mahalanobis distance. Twenty-five cases were removed from theme one, using criterion, $p = .001$ with 56 df, critical $\chi^2 = 94.47$. These 25 cases were removed, yielding a sample size of 329 cases to be used in each of the 3 types of subsequent analyses for the purpose of evaluating understanding of Canada's national park system. Twenty-nine cases were removed from theme two using criterion, $p = .001$ with 49 df, and critical $\chi^2 = 85.35$. These 29 cases were removed yielding a sample size of 325 cases to be used in each subsequent analysis for the purpose of evaluating understanding of TNNP. Twenty-seven cases were removed from theme three

using criterion, p = .001 with 61 df, critical $\chi^2 = 102.15$. These 27 cases were removed yielding a sample size of 329 cases to be used in each subsequent analysis for the purpose of documenting visitor and community understanding of ecological issues in TNNP.

5.1 Principal component analyses

A principal component analysis (PCA) was used to reduce the number of variables in each section into a smaller set of "super variables" or "components." These new components were used as dependent variables in the subsequent discriminant function analysis and binary logistic regression. The cut off was set at .32 (loadings less than .32 were removed) for inclusion of a variable in the analysis as outlined by Tabachnick and Fidell (2007).

There were 56 variables measuring national park understanding used in the First PCA, 49 in the second PCA measuring understanding of TNNP and 61 variables in the third PCA measuring understanding of ecological integrity. There were 329 cases used in the first PCA; only three of the 56 variables did not load on any component and were removed from the subsequent two analyses (Binary Logistic Regression and Discriminant Function Analysis). There were 325 cases used in the second; only three of the 49 variables did not load on any component and were removed from the subsequent two analyses. There were 327 used in the third PCA; only eight of the 56 variables did not load on any component and were removed from further analyses.

For each of the three separate PCAs, most of the values in the anti-image correlation matrix (not shown) were sufficiently small to indicate a reliable PCA. Kaiser's measure of sampling accuracy was .75 for the first theme, .71 for the second and .78 for the third, also indicative of a relaible PCA. Evaluation of all other limitations of the PCA outlined in Chapter Three, *Methodology*, revealed no concerns.

5.1.1 PCA - Understanding Canada's national park system

Principal components extraction with varimax rotation was performed through SPSS FACTOR on 56 items from the Parks Canada section of the research instrument included data on participation in park programs (n = 329). Varimax rotation is a variance maximizing procedure to make high loadings higher and low loading lower to help highlight variance (Tabachnick & Fidell, 2007). Six components were extracted by examining a scree plot (not shown). Eigenvalues for the first six components were all greater than 1.97. These six components represented 38% of the variance with extraction of eigenvalues greater than one and following rotation.

In the Rotated Component Matrix, (Table 5.1), the 56 variables (indicated by their measurement definitions used in the data collection instrument) are ordered and grouped by magnitude of loading to facilitate understanding. For example, component one has been given the label – *positive values*; it is comprised of thirteen variables from the original data set each representing an appropriate value of national parks or reason to have National Parks for Canadians. Loadings are only shown for the component in

which each variable is interpretable. for example in component one the first variable is "a place to protect nature and living things." Only the loadings for component one are presented. Educational values (a place to learn about environmental processes) load the highest at .72, while recreational values (a place to enjoy outdoor recreation activities) load the lowest, at .43. This indicates that educational values account for the greatest variance among answers within this component. Cultural values and historical values both load at .60 suggesting that they interact in a similar manner. Also, nine of the twelve predictors have loadings with magnitudes in excess of .60, indicating a high level of overlapping variance. The last row of the table summarises the total variance explained by each component, for example component one accounts for 9.63% of the total variance in the model.

Table 5.1
Understanding Canada's national parks: Rotated Component Matrix with Varimax Rotation and Kaiser Normalisation (Theme 1).

	Component					
Variables	1	2	3	4	5	6
COMPONENT ONE: POSITIVE VALUES						
A place to learn about environmental processes	.72					
A place to go where civilization does not interrupt	.70					
A place to reflect on personal experiences	.70					
A place to express our moral/ethical obligation to respect and protect other living things	.68					
A place to protect nature and living things	.67					
A place to conduct scientific research on the natural environment	.64					
A place to enjoy the beauty of nature	.61					
A place to show us a people's culture	.60					
A place to honour and remember historical events	.60					
A place to maintain or regain one's physical health	.59					
A place to get closer to spiritual matters	.53					
A place to enjoy outdoor recreation activities	.43					

COMPONENT TWO: POSITIVE ATTITUDES					
National parks are fun places for adults to enjoy	.74				
National parks are fun places for children	.70				
National parks symbolize the beauty of Canada	.67				
Parks Canada is a responsible guardian of Canada's natural heritage	.67				
National parks provide opportunities to learn about natural history	.63				
Parks Canada can be trusted to protect our natural areas	.59				
Protection of natural areas requires the co-operation of all Canadians	.43				
National parks provide unique experiences not available elsewhere	.41				
Wilderness preservation is a worthwhile goal	.41				
COMPONENT THREE: PARTICIPATION					
Participation in outdoor theatre programs		.81			
Participation in campfire programs		.76			
Participation in nature house activities		.66			
Use of self-guided hiking trails		.60			
Visitor centre visitation		.59			
Participation in special events		.52			
Participation in guided hikes		.47			
Days spent in TNNP per trip		.39			
COMPONENT FOUR: UTILITARIAN ETHICS					
A source of resources for society to use in the future			-.65		
National parks protect natural resources such as timber or minerals for future development			.61		
National parks ensure that camping facilities meet the needs of Canadians			.55		
National parks belong to the people of Canada			.47		
National parks create employment opportunities for local communities			.46		
National parks ensure the protection of our cultural heritage			-.43		
A place to enhance the economy through development			-.41		
The national park system is incomplete			.40		
COMPONENT FIVE: ANTHROPOCENTRISM					
Communities should be more involved in park planning				.57	
Visitor services should be a higher priority than protecting the natural environment				.55	
Visitors should be more involved in park planning				.53	
People are more important than wildlife in national parks				.48	
Provinces should be allowed to use resources within a national park				.46	
People should be able to use parks without restrictions				.45	
COMPONENT SIX: SYSTEM KNOWLEDGE					
The Parks Canada Agency is also responsible for the					.56

management of National Historic Sites						
National parks protect and present nationally significant examples of Canada's natural heritage						.50
National parks represent the natural heritage of each province and territory of Canada						-.50
National Parks are managed by the respective provincial governments						.47
National parks protect natural processes and components of Canada's natural regions						.43
National parks represent the 39 natural regions of Canada						.40
There is at least one national park covering each natural region in Canada						-.39
National parks provide opportunities to learn about the natural world						.36
National parks foster public understanding, appreciation, and enjoyment						.32
% of variance	**9.63**	**7.35**	**6.62**	**5.24**	**5.08**	**4.13**

The second component, labelled *positive attitudes*, is comprised of nine of the original 56 variables in the model. This component appears to be characterized by positive attitudes towards the Parks Canada Agency and the National Park mandate. Component two explains 7% of the total variance in the model. The attitude that national parks are places that adults enjoy loads the highest at .74 followed by the attitude that national parks are fun places for children with a loading of .70. The last two variables, national parks provide unique experiences not available elsewhere and wilderness preservation is a worthwhile goal both load at .41 suggesting that they also interact similarly.

The third component is labelled *participation* and explains 7% of the total variance. This component includes eight variables related to interpretative activities in Terra Nova National Park and is characterized by trends in participation in educational programming

and visitation to Terra Nova National Park. Participation in outdoor theatre and campfire programs load the highest at .81 and .76, respectively.

The fourth component is the most difficult to interpret due to conflicting results. The fourth component has been labelled *utilitarian ethics* and for the most part, describes economic and resource-based attitudes and values towards the national park system. It is also comprised of eight variables from the original data set related to utilitarian concepts. The first variable, representing a resource value of parks, load negatively at -.65, while the second variable representing the role of national parks in protecting resources for future development loads positively at .61. This seems to be a conflict of perception. Parks are not primarily perceived in terms of a resource value but the inclusion of the word protect has a positive connotation that may lead the respondent to agree to a statement that includes "National parks protect natural resources..." with respect to being a role of Parks Canada. Both resource (a source of resources for society to use in the future) and economic values (a place to enhance the economy through development) contributed negatively to the component, while utilitarian perceptions of the role of national parks contributed positively. This demonstrates a sense of ownership over national parks in that they provide a service to Canadians but also reinforces a lack of clarity as to the primary roles of national parks. Resource values and economic value, however, are not values most attributed to the national park system.

The fifth component, labelled *anthropocentrism*, includes six of the 56 original variables that emphasise the human uses of national parks. This component describes 5% of the total variance in the model and is characterized by demands for increased public involvement, anthropocentric attitudes towards national parks, and utilitarian ethics. The attitude that communities should be more involved in planning loads the highest at .57 and the belief that people should be able to use the park without restriction loads lowest at .45.

The sixth component is labelled *system knowledge* and is comprised of nine items from the original instrument that relate understanding of the national park system and the Parks Canada mandate. This last component explains 4% of the total variance in the model. Knowledge that the Parks Canada Agency is responsible for National Historic Sites loads highest at .56 and knowledge that Parks Canada is mandated to foster public understanding, appreciation, enjoyment loads lowest at .32.

5.1.2 PCA - Local perspectives in Terra Nova National Park

Principal components extraction with varimax rotation was performed through SPSS FACTOR on 49 items from the Terra Nova National Park section of the survey instrument including value items from the Parks Canada section (n = 325). Six factors were extracted by examining the loadings and scree plot (not shown). Eigenvalues for the first 6 components are all greater than 1.72; subsequent changes in successive

eigenvalues were much smaller. These six components represented 40% of the variance with eigenvalues greater than one and following rotation.

In the Rotated Component Matrix, (Table 5.2), the 49 variables (indicated by their measurement definitions used in the data collection instrument) are ordered and grouped by magnitude of loading to facilitate understanding. Interpretative labels are suggested for each factor. Component one has been attributed the label – *positive values*, and shows similar characteristics to the like-named component from the previous model; characterized by positive values of nature and the national parks system. This component is comprised of eight variables from the original data set each representing an appropriate value of national parks, that is, values that are promoted through the Parks Canada Mandate. Component one, *positive values*, represents 8% of the variance in the data set with ecological values (a place to protect nature and living things) loading the highest at .80; educational values (a place to learn about environmental processes) and aesthetic values (a place to enjoy the beauty of nature) also load high at .79 and .75 respectively. Recreational values (a place to enjoy outdoor recreation activities) load the lowest at .43. Also, 5 of the 8 variables load values in excess of .60.

Table 5.2
Local Perspectives in TNNP: Rotated Component Matrix with Varimax Rotation and Kaiser Normalization (Theme 2).

	Component					
Variables	1	2	3	4	5	6
COMPONENT ONE: POSITIVE VALUES						
A place to protect nature and living things	.80					
A place to learn about environmental processes	.79					

A place to enjoy the beauty of nature	.75			
A place to express our moral/ethical obligation to respect and protect other living things	.70			
A place to conduct scientific research on the natural environment	.68			
A place to shows us a people's culture	.52			
A place to honour and remember historical events	.51			
A place to enjoy outdoor recreation activities	.43			
COMPONENT TWO: PARTICIPATION				
Participation in outdoor theatre programs		.82		
Participation in campfire programs		.76		
Participation in nature house activities		.70		
Participation in guided hikes		.66		
Visitor centre visitation		.66		
Participation in special events		.55		
Use of self-guided hiking trails		.52		
Days spent in TNNP per trip		.36		
COMPONENT THREE: FALSE PERCEPTIONS				
TNNP develops the economies of local communities			.68	
TNNP protects timber resources for future development			.66	
TNNP protects the fisheries in Bonavista Bay			.65	
A source of resources for society to use in the future			-.64	
TNNP protects the long range mountains rising abruptly from coastal plains			.58	
TNNP provides visitors with first-class golfing facilities			.54	
TNNP protects Canada's rare tundra vegetation			.54	
A place to enhance the economy through development			-.54	
TNNP protects the cultural history of the area			-.42	
COMPONENT FOUR: POSITIVE ATTITUDES				
TNNP provides learning opportunities				.66
TNNP has staff that can be trusted to protect the heritage of TNNP				.64
TNNP is effectively managed by park staff				.60
TNNP symbolizes the beauty of Canada				.55
TNNP provides experiences that are not provided elsewhere				.52
TNNP belongs to the people of Canada				.43
TNNP is not as important as other national parks				-.43
TNNP has enough camping facilities				.39
TNNP should place more importance on visitors than wildlife				-.33
COMPONENT ONE: PERSONAL VALUES				
A place to reflect on personal experiences				.77
A place to go where civilization does not interrupt				.71
A place to maintain or regain one's physical health				.67

A place to get closer to spiritual matters					.60	
COMPONENT SIX: PARK KNOWLEDGE						
TNNP protects ponds, lakes, bogs, and wetlands						.64
TNNP provides learning experiences for its visitors						.60
TNNP represents a unique natural region of Canada						.56
TNNP maintains and restores the boreal forest ecosystem						.54
TNNP protects a representative example of the boreal forest						.48
TNNP provides enjoyment for all Canadians						.46
TNNP protects habitat and the living creatures that live there						.45
TNNP protects the shelter ocean environment						-.40
% of variance explained	**8.43**	**7.60**	**7.55**	**5.74**	**5.70**	**5.03**

The second component, labelled *participation*, includes eight of the original 49 variables in the model related to trends in participation and visitation to TNNP. This component explains 8% of total variance in the model. Participation in outdoor theatre and campfire programs load the highest at .82 and .76, respectively, and therefore account for most of the variance in this component.

The third component is labelled *false perceptions* and explains 8% of the total variance in this second model. This component is comprised of nine variables, most of which represent false statements about TNNP that were perceived by the respondents as truthful statements, therefore this component represents gaps in knowledge and attitudes towards TNNP. For example, the variable "TNNP develops the economies of local communities loaded the highest at .68 followed by "TNNP protects timber resources for future development at .66. Both statements do not reflect primary roles of TNNP yet are perceived to be a role of the Park. The variable "TNNP protects the cultural history of

the area loaded negatively at -.42 suggesting that this is not a perceived role of TNNP. Resource values (a source of resources for society to use in the future) and economic values (a place to enhance the economy through development) contributed negatively to this component at -.64 and -.54, respectively, suggesting that respondents who demonstrate poor understanding of park roles do not believe that economic and resource values are shared by Canadians with respect to TNNP.

The fourth component, *positive attitudes*, explains 6% of the variance and is made up of nine of the original variables in the model. Attitudes that TNNP provides learning opportunities and has staff that can be trusted load the highest on this component with scores of .66 and .64, respectively. The component is defined by positives attitudes towards TNNP.

The fifth component, given the label *personal values*, is comprised of just four variables and describes 6% of the total variance in the model. These four value-based variables focus on introspective and individual benefits of national parks: spiritual (a place to get closer to spiritual matters), intellectual (a place to go where civilization does not interrupt), solitudinal (a place to reflect on personal experiences), and therapeutic (a place to maintain or regain one's physical health) values, with solitudinal values loading the highest score of .77.

The sixth and last component is *park knowledge*. This component explains 5% of the variance and is comprised of eight variables representing perceived roles of TNNP. This component represents a good understanding of the roles and mandate of TNNP since seven of the variables that represent the true essence of the Park loaded positively with scores ranging from .64 to .45, while a common misconception about the Park, that TNNP protects an Ocean Environment, loaded negatively at -.44 suggesting that this doesn't represent as great of a knowledge gap as thought by park staff.

5.1.3 PCA - Discerning ecological priorities in Terra Nova National Park

Principal components extraction with varimax rotation was performed through SPSS FACTOR on 61 items from the Ecological Integrity section of the questionnaire and included participation items from the TNNP section and value items from the PC section (n = 327). Seven components were extracted by examining a scree plot and eigenvalues. Eigenvalues for the first seven components were all greater than 1.77; subsequent changes in successive eigenvalues were much smaller. These seven components represented 41% of the variance with extraction of eigenvalues greater than one and following rotation.

In the Rotated Component Matrix, (Table 5.3), the 61 variables (indicated by their measurement definitions used in the data collection instrument) are ordered and grouped by magnitude of loading to facilitate understanding. For example, component one has been given the label – *ecological issues*; it is comprised of 11 variables from the original

data set each representing the perceived importance of an ecological issue in TNNP. The importance of hunting to ecological integrity in TNNP loads the highest at .78, while the following four variables representing various resource use issues all load positively at .76, suggesting they interact similarly. The importance of air pollution loads the lowest, at .50. Also, nine of the 11 items have loadings with magnitudes in excess of .60, indicating a high level of overlapping variance. Component one accounts for 10% of the total variance in the model.

Table 5.3
Discerning Ecological Priorities in TNNP: Rotated Component Matrix with Varimax Rotation and Kaiser Normalization (Theme 3).

	Component						
Variables	1	2	3	4	5	6	7
COMPONENT ONE: ECOLOGICAL ISSUES							
The importance of hunting to EI in TNNP	.78						
The importance of mining activities to EI in TNNP	.76						
The importance of landfills near park to EI in TNNP	.76						
The importance of forestry activities to EI in TNNP	.76						
The importance of habitat fragmentation to EI in TNNP	.76						
The importance of human impacts to EI in TNNP	.75						
The importance of water pollution to EI in TNNP	.70						
The importance of sport fishing to EI in TNNP	.70						
The importance of introduced species to EI in TNNP	.62						
The importance of acid rain to EI in TNNP	.59						
The importance of air pollution to EI in TNNP	.50						
COMPONENT TWO: POSITIVE VALUES							
A place to learn about environmental processes		.79					
A place to protect nature and living things		.78					
A place to enjoy the beauty of nature		.75					
A place to conduct scientific research on the natural environment		.71					
A place to express our moral/ethical obligation to respect and protect other living things		.69					
A place to honour and remember historical events		.58					

A place to show us a people's culture	.54				
A place to enjoy outdoor recreation activities	.37				
COMPONENT THREE: PARTICIPATION					
Participation in outdoor theatre programs		.81			
Participation in campfire programs		.76			
Participation in nature house activities		.69			
Participation in special events		.60			
Visitor centre visitation		.58			
Participation in guided hikes		.53			
Use of self-guided hiking trails		.52			
Days spent in TNNP per trip		.41			
COMPONENT FOUR: ANTHROPOCENTRISM					
Trees should be planted in the park to restore natural forests			.69		
Wasps and ants should be controlled in the campground			.69		
Forest insect outbreaks should be controlled			.66		
Fallen trees and windfalls should be cleared from the forest			.64		
A source of resources for society to use in the future			.43		
A place to enhance the economy through development			.41		
TNNP is large enough to manage wildlife populations			.41		
The importance of tourism development adjacent EI in TNNP			.38		
COMPONENT FIVE: POSITIVE ATTITUDES					
It is important to protect the Newfoundland Marten				.78	
Newfoundland Marten and Unique				.72	
The Importance of survival of endangered species to EI in TNNP				.53	
Prescribed burns can be safely used to replace the natural fire cycle				.40	
Fire in TNNP have NO positive impacts				-.38	
Introduced species negatively impact the ecology of the park				.35	
COMPONENT SIX: PERSONAL VALUES					
A place to reflect on personal experiences					.71
A place to go where civilization does not interrupt					.67
A place to maintain or regain one's physical health					.57
A place to get closer to spiritual matters					.41
Age					-.35
COMPONENT SEVEN:POOR EI KNOWLEDGE					
All park users play an important role in maintaining the ecological integrity of national					.72

parks							
Ecological integrity excludes humans from the environment							.68
Ecological integrity is only the responsibility of park staff							.59
The health of the ecosystem is not impaired by type and extent of visitor use							.54
% of variance explained	**9.81**	**7.94**	**6.02**	**5.50**	**4.10**	**4.01**	**3.95**

The second component, labelled *positive values*, is comprised of eight of the original 56 variables in the model and is characterized by positive values of national parks. Component two explains 8% of the total variance in the model with educational values (a place to learn about environmental processes) and ecological values (a place to protect nature and living things) load the highest at .79 and .78, respectively.

The third component is labelled *participation* and explains 6% of the total variance. Similar to the previous models, this component includes nine variables related to interpretative activities in Terra Nova National Park and is characterized by trends in participation in educational programming and visitation to Terra Nova National Park. Participation in outdoor theatre and campfire programs load the highest at .81 and .76, respectively, as they did for the previous theme.

The fourth component has been labelled *anthropocentrism*, includes eight of the 56 original variables that emphasis the human uses of national parks. This component describes 5% of the total variance in the model and is depicted by anthropocentric attitudes towards ecological issues and characterised marked by humans demands for and

attitudes toward benefits that may be derived from national parks including economic and resource benefits and human comfort, such as the control of wasps and ants in the campgrounds and the importance of national parks to economic development including tourism. The highest loading variables, both positive at .69 include the planting of trees in the park and the control of wasps and ants in the campground, suggesting they interact similarly in the matrix.

The fifth component, labelled *positive attitudes*, is comprised of six of the original variables and accounts for 4% of the total variance in this model. This component is characterised by a good understanding of and attitudes towards two of the most important ecological issues in TNNP, the survival of endangered species and the ageing forest due to the suppression of the natural fire cycle. Both Newfoundland Marten items scored the highest with loadings of .78 and .72.

The sixth component is labelled *personal values* and includes just five variables and describes 4% of the total variance in the model. Four of the variables are value-based items that focus on introspective and individual benefits of national parks: spiritual (A place to get closer to spiritual matters), intellectual (A place to go where civilization does not interrupt), solitudinal (A place to reflect on personal experiences), and therapeutic (A place to maintain or regain one's physical health) values. The fifth item is age which loads negatively at -.35 suggesting that these more personal values of national parks are

more typical of younger park audiences. Solitudinal values load the highest with a score of .71.

The seventh and last component, labelled *poor EI knowledge*, explains 4% of the total variance and is comprised of four variables from the original instrument. This component is characterised by poor understanding of what is meant by ecological integrity. The highest loading variable at .72 states that all park users have a role in ensuring ecological integrity, however, the next 3 variables indicate belief that EI excludes humans from the ecosystem (.68), only Parks Canada is responsible for protection ecological integrity (.59), and that the health of the ecosystem is not impaired by visitor use (.54).

5.2 Binary logistic regression

A direct logistic regression analysis was performed using the two park audiences as outcomes and the components extracted during the principal component analysis as predictors for each of the three park interpretation themes – Canada's national parks, Terra Nova National Park, and ecological integrity. The primary purpose of selecting the logistic regression was to evaluate the classification of cases based on two categories: repeat visitors and community residents and to understand the dimensions along which the two sample populations differed and to evaluate how well the classification procedure described the research populations with respect to each of the three interpretation themes

in Terra Nova National Park. The binary logistic regression computes Wald statistics and odds ratios to interpret the effect size of the individual predictors.

The sample for theme one consisted of 329 cases that were divided into 188 residents (coded 0) and 141 visitors (coded 1). For theme two, the sample consisted of 325 cases, comprised of 189 residents (coded 0) and 136 visitors (coded 1). The sample for theme three consisted of 327 cases, comprised of 188 residents (coded 0) and 139 visitors (coded 1).

A omnibus goodness of fit test of the first theme was statistically significant χ^2 (6, 329) = 204.64, $p < .001$, indicating that the predictors used for theme one, as a set, reliably distinguished between visitors and residents. The omnibus goodness of fit test for themes two and three were also statistically significant at $\chi^2(6, 325) = 150.64$, $p < .001$ and $\chi^2(7, 327) = 176.29$, $p < .001$ respectively, indicating that all predictors reliably distinguished between visitors and communities. Predictors (components) for each theme were presented in Table 5.1, 5.2, and 5.3, respectively.

The Cox and Snell R squared value was computed to measure effect size for the model, taking into account sample size. For theme one $R^2 = .46$. A derivation of this measure, the Nagelkerke R squared value was also measured ($R^2 = .62$). The Cox and Snell R squared value for theme two, $R^2 = .32$ with a Nagelkerke R squared value of $R^2 = .50$ and for theme three the value was $R^2 = .42$ with a Nagelkerke R squared value of $R^2 = .56$.

The Hosmer-Lemeshow statistic also was used to formally evaluate goodness of fit by evaluating deciles of risk; a good model will produce a non-significant chi-square value. In the case of theme one the test was non-significant at χ^2 (8) = 8.83, p > .001. The test was also non-significant for theme 2 and 3 at χ^2 (8) = 10.09, p > .001 and χ^2 (8) = 7.68, p > .001 respectively.

5.2.1 BLR - Understanding Canada's National Park System

Classification based on the first interpretation theme, understanding of Canada's national parks and based on equal prior probabilities, is presented in Table 5.4. Classification revealed that 87% of residents and 79% of visitors were correctly classified, while overall, 84% of cases were correctly classified. Classification revealed that 25 residents were predicted to belong to the visitor group while 29 visitors were predicted to belong to the residents.

Table 5.4
Classification of respondents based on two outcome groups: visitor and residents using Logistic Regression (Theme 1). (a)

		Predicted Group Membership		Percentage Correct
	Observed	Resident	Visitor	
Step 1	Resident	163	25	87
	Visitor	29	112	79
	Overall Percentage			84

a The cut value was .500

Table 5.5 presents regression coefficients (β), Wald statistics (Wald), significance of the Wald criterion (sig.), and odds ratios (exp β), using 95 % confidence intervals for odds ratios for each of the six predictors. According to the Wald criterion, all predictors with the exception of utilitarian ethics reliably predict the group ($p < .05$). For example, the odds ratio (exp β) indicates that if, for a given case, the score on positive attitudes increases by one, the respondent is 3.26 times more likely to be a visitor. Should participation increase by one unit, the respondent is 15.63 times more likely to be a visitor. Additionally, an increase in one unit of system knowledge, suggests that the respondent is nearly twice as likely to be a visitor. A one unit increase in the scores for either positive values of national parks or anthropocentrism, means that the respondent is 1.5 times more likely to be a resident.

Table 5.5
Logistic regression analysis of understending of theme one - Canada's national park system as a function of value, knowledge, and attitudinal variables: visitors vs. residents.

Predictor	β	Wald Chi-square	df	Sig.	Odds Ratio Exp(β)
Positive values	-.42	6.55	1	.01	.66
Positive attitudes	1.18	35.60	1	.00	3.26
Participation	2.75	67.20	1	.00	15.63
Utilitarian Ethics	.20	1.48	1	.22	1.22
Anthropocentrism	-.41	6.72	1	.01	.66
System knowledge	.69	13.76	1	.00	1.98
Constant	-.28	3.00	1	.08	.75

The correlation matrix suggests relationships between predictors (Table 5.6). The strongest relationship between predictors is the positive correlation between frequency of participation and positive attitudes with a score of .47. This suggests that respondents

with more frequent participation in park programs are also more likely to exhibit more positive attitudes toward Canada's national parks. Interestingly, there is also a negative correlation of -.25 between positive values and positive attitudes. This suggests that respondents with positive attitudes towards national parks do not necessarily espouse positive values of national parks. There is a negative correlation of -.20 between anthropocentrism and both positive attitudes and positive values suggesting that respondents that support human-oriented use are less likely to display positive attitudes and positive values with respect to national parks.

Table 5.6
Correlation Matrix between predictors of understanding the national park system.

	Constant	Positive values	Positive attitudes	Partici-pation	Utilitarian ethics	Anthro-pocentrism	Know-ledge
Constant	1.00	.11	-.07	.06	.01	.10	-.136
Positive values	.11	1.00	-.25	-.15	-.01	.20	-.08
Positive attitudes	-.07	-.25	1.00	.47	.06	-.20	.23
Participation	.06	-.15	.47	1.00	.18	-.20	.21
Utilitarian ethics	.01	-.01	.06	.18	1.00	-.01	.02
Anthro-pocentrism	.10	.20	-.20	-.20	-.01	1.00	-.10
System knowledge	-.13	-.08	.23	.21	.02	-.10	1.00

5.2.2 BLR - Local perspectives in Terra Nova National Park

Classification for the second interpretation theme, understanding of TNNP, is presented in Table 5.7. Binary logistic regression revealed that 85% of residents and 71% of visitors were correctly classified. Similar to previous classifications, 28 residents behaved as

visitors, while 40 visitors demonstrated responses typical of residents. Overall 79% of cases were correctly classified.

Table 5.7
Classification of respondents based on two outcome groups: visitor and resident using Logistic Regression (Theme 2). (a)

		Predicted Group Membership		Percentage
	Observed	Resident	Visitor	**Correct**
Step 1	Resident	161	28	85
	Visitor	40	96	71
	Overall Percentage			79

a The cut value is .500

Table 5.8 presents regression coefficients (β) and standard error (S.E.), Wald statistics (Wald), significance of the Wald criterion (sig.), and odds ratios (exp β) using 95 % confidence intervals for odds ratios for each of the six predictors. According to the Wald criterion, the two value based predictors, positive values and personal values, did not yield significant differences between the means at $p < .05$ and therefore do not reliably predict the group. The other four predictors: participation, false perceptions, positive attitudes, and knowledge reliably predict the group. For example, participation yields a beta value of 1.86 with a significance level <.05. Furthermore, the odds ratios (exp β) indicates that if participation increases by one unit, the respondent is 6.43 times more likely to be a visitor. Likewise, if the score on false perceptions increases by a score of one, the respondent is twice as likely to be a visitor. A one-unit increase on positive attitude scores, results in the respondent being 2.56 times as likely to be a visitor. If

scores increase by one unit for knowledge, the respondent is 1.74 times more likely to be a visitor.

Table 5.8
Logistic regression analysis of understanding local issues in TNNP as a function of value, knowledge, and attitudinal variables: visitors vs. residents.

Predictor	β	Wald Chi-square	df	Sig.	Odds ratio Exp(β)
Positive values	.01	.00	1	.94	1.01
Participation	1.86	56.95	1	.00	6.43
False perceptions	.73	21.91	1	.00	2.07
Positive attitudes	.94	31.45	1	.00	2.56
Personal values	.03	.05	1	.83	1.03
Knowledge	.55	8.34	1	.00	1.74
Constant	-.33	5.23	1	.02	.72

The correlation matrix below (Table 5.9) indicates the relationship between predictors. The strongest relationship among predictors is the positive correlation between participation and positive attitudes with a score of .36. This indicates that as participation in park programs increases, positive attitudes scores also increase, and *vice versa*. Participation is also (weakly) positively correlated with false perceptions with a score of .31, suggesting that as participation in TNNP's programming may be misleading in the delivery of some park messages or not effective in correcting misinformed audiences. However, participation also shows a slight positive correlation to knowledge with a loading of .21 suggesting that participation has a positive influence on knowledge and inversely that higher knowledge scores improve participation levels in park programs.

Table 5.9
Correlation Matrix between predictors of understanding local issues in TNNP.

	Constant	Positive values	Partici-pation	False perceptions	Positive attitudes	Personal values	Knowledge
Constant	1.00	.05	.05	-.02	-.02	-.02	-.08
Positive values	.05	1.00	.04	.01	.00	-.04	.02
Participation	.05	.04	1.00	.31	.36	-.02	.21
False perceptions	-.02	.01	.31	1.00	.14	-.04	.11
Positive attitudes	-.02	.00	.36	.14	1.00	.01	.15
Personal values	-.02	-.04	-.02	-.04	.01	1.00	.01
Knowledge	-.08	.02	.21	.11	.15	.01	1.00

5.2.3 BLR - Discerning ecological priorities in Terra Nova National Park

Classification for the third model based on understanding of ecological integrity issues in TNNP is presented in Table 5.10. Binary logistic regression revealed that 85% of residents and 73% of visitors were correctly classified. Similar to previous classifications, 29 residents behaved as visitors, while 37 visitors demonstrated responses typical of residents. Overall 80% of cases were correctly classified.

Table 5.10
Classification of respondents based on two outcome groups: visitor and residents using Logistic Regression (Theme 3). (a)

		Predicted Group Membership		Percentage
	Observed	Resident	Visitor	**Correct**
Step 1	Resident	159	29	85
	Visitor	37	102	73
	Overall Percentage			80

a The cut value is .500

Table 5.11 presents regression coefficients (β) and standard error (S.E.), Wald statistics (Wald), significance of the Wald criterion (sig.), and odds ratios (exp β) using 95% confidence intervals for odds ratios for each of the seven predictors. According to the Wald criterion, only participation, anthropocentrism, and positive attitudes reliably predicted the group ($p < .05$). The other four predictors: ecological issues, poor EI knowledge, positive values and personal values did not reliably predict the group. For example, participation yielded a beta value of 2.15 with a significance level < .05. Furthermore, the odds ratios (exp β) indicates that if participation increases by one unit, the respondent is 8.59 times more likely to be a visitor. Likewise, if the score on positive attitudes increases by a score of one, the respondent is nearly three times as likely to be a visitor. A one-unit increase on anthropocentrism, results in the respondent being 2.2 times as likely to be a community resident.

Table 5.11
Logistic regression analysis of understanding ecological issues in TNNP as a function of value, knowledge, and attitudinal variables: visitors vs. residents.

Predictor	β	Wald Chi-square	df	Sig.	Odds ratio Exp(β)
Ecological issues	-.07	.23	1	.63	.93
Positive values	-.21	1.97	1	.16	.81
Participation	2.15	64.18	1	.00	8.59
Anthropocentrism	-.77	21.49	1	.00	.46
Positive attitudes	1.08	30.41	1	.00	2.95
Personal values	.33	3.72	1	.05	1.39
Poor EI Knowledge	.08	.26	1	.61	1.08
Constant	-.34	4.90	1	.03	.71

The correlation matrix below (Table 5.12) indicates the relationship between predictors. The strongest relationship among predictors is the positive correlation between participation and positive attitudes (.38) and the negative correlation between participation and anthropocentric attitudes (-.34). This indicates that as participation in park programs increases, positive attitude scores also increase, and vice versa. As might be expected, positive attitudes and anthropocentrism are negatively correlated with a loading of -.21.

Table 5.12
Correlation Matrix between predictors of understanding ecological issues in TNNP.

	Constant	Ecological issues	Positive values	Participation	Anthropocentrism	Positive attitudes	Personal values	Poor EI knowledge
Constant	1.00	-.06	.08	.05	.06	-.17	-.07	-.00
Ecological issues	-.06	1.00	.01	-.04	.04	.04	.05	-.04
Positive values	.08	.01	1.00	-.03	.09	-.06	-.01	-.04
Participation	.05	-.04	-.03	1.00	-.34	.38	.12	.01
Anthropocentrism	.06	.04	.09	-.34	1.00	-.21	-.10	-.00
Positive attitudes	-.17	.04	-.06	.38	-.21	1.00	.11	-.04
Personal values	-.07	.05	-.01	.12	-.10	.11	1.00	-.02
Poor EI knowledge	-.00	-.04	-.04	.01	-.00	-.04	-.02	1.00

5.3 Discriminant function analyses

A direct discriminant analysis was completed to evaluate the classification of cases based on two categories: visitors and residents. The primary purpose for the selection of this method was to confirm the results produced by the binary logistic regression. The

similarity in classification indicates consistency among the data. Fisher's linear discriminant functions are presented for each theme to further report the dichotomy between research populations. A bi-polar trend was evident for all predictors in each of the three themes. Visitors and residents demonstrated opposite levels of attitudes, values, and knowledge. Fisher's Linear discriminant functions also revealed that the single best predictor distinguishing between visitor and resident responses for all three themes was participation, loading at .77 for understanding Canada's national park system, .69 for local perspectives in TNNP and .75 for discerning ecological issues.

Homogeneity of variance-covariance matrices was assessed through Box's M for each of the three analyses. For the first theme, this test was statistically significant, χ^2 (21, 329) = 129.57, $p < .001$. Also, one discriminant function was calculated with canonical R^2 = .43, Eigenvalue = .75 and with a 95% confidence interval. This function accounted for 100% of variance. For the second theme, the test was statistically significant at χ^2 (21, 325) = 132.65, $p < .001$. Also, one discriminant function was calculated with canonical R^2 = .35, Eigenvalue = .53, and with a 95% confidence interval. This function accounted for 100% of variance. The test was also statistically significant for the third theme at χ^2 (28, 327) = 103.08, $p < .001$. Also, one discriminant function was calculated with canonical R^2 = .40, Eigenvalue = .66 and with a 95% confidence interval. This function accounted for 100% of variance. Wilks' Lambda was statistically significant for at χ^2 (6, 329) = 180.53, $p < .001$, χ^2 (6, 325) = 135.61, $p < .001$, and χ^2 (7, 327) = 162.73, $p < .001$ for all three themes, respectively.

The results from the multivariate analysis have been presented for each of the three main interpretation themes in TNNP: understanding of Canada's national park system, local perspectives in TNNP, and understanding of ecological issues in TNNP. Theme one, Canada's national parks, yielded six components that were labelled positive attitudes, participation, utilitarian ethics, anthropocentrism, and system knowledge. Theme two, TNNP, yielded six components that were labelled positive values, participation, false perceptions, positive attitudes, personal values, and park knowledge. The third theme, ecological integrity yielded seven components that were labelled ecological issues, positive values participation, anthropocentrism, positive attitudes, personal values, and poor ecological integrity knowledge.

Classification through direct logistic regression and discriminant analysis for each of the three themes revealed that each audience was well classified and the populations of each group relatively homogenous. For theme one, 84% of respondents were correctly classified; 79% and 80% were correctly classified for themes two and three, respectively. This indicates that within each group, participants tend to demonstrate similar responses, that is, differences arising between the two park audience with respect to attitudes or knowledge are likely a result of group membership.

For theme one, all predictors (components) with the exception of *utilitarian ethics*, reliably predict group membership. Increases in participation, knowledge, and positive

attitudes increased the odds that a respondent is a visitor, while increases in the scores for positive values or anthropocentrism increased the odds that the response was from a resident. For theme two, four predictors reliably predicted group membership, participation, false perception, positive attitudes, and knowledge. The two value-based predictors, positive values and personal values, did not reliably predict group membership. Similar to theme one, increases in scores for participation, false perceptions, positive attitudes, and knowledge increased the odds the response was from a visitor. For theme three, only three predictors, participation, anthropocentrism and positive attitudes reliably predicted the group. Increases in scores in participation and positive attitudes increased the odds the response was from a visitor, while increased scores on anthropocentrism increased the odd the response was from a resident.

For all three themes, the correlation matrix illustrated that the strongest relationships among predictors was between frequency of participation in park programs and positive attitudes. Discriminant analysis completed for all three themes confirmed these results and indicated that the single best predictor to differentiate between visitor and resident was participation.

The final section, Chapter Six, *Discussion*, will provide a synopsis of the findings from this research study as well as discuss limitations, recommendations, and application of the findings as they apply to the use of social scientific methods within parks and protected areas.

6.0 DISCUSSION

The introductory chapter of this thesis stated that social science methods yield effective tools to describe and understand society. This study was initiated as a response to TNNP's desire to validate the usefulness of social science research methods, meet the national directive to evaluate the effectiveness of the *Engaging Canadians* campaign, and strategically direct future interpretation programming. To re-iterate, the purpose of this thesis was to provide a measurement of visitor and community understanding with respect to the role of Parks Canada, the role of Terra Nova National Park in the National Park System, and key ecological issues in Terra Nova National Park - the three main themes interpreted in Terra Nova National Park. The three primary objectives included:

- Document baseline data to allow park managers to reassess and monitor changing knowledge levels and attitudes through quasi-experimental and non- experimental research, similar to multi-year studies in wildlife population monitoring;
- Evaluate and understand visitor and community general attitudes towards nature that may influence knowledge levels about park issues and general attitudes toward parks and protected areas;
- Compare visitor and community attitudes toward and knowledge levels of National and Local Park issues and document differences between these audiences to allow for specific recommendations with respect to each group;

The final chapter will present key findings as they relate to each of the primary objectives. In addition to quantifying the level of understanding of community residents and park visitors, the study reflects on the role of non-formal education in management planning processes and the impact of interpretation on understanding. Therefore, several secondary objectives were also identified and will be addressed in the discussion, including:

- Consider possible factors that influence visitor and community understanding and attitudes such as interpretation programming, socio-cultural factors, and demographics;
- Determine if participation in educational programming results in more positive attitudes and increased understanding; and
- Provide direction for park management planning, particularly interpretation program offer.

The results presented in chapters 4 and 5 established where knowledge gaps exist for both visitors and residents, thereby enabling TNNP to direct future interpretation programming to address such gaps and improve certain values and attitudes of these two key audiences. The collection of this information also meets another research objective by providing this baseline data that can be used to assess changes in knowledge, values, and attitudes over time, thereby allowing TNNP to measure whether asserted changes to targeted messaging has yielded an effect on the two key park audiences.

The literature review of published works highlighted the most appropriate methods that could be applied to visitor and parks research and investigated issues surrounding the interpretation of natural history and research related to interpretation in natural settings. This met yet another research objective that aimed to validate the usefulness of this type of research within a national park environment

This final chapter documents the key findings interpreted from the results, outlines limitations inherent in the study, and makes recommendations for future social science

research and for the re-application of the data collection instrument for measuring temporal changes in understanding.

6.1 Key Findings

Repeat visitors and community residents are considered by Parks Canada to be their two most vital audiences. These two groups are targeted with messages aimed to increase knowledge of national parks and positively influence attitudes both about national issues and at the local park level. The classification provided by both the discriminant analysis and logistic regression on each of the three research themes demonstrated that each audience was well classified and the populations of each group relatively homogenous. Overall correct classifications ranged from 79% to 84%. This suggests that within each group, participants responded similarly and that differences arising between the two park audiences with respect to attitudes or knowledge are likely as a result of the group in which an individual belongs.

The results presented in Chapter Four and Five, clearly demonstrate that visitors and residents differ significantly in knowledge, attitudes, and values with respect to each of the major research themes: (1) Canada's National Park System, (2) Terra Nova National Park, and (3) Ecological Integrity. The single most dominant factor differentiating the two key park audiences are attributes relating to participation in park activities and interpretation programming, followed by attitudes, knowledge, and values.

6.2 Participation

As documented in the results, visitors demonstrated much higher levels of participation than community residents. According to the definition of *repeat visitor* used in this study, visitors recorded at least 14 nights during the 2003 season. Results demonstrated that residents made more frequent day-use visits while visitors made less frequent multi-day trips. Repeat visitors demonstrated far higher levels of participation in the parks educational programming than community residents; in fact, participation among repeat visitors was significantly higher on each type of interpretation program with the exception of guided walks. Residents avail of the services at the visitor information centre more than other programs. At the multivariate level of analysis participation was the primary factor differentiating the two park audiences for each of the three models with repeat visitors demonstrating significantly greater levels of participation in each model.

It may be inferred that visitors to National Parks are exhibiting tourist behaviours by availing of as many and as varied opportunities that are offered by park staff. As documented in the park database and from the collected data, most visitors live in urban areas on the Avalon Peninsula of Newfoundland. While visitors are escaping the everyday life in more urban areas it is plausible that residents may avail of alternative tourism destinations to escape the routine that includes living adjacent to a national park. The explanation of the discrepancy may also be attributed to marketing and promotion that targets one population more than the other. Park education programming has

primarily focused on in-park programs, most of which are offered in the campgrounds, making it easy and convenient for visitors to participate. The messages delivered in personal programs are then reinforced at other venues in the park including the visitor information centre or the children's Nature House. Visitors would naturally be more aware of the programs being offered and more likely to participate since there are less competing opportunities that may be present in the surrounding communities for the local residents.

Residents expressed that experiences found in TNNP could be found elsewhere indicating that they may take advantage of similar recreation opportunities offered in their communities or elsewhere. Satisfaction surveys may provide a better understanding of motivations for participation or lack of participation in park activities. While visitors have been accustomed to expect first-rate educational programming and entertainment, residents are not availing of the recreational and educational opportunities offered in the park. Residents may not be as aware of in-park programs, unaware that they are openly invited to participate or not value this experience as an opportunity to learn about parks and enjoy nature.

The difference and documented importance of participation raises some interesting questions regarding the possible influence of increased participation on knowledge and attitudes. As cited in the literature, educational efforts might be more effective if the focus is on influencing attitudes (Wiles & Hall, 2005; Bright *et al.*, 1993). In this study,

exploratory analysis revealed that participation may contribute to positive attitudes towards the national park system, local issues in Terra Nova National Park, and ecological integrity. Further investigation of this relationship is warranted to explore the causal nature of this interaction. There appeared to be less influence on knowledge levels although there is no comparative data from previous years to measure any improvement over time. This is consistent with the findings from recent research that question the effect of programs on knowledge (Leeming *et al.* 1997) although DiEnno and Hilton (2005) did confirm that experiential based programs significantly improved knowledge scores.

6.3 Attitudes

Visitors demonstrated significantly more positive attitudes toward the national park system than residents, although generally both audiences showed positive attitudes toward the national park system in terms of positive attitudes toward the Parks Canada Agency and the opportunities that national parks provide to Canadians. These findings are supported by the results from the logistic regression that suggest visitors have significantly more positive attitudes and that residents demonstrate more anthropocentric attitudes towards the national park system. There were some alarming exceptions. For example, less than half of visitors agreed that maintaining a healthy environment is more important than providing camping facilities. We may infer that the recreational experience is far more valued than any ecological value of national parks. Also, nearly a third of community residents supported the harvesting of natural resources within

national parks. This demonstrates that residents may perceive the park as an impediment to continuing the resource practices of the past and to accessing park resources in the present and future.

With respect to local attitudes towards TNNP, both levels of analysis documented that visitors again demonstrated significantly more positive attitudes, although both groups were generally positive towards park staff and management and the opportunities provided in the park. This is to be expected as the park is a chosen destination for visitors to the park; we can assume that there is a positive connection to their chosen destination. There are several exceptions. Visitors viewed the level of protection for wilderness as satisfactory while local residents indicated the need for more protection, contradicting residents' desires to harvest park resources. However, residents expressed that experiences found in TNNP can be found elsewhere and are not unique to national parks. This is explained by low participation in park programming. Local residents do not avail of the full park experience, therefore, the park is not perceived as offering a unique experience. Yet, only half of residents agreed that TNNP has enough camping facilities.

The third theme, investigating attitudes towards specific ecological concerns in TNNP, documented a general uncertainty about ecological issues with no strong attitudes on any issue with the exceptions of the Newfoundland marten and the suggested removal of moose from the park ecosystem. As for previous themes, the discriminant analysis

revealed that visitors were significantly more positive than residents, while residents scored higher on anthropocentric attitudes. Although visitors were more positive than residents, attitudes appeared to be very issue-specific. For example, although attitudes towards the Newfoundland marten were strongly positive, visitors demonstrated significantly more positive attitudes than residents. There was a documented indifference towards introduced species with exception to attitudes towards the removal of moose from the park ecosystem, neither visitors nor residents agreed that moose should be removed from the park to curb the effects of moose herbivory in TNNP. The issue of fire elicited an interesting response as well. Both audiences acknowledged that fires have positive ecological impacts yet residents were significantly more likely to suggest that all fires in the park be suppressed and significantly less likely to support a prescribed burn. This may reflect a perceived threat to property and life as well as an incomplete understanding of the consequences of fire suppression in a fire dependent ecosystem.

There are several hypotheses that may explain the less positive attitude among local residents. Since the park was established, there has been lingering discontent and resentment towards park politics. Many of the families that were displaced as a result of the dedication of TNNP in 1957 still live in the local areas. The resettlement policies still continue to breed conflict between park administration and local residents. Attitudes may reflect differing values. Residents demonstrated more instrumental and consumptive values than visitors which may be linked to more anthropocentric attitudes.

6.4 Knowledge

Visitors demonstrated consistently higher levels of knowledge than community residents with respect to each of the three themes. On indicators of national park roles, both groups recognised the most important roles sanctioned by the Parks Canada mandate: ensure the protection of ecological integrity, present nationally significant examples of Canada's natural regions, protect natural process, and leave natural areas unimpaired for future generations. Results from the logistic regression showed that visitor knowledge of the national parks system was significantly higher than residents, although knowledge of the park system was meagre overall with both groups not recognising the incompleteness of the parks system or the need to create additional parks. In addition, both groups showed difficulty naming national parks outside of Newfoundland and Labrador showing a general lack of knowledge regarding national parks in Canada.

Knowledge of local park issues and roles was also consistently superior among visitors. While both groups stated the most important roles of TNNP with ease, they had considerable difficulty deciphering which roles were false. The results of the logistic regression documented that visitors showed significantly greater knowledge about TNNP but also that visitors were twice as likely as residents to perceive mythical information about the park as true statements. The superiority of visitor knowledge of park issues and national parks issues may be linked directly to participation in experience-based programming. Consistent with Bacon (1983) and Gass (1995), programs based on such experiential learning theory are more effective in the long-term transfer of learning.

DiEnno and Hilton (2005) also found that constructivist education methods elicited significantly improved knowledge levels. Visitors are more likely to participate in well-crafted programs with carefully designed metaphors and facilitated by skilled interpreters, whereas residents are less exposed to these types of programs and educational programs in general.

Knowledge of ecological integrity was weak among both groups particularly in reference to recognising the most important ecological concerns for TNNP. On indicators of knowledge of the meaning of ecological integrity, residents exhibited marginally higher levels of knowledge than visitors. This was further documented in the logistic regression that confirmed visitors had marginally poorer knowledge of ecological integrity than residents although the difference was not significant. In recent years, the park has conducted several community involvement programs and research studies on specific ecological issues and may have influenced local knowledge about ecological concerns and priorities for Terra Nova National Park. This may provide one explanation for higher levels of ecological knowledge among community residents. Also, residents are more directly impacted by decisions affecting the greater TNNP ecosystem and therefore have a greater interest in these types of issues.

As alluded to in the section on participation, the importance of knowledge has been debated. Many researchers question the influence of increased knowledge on attitudes and positive stewardship behaviours (Wiles & Hall, 2005). Researchers would benefit

from following in the footsteps of Loomis (2002) who focused on how knowledge is used rather than mere knowledge production. Study of these interactions would be useful for interpretative managers.

6.5 Values

The values portrayed by both audiences suggest that national parks are perceived to be of great human benefit. The analysis of park values revealed that instrumental and instrinsic values were well balanced among both park audiences. Anthropocentric values of the national parks were more prevalent among residents than visitors. Consistent with Negra and Manning (1997), spiritual values were generally perceived as unimportant while personal, therapeutic, and intellectual values were somewhat important, and significantly more so to visitors. While economic and resource values were generally not perceived as important, they were both significantly more important to residents. While it is apparent that humans are more inclined to value instrumentally than intrinsically, both groups indicated that protection of the environment was the most important value of national parks followed closely by aesthetic, recreational, and moral values. Similarly, Negra and Manning (1997) found that ecological and educational values were most important to visitors in a Vermont State Park and suggested that management priorities should shift to represent these values deemed as most important to their "clients." According to this logic, management priorities in TNNP should focus on recreational opportunities and ecological roles. Winter and Lockwoord (2005) concur with this philosophy as their research concluded that not only may strong values affect attitudes towards decision-

making but also that educational programmes would be most effective if they address the values perceived as most important by park audiences. Values may have considerable influence on attitudes towards national parks and ecological issues within national park issues. These findings suggest additional research on the relationship between park values and park attitudes would help to reveal insights on this matter.

With respect to the national park system, the discriminant analysis revealed that there was no significant difference between groups with regard to positive values as a complete factor, although Fisher's linear co-efficients did reveal bi-polarity between the two audiences with residents scoring higher on positive values than visitors. In the second and third model pertaining to local understanding of Terra Nova National Park and ecological issues, respectively, values were divided into two factors: positive values and personal values. In the second model, visitor and resident responses were nearly identical with no significant difference. The third model also revealed no significant difference but bi-polarity was evident with visitors perceiving personal values as more important than residents whom also perceived positive values as more important than visitors. The differences exhibited between these groups suggest that park interpretation planning should address the two audiences separately; designing programs that address the knowledge gaps for each particular group and develop programs that appeal to the prominent values demonstrated by each group.

6.6 Summary of Applied Findings

To summarize, several items need to be better communicated to both audiences. These items include:

- Parks Canada represents an incomplete system of parks, each representing a specific ecosystem in Canada. Communicating messages about other national parks can enhance the feeling that TNNP is a unique place.
- The role of the Parks Canada Agency is to ensure the ecological integrity of each of these ecosystems for future generations and conversely that the Parks Canada Agency is not dedicated to creating economic opportunities.
- Parks Canada is also responsible for the protection of Canada's culture heritage, primarily through the administration of a network of National Historic Sites.
- Visitors and residents lack an understanding regarding the ecosystem that TNNP protects.
- For both audiences, misconceptions regarding the role of TNNP in the development of resources must be clarified.
- Both audiences believe the forest in TNNP to be healthy. The poor health of the forest ecosystem and factors attributing to forest health are keys messages that need to be communicated. If the forest is perceived as healthy, visitors will be more likely to put more emphasis on other issues such as visitor services or for residents, resource extraction. If the detrimental state of forest health was communicated to these audiences it would be easier to garner support to forest management initiatives.
- Maintaining ecological integrity is the fundamental role of national parks yet it is an unknown concept for many residents and visitors. Park messaging must focus on improving knowledge surrounding its key ecological issues, including what it means to maintain ecological integrity and important of restoring natural processes. Often these messages are "sugar-coated" under the guise of entertainment where the intensity and importance of the issues may be lost.
- One specific ecological issue that is poorly understood is the impact of introduced species. As one of the most growing concerns for TNNP, effective communication is imperative to address this issue.

Items that need to be better communicated to visitors include:

- The most alarming result was the importance on visitor services above maintaining a healthy environment. Naturally, people regard national parks as healthy natural environments. In TNNP, it must be communicated that the forest as it has existed can not persist. This is evident by increasing windfalls that are negatively perceived by visitors. To sustain the current camping experience, it is imperative that the health of the ecosystem in maintained (or remediated).

- There is a great opportunity to involve visitors in the work of the park. Repeat visitation patterns allow for involvement in volunteer monitoring projects over the course of the visitor season.

Finally, there are many items that should be considered in the development of programming within the liaison communities. These items include:

- Residents reported a desire to be involved in park planning. Public consultation on key ecological issues may be an effective way to share messages relating to ecological integrity.
- There are underlying economic and resource values of the land that may be a barrier to positive attitudes and support from residents with respect to management decisions. Communicating the value of protection and the rationale for the exclusion of resource use will be critical to garnering support from local communities for park management decisions.
- Focus on engaging residents in "on location activities" to help foster a positive connection to the nature and to the uniqueness of the experiences offered in TNNP and help to foster general support for park initiatives. Residents don't perceive TNNP as offering a unique experience. Many residents view the same landscapes all around their communities and therefore see no difference in the Park from their own backyards.
- Similarly, bringing the work of the park into the local communities can help to relate messages but lacks the connection that can only be felt while submersed in the natural park environment.
- Residents also exhibited a lack of trust in park staff. Improving relationships and building partnerships in local communities can enhance public opinion of TNNP and support to park initiatives.
- While residents did not necessarily display negative attitudes, attitudes were generally less positive than visitors and were also less knowledgeable. Increasing resident programming or increasing resident participating in in-park programming may help to increase both knowledge levels and improve attitudes towards the Park.
- There is an apparent concern regarding fire and the use of prescribed burns. Messaging and specific programs relating to this and other poorly understood ecological issues are warranted.

6.7 Limitations

There were several issues limiting the potential of the research that must be addressed prior to the implementation of future social science studies in TNNP. Reminders/thank you cards were rendered ineffective in this study, particularly for repeat visitors. An ill-

timed labour dispute and federal election interrupted the mail-out process possibly influencing survey response rates. Excessive time elapsed between the pre-notification calls to community residents and the mail-out of the questionnaire, weakening the effectiveness of the survey procedure. The 2003 repeat visitor database provided by TNNP was outdated, many surveys were returned to sender and many visitors had been deceased as early as 1999. The survey was originally scheduled for late winter, early spring – the best documented time for mail-out surveys, unfortunately due to unforeseen delays, the mail-out was conducted during the summer. As a result of the rush to get the survey out, a proper pilot study was not completed resulting in several poorly worded questions and measurements despite having been developed in partnership with park staff and academics.

Response rates were generally much lower than expected and lower than similar studies conducted in TNNP with the same audiences. However, the samples were still statistically large in size and allowed for comparison and testing for statistical significance. The discrepancy in gender response rates may have been an issue, although testing for gender differences revealed there was no effect. Respondent selection occurred randomly; however, entries in the park database were more likely to have male names associated with them. This may account for the higher percentage of male responses.

The inclusion of more qualitative research in this study would have added greater value to the quantitative results. Qualitative information collected from the two audiences may have provided more insight and allowed for greater interpretation of the results. However, the quantitative analysis clearly illustrated the key variables and themes underlying how respondents feel about park management issues.

6.8 Suggestions for Future Research

Recommendations have been communicated to park management based on re-applying the methods used for this study to obtain comparative data to be used in longitudinal studies that explore changes in knowledge, attitudes, and values over time and reflecting changing educational priorities. First, it is suggested that TNNP implement a quantitative, non-experimental survey research design to evaluate and compare attitudes and understanding. Second, the survey should be shortened to eliminate poorly defined or redundant variables, decrease the overall length of time for completion, reduce the per-item cost of postage, and eliminate non-influential predictors of understanding or attitudes using the results from the principal components analysis. It is recommended that an abridged version be administered in future longitudinal studies that attempt to discern differences in understanding and attitudes over time. The items and measurement definitions should remain consistent to ensure reliability of the results.

Future studies should ensure that the repeat visitor database is current. The data was believed to have been collected in 2003, however, data collection revealed cases of death

prior to 2000. An up to date visitor database provides opportunities to implement research in an easier and effective manner. Pre-notification has been shown to significantly increase response rates. Repetition of this research must ensure that questionnaires are ready to mail the next business day to optimise the influence of the pre-notification phone call. Also, thank you/reminder cards are typically mailed to the entire sample. Many studies show that such cards boost response rate. To increase the effectiveness of this card, reminders should be distributed within 2-weeks of the initial mail-out.

Park management may consider internet-based survey methods administered in-park for visitors to augment response rates and allow automated data entry. This method could be applied to the local residents in the surrounding communities if a location was established to allow internet access to research participants. If a mail-out strategy is used, it should be completed between January and April to augment response rates. This has been documented as the best time to deliver mail-out surveys. Furthermore, this study should be implemented based on a 5-year rotation and one-year prior to management planning to measure changes in understanding and adapt educational priorities accordingly. An external contractor specialising in social science increases the credibility of social science research studies and lends to information marketing within the scientific community. Research could be administered in-house if the specialisation in social science exists internally. To counter the cost of administration, contracts could be designed with the pre-notification, survey production, mail-out, reminder mail-out, and data entry

performed in-house by student staff, as long as proper training and direction is given by a social science specialist. At the very minimum, statistical analyses and results should be reviewed externally with reports compiled by the social science specialist, either contracted or internal.

Further investigation of the interrelationships between participation in non-formal educational programming, knowledge, attitudes, and values is required from the research community to help guide the type of messages and programs that would be most effective for garnering community and public support for management decisions and ecological initiatives within national parks and other types of protected areas. In fact, many other field researchers and professionals working in natural areas have advocated for increased attention to social science at the management and field levels and that such research is equally valuable alongside traditional sciences in the management of protected areas (Dearden & Rollins, 1993; Payne & Graham, 1993; Vander Stoep, 2004; and Zarki, 2004). Qualitative work is equally important in developing an understanding of people and their relationships and interactions with national parks and natural environments in general. Consistent with the findings of Knudsen *et al.* (2003), this study reinforces that human dimensions research, within the broader context of social science, is critical to understanding the dynamic relationships between humans and their environmental contexts.

6.9 Conclusions

To summarize, this thesis has presented the results of the research study as directed by the objectives set forth in the first chapter, *Introduction* that provided the rationale and direction for the research. Chapter Two, *Methodological Review*, presented peer reviewed literature on common social science methods used in visitor and park research. Chapter Three, *Methodology*, outlined the methods chosen to evaluate visitor and community understanding of three research themes: (1) Canada's national park system, (2) local perspectives in Terra Nova National Park, and (3) understanding of ecological integrity issues in Terra Nova National Park. The fourth chapter – *Univariate Results*, presented the descriptive results based on the original items in the data collection instrument, while the fifth chapter, Multivariate Results, presented the results of three advance statistical procedures based on a compressed data set. This final chapter, Chapter Six, *Discussion*, has presented the key findings and recommendations for future research projects.

The application of social science methods to visitor and community research in Terra Nova National Park was effective and yielded useable results that should be used to address knowledge gaps through park messages by non-personal and personal delivery of educational programs. National Parks must incorporate social science into the planning, delivery, and evaluation of educational programs through a targeted Interpretation offer that address the gaps in audience knowledge. Programs must also attempt to elicit emotive and affective responses from park audiences to help build a positive attitudinal

response to National Parks and the importance of protected areas. Educational programs should address misperceptions among visitors and communities and target the lack of understanding exhibited by communities. Strong educational, affective, and experiential programs have been proven to strengthen understanding and attitudes. This type of educational programming plays an important role in connecting national park audiences and Canadians to the natural environment.

National parks provide a vehicle for positive environmental attitudes and it is imperative to ensure that national parks provide opportunities for learning and enjoyment for future generations, while protecting the natural processes and components that are protected within them. Understanding the people who use national parks and the people who live adjacent to national parks and by involving park audiences in the important work undertaken within these special places will help to improve attitudes, promote the values of national parks, and realise the sociological and ecological potential of Canada's national park system.

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Appendix A: Questionnaire

Terra Nova National Park Study
Questionnaire
2004

Id #:	
DR:	
V/C:	
DE:	
On:	

Dear

Thank you for participating in this study and taking a few minutes of your time to answer the following questions about ecological integrity and the roles of Parks Canada and Terra Nova National Park (TNNP). Your answers are important in guiding TNNP in the development of programs and services that increase education opportunities for both local communities and visitors to TNNP. Please answer the following questions as completely as possible and return the survey in the envelope provided. Your participation in this study is voluntary and any information you provide is strictly confidential.

Thank you for your help,

Sincerely,

Terra Nova National Park

If you have any additional questions regarding this study, please contact (709) 533-2801.

Section 1: PARKS CANADA

1. Have you heard of Parks Canada? **YES** **NO** **Not sure**

2. How many national parks are there in Canada? _____

   Is this... **Not enough** **Just enough** **Too many** **Not sure**

3. Are the following statements about Parks Canada True or False?

	Generally True	Generally False	Not Sure
a) The national park system is incomplete	T	F	N
b) National parks have been privatised in many parts of Canada	T	F	N
c) The Parks Canada Agency is responsible for National Marine Conservation Areas	T	F	N
d) National parks are managed by their respective provincial governments	T	F	N
e) There is currently one or more national parks covering each natural region in Canada	T	F	N
f) The Parks Canada Agency is responsible for the management of National Historic Sites	T	F	N

4. Name 5 national parks in Canada.

   _____

   _____

   _____

   _____

   _____

5. Which of the following statements are true roles of the Parks Canada Agency?

	Generally True	Generally False	Not Sure
a) protect and present nationally significant examples of Canada's natural heritage	T	F	N
b) protect natural resources such as timber or minerals for future development	T	F	N
c) create employment opportunities for local communities	T	F	N
d) foster public understanding, appreciation, and enjoyment	T	F	N
e) protect natural processes and components of Canada's natural regions	T	F	N
f) develop tourism in communities adjacent to park	T	F	N
g) represent the natural regions of each province and territory of Canada	T	F	N
h) increase recreational fishing within parks	T	F	N
i) ensure the ecological integrity of these natural places for future generations	T	F	N
j) ensure that camping facilities meet the needs of Canadians	T	F	N
k) ensure the protection of our cultural heritage	T	F	N
l) represent the 39 natural regions of Canada	T	F	N

Which of the previous statements is the most important role of Parks Canada? (Select only one).

_____

6. Do you agree or disagree with the following statements about our national parks?

SD-*strongly disagree* **D**-*disagree* **N**-*neutral* **A**-*agree* **SA**-*strongly agree*

	SD	D	N	A	SA
a) protection of natural areas requires the co-operation of all Canadians	1	2	3	4	5
b) provinces should be allowed to use resources in national parks	1	2	3	4	5
c) wilderness preservation is a worthwhile goal	1	2	3	4	5
d) national parks provide unique experiences not provided elsewhere	1	2	3	4	5
e) visitor services should be a higher priority than protecting the natural environment	1	2	3	4	5
f) national parks are fun places for children	1	2	3	4	5
g) national parks are places that adults can enjoy	1	2	3	4	5
h) Parks Canada is a trusted guardian of Canada's natural areas	1	2	3	4	5
i) people should be able to use the park without restriction	1	2	3	4	5
j) national parks provide opportunities to learn about nature	1	2	3	4	5
k) people are more important than wildlife within national parks	1	2	3	4	5
l) visitors should be more involved in park planning	1	2	3	4	5
m) national parks belongs to Canadians	1	2	3	4	5
n) national parks symbolise the beauty of Canada's wilderness	1	2	3	4	5
o) maintaining a healthy environment is more important than providing camping facilities	1	2	3	4	5
p) communities should be more involved in park planning	1	2	3	4	5

7. Place an X on the line to indicate the importance of the following reasons to have national parks on a scale from 1-10 where 1 is not important and 10 is extremely important. Example given: national parks is very important to provide a place for personal reflection.

	Not important		Extremely important
a)	1	Personal reflection and solitude X	10
b)	1	Religious or spiritual matters	10
c)	1	Cultural knowledge	10
d)	1	Physical health and well-being	10
e)	1	Appreciation of natural beauty	10
f)	1	Conservation of the environment to ensure human survival	10
g)	1	Scientific research	10
h)	1	Learn about nature	10
i)	1	Outdoor recreation activities	10
j)	1	Somewhere to think and contemplate	10
k)	1	Moral obligation to respect and protect other living things	10
l)	1	Enhance the economy	10
m)	1	Source of resources for future societies	10

Of the previous statements, which is the most important reason to have national parks? (select only one)

_____

Section 2: TERRA NOVA NATIONAL PARK

1. a) Have you visited TNNP? **YES** **NO**

   b) If yes, how many times per year do you visit TNNP? _____

   c) On average, how many nights do you stay per visit? _____

   d) If you stay overnight, where do you stay? (Check one).

   ___RV Newman Sound ___Hotel/Motel ___Tent Newman Sound

   ___RV Malady Head ___Friends/Family ___Tent Malady Head

2. Have you participated in the following park activities? If yes, estimate the number of times per season (may to august).

	YES	NO	If yes, how many times?
a) Outdoor theatre programs	Y	N	
b) Nature house activities	Y	N	
c) Guided walks	Y	N	
d) Self-guided trails (with interpretative signs)	Y	N	
e) Special events (Kids' Day, Parks Day, etc.)	Y	N	
f) Campfire	Y	N	
g) Visitor Centre (Marine Interpretation Centre)	Y	N	

3. Are the following statements about TNNP true or false?

	Generally True	Generally False	Not Sure
a) TNNP is part of a larger system of protected areas	T	F	N
b) The golf course is not operated by TNNP	T	F	N
c) Black spruce and balsam fir dominate the vegetation	T	F	N
d) The are communities inside the boundaries of TNNP	T	F	N
e) TNNP has a healthy forest that will persist generations	T	F	N

4. Which of the following statements are roles of Terra Nova National Park?

	Generally True	Generally False	Not Sure
a) protect a unique natural region of Canada	T	F	N
b) protect the long range mountains rising abruptly from coastal plains	T	F	N
c) protect ponds, lakes, bogs, and wetlands	T	F	N
d) maintain and restore the boreal forest ecosystem	T	F	N
e) develop the economies of local communities	T	F	N
f) provide enjoyment for all Canadians	T	F	N
g) protect Canada's rare tundra vegetation	T	F	N
h) protect fisheries in Bonavista Bay	T	F	N
i) provide learning experiences for visitors	T	F	N
j) protect habitat and living creatures that live there	T	F	N
k) protect the sheltered ocean environment	T	F	N
l) protect timber resources for future development	T	F	N
m) provide visitors with first-class golfing facilities	T	F	N
n) protect cultural and historical significance of the area	T	F	N
o) protect a representative example of the island boreal forest	T	F	N

Which of the previous statements represents the most important role of TNNP? (select only one).

_____

5. Do you agree or disagree with the following statements about TNNP?

SD-*strongly disagree* **D**-*disagree* **N**-*neutral* **A**-*agree* **SA**-*strongly agree*

	SD	D	N	A	SA
a) has enough camping facilities	1	2	3	4	5
b) has staff that can be trusted to protect the heritage of TNNP	1	2	3	4	5
c) provides experiences that are not provided elsewhere	1	2	3	4	5
d) provides learning opportunities	1	2	3	4	5
e) is not as important as other national parks in Canada	1	2	3	4	5
f) symbolises the natural beauty of Canada	1	2	3	4	5
g) does not have enough protection for wilderness	1	2	3	4	5
h) belongs to the people of Canada	1	2	3	4	5
i) should place more importance on visitor service than wildlife	1	2	3	4	5
j) is effectively managed by park staff	1	2	3	4	5

Section 3: ECOLOGICAL INTEGRITY

1. Have you heard of ecological integrity? **YES** **NO** **Not sure**

2. Define ecological integrity in your own words (one or two sentences).

_____

_____

_____

_____

Name one of the main threats to the health of the ecosystem in TNNP?

_____

3. Do you agree or disagree with the following statements about Terra Nova National Park?

SD-*strongly disagree* **D**-*disagree* **N**-*neutral* **A**-*agree* **SA**-*strongly agree*

	SD	D	N	A	SA
a) visitor use should be restricted along wilderness trails	1	2	3	4	5
b) the number of fishing permits should be unlimited in TNNP	1	2	3	4	5
c) introduced species negatively impact the ecology of the park	1	2	3	4	5
d) TNNP is large enough to manage wildlife populations	1	2	3	4	5
e) Newfoundland marten are unique	1	2	3	4	5
f) prescribed burns can be safely used to replace the natural fire cycle	1	2	3	4	5
g) forest insect outbreaks should be controlled in TNNP	1	2	3	4	5
h) fires in TNNP have no positive ecological impacts	1	2	3	4	5
i) the TCH does not affect wildlife in TNNP	1	2	3	4	5
j) snowshoe hares have a positive impact on forest regeneration	1	2	3	4	5
k) fallen trees and windfalls should be cleared from the forest	1	2	3	4	5
l) wasps and ants should be controlled in the campground	1	2	3	4	5
m) trees should be planted to restore natural forests in TNNP	1	2	3	4	5
n) moose populations should be reduced since they are not native to our ecosystem	1	2	3	4	5
o) all fires should be suppressed in the park	1	2	3	4	5
p) It is important to protect the Newfoundland marten	1	2	3	4	5

4. Place an X on the line to indicate the importance of the following issues to ecosystem management in national parks, on a scale from 1-10 where 1 is not important and 10 is extremely important. Example given: Air pollution is not very important.

	Not important		**Extremely important**
a)	1	Air pollution (X)	10
b)	1	Ageing forest due to absence of natural fire cycle	10
c)	1	Tourism development near park	10
d)	1	Survival of endangered species	10
e)	1	Acid rain	10
f)	1	Roads and highways fragmenting habitats	10
g)	1	Forest harvesting near park	10
h)	1	Sport fishing in or near park	10
i)	1	Hunting and trapping near park	10
j)	1	Impact of introduced species on forest health	10
k)	1	Landfills near park	10
l)	1	Mining activities near park	10
m)	1	Visitor impacts on habitat	10
n)	1	Marine pollution	10

If there is there another issue that you feel is important to ecosystem health in TNNP, please name?

_____

5. Are the following statements about ecosystem health true or false?

	Generally True	Generally False	Not Sure
a) ecosystem health is only the responsibility of park staff	T	F	N
b) a high level of ecological integrity means that the ecosystem is characteristic of its natural region	T	F	N
c) ecological integrity means that natural conditions present before humans modified the land are present	T	F	N
d) to maintain a healthy ecosystem, it is important to restore natural processes such as fire	T	F	N
e) ecosystem health is threatened by natural disturbance	T	F	N
f) protecting ecological integrity means excluding humans from the environment	T	F	N
g) all persons using the park can help maintain the ecological integrity of national parks	T	F	N
h) the health of the ecosystem is not impaired by visitor use	T	F	N

Section 4: PERSONAL INFORMATION

1. Age: _____
2. Gender: Male Female
3. City: _____