

**University of Alberta**

Acquiring an Improved Understanding of Willmore Wilderness Park Visitors, Alberta,  
Canada

by

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in partial fulfillment of the requirements for the degree of

Master of Arts

in

Recreation and Leisure Studies

Physical Education and Recreation

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## DEDICATION

This thesis is dedicated to the people who truly care about Willmore and have the passion to share its splendor; the amazing biodiversity that exists in and around the park; and the many hard-working horses that travel the rugged trails within. May Willmore exist perpetually as it has throughout the ages.

“Wilderness is not a luxury but a necessity of the human spirit, and as vital to our lives as water and good bread. A civilization which destroys what little remains of the wild, the spare, the original, is cutting itself off from its origins and betraying the principle of civilization itself.”

– Edward Abbey, *Desert Solitaire*

## ABSTRACT

The fundamental challenge of wilderness stewardship is balancing social and ecological values while ensuring wilderness qualities are preserved. This thesis contributed to an improved understanding of wilderness visitors, and more specifically addressed the need for acquiring an improved understanding of visitor use in Willmore Wilderness Park, Alberta, Canada. A mixed-methods approach including: trail surveys, in-depth mail surveys, trail cameras, Global Positioning System (GPS) Tracksticks, and in-person/telephone interviews were utilized. Specifically, visitation levels to the main staging areas, visitor and trip characteristics, motivations, familiarity, risk perceptions, management preferences, and visitors' relationship to Willmore were examined. A total of 195 trail surveys were completed and an 89% ( $n = 85$ ) response rate from the associated in-depth mail survey was achieved. A Trackstick distribution success rate of 77% ( $n = 24$ ) was obtained and 17 parks users were interviewed. By understanding more about park users and what they prefer or desire in Willmore, this project will help to balance conservation with recreation objectives.

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This project entailed over three years of effort and as time ticked away, change occurred, and with change came new opportunities as well as challenges. This thesis compelled me to be a stronger person. I firmly believe the human spirit enables one to achieve anything that one puts their mind to. Much gratitude goes to my family and my husband for their unconditional support not only with this project but with my life in general.

To the users of Willmore who supported this project by either keeping an open mind to the project, survey completion, offering advice and information, agreeing to use GPS Tracksticks, or participating in an interview – you are all amazing people and I really appreciate your time and effort in helping make this project possible. Your commitment shows your true passion for Willmore.

I hope the various audiences that review this thesis enjoy the content on the following pages. It is my sincere hope that the information helps foster and promote future studies, stewardships plans and knowledge gained about Willmore. It is the hope that this project adds to the foundation of knowledge related to Wilmore, and will help insure the future of this wild and wonderful place, and other places like it.

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## List of Acronyms

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ATPR	Alberta Tourism, Parks and Recreation
CTR	Commercial Trail Rider
DNR	Department of Natural Resources
GB	Gigabyte
GIS	Geographic Information System
GPS	Global Positioning System
GSM	Global System for Mobile Communication
MB	Megabyte
MPA	Marine Protected Area
MPB	Mountain Pine Beetle
NWPS	National Wilderness Preservation System
OHV	Off-Highway Vehicle
PER-ALES-NS- REB	Physical Education and Recreation, Agricultural Life and Environmental Sciences and Native Studies Research Ethics Board
PDA	Personal Data Assistant
PPGIS	Public Participation Geographic Information Systems
REP	Recreation Experience Preference
SPSS	Statistical Package for Social Sciences
SSSI	Sites of Special Scientific Interest
UNESCO	United Nations Educational, Scientific and Cultural Organization
URL	Uniform Resource Locator
USB	Universal Serial Bus

## 1.0 INTRODUCTION

---



*“It’s hard to describe because you could talk about it for hours and people would never understand what it’s like. You’ve got to see it to believe it. The government always advertised “take an Alberta break,” and that’s where you should go to take it. It’s probably one of the nicest spots in Alberta. There’s no motorized vehicles there, and that’s what makes it nice. If you hear any noise out there, you’re probably making it yourself” - Anthony*

## 1.1 Project Background and Rationale

Understanding wilderness uses and users is essential to wilderness management and decision-making (Hendee & Dawson, 2002). “An understanding of the amount, character, and distribution of recreational users is essential to wilderness management because such use is the cause of many impacts, the source of many wilderness values and potential funding” (Hendee & Dawson, 2002, p. 369). Frequently managers are trying to strike a balance between managing human use, insuring high quality wilderness experiences are maintained, while also insuring the maintenance of ecological integrity and functioning. The preservation of protected wilderness is critically dependent on the stewardship and management of areas after their legal designation or identification as wilderness areas (Hendee & Dawson, 2002). Many wilderness values develop from wilderness use; however so do threats to wilderness (Lucas, 1989). Most management challenges arise from human use, therefore wilderness management is more about managing people than the wilderness (Lucas, 1989). Management is inherently challenging and complex; without sound information related to the character of use, effective wilderness management is not possible (Lucas, 1989). Questions including: what motivates users to visit an area, what relationship does the visitor have with the area and what experiences are being sought, remain a challenge for managers within wilderness and protected areas around the world. This challenge can become even more complex for wilderness areas where little or no visitor information exists.

Watson, Cole, Turner, and Reynolds (2000) revealed through the U.S. National Wilderness Preservation System managers were making management decisions without reliable information on the recreation use and activities occurring in these areas. Essentially managers made decisions based on their estimated perception of use and motivations, rather than actual use and motivations. This can lead to making management decisions in a reactive manner rather than in a proactive, informed and dynamic manner. This latter form of decision making seems much more desirable within the context of park management. Gaining an understanding about the “where” component of visitors is also becoming more critical. Though the locations people visit, their routes of travel and temporal aspects of their visit are some of the most basic facets of recreation information, they are very relevant data (Hallo et al., 2012). The collection of visitor use information is collectively known as *visitor monitoring*, and it has been found to be critical in a variety of facets of protected areas management (Wolf, Hagenloh, & Croft, 2012). Visitor information is essential at differing levels: local land managers and staff, tourism development,

regional, national, and international policy, planning, reporting, monitoring, research, and comparisons (Kajala et al., 2007). Often, area users and the general public are interested in learning this information and they also have the right as citizens to be made aware of visitation information (Kajala et al., 2007).

In Alberta, Canada there has been few studies that have focused on park visitors in provincial wilderness areas. Existing historical user-profile data collected for Willmore Wilderness Park are sparse and out-of-date, and due to the park's physical remoteness, there have been few attempts to gather relevant information of this kind. As such, visitor information for Willmore Wilderness Park has been identified by park managers as an important knowledge gap in park management. Willmore Wilderness Park is popular both recreationally and ecologically, so a solid evidence-based management plan based on sound visitor information is required. Willmore is an excellent example of where gaining an improved understanding of park visitors would provide useful information for park managers and personnel, commercial operators, the park visitors themselves, special interest groups or user groups, and the general public.

## **1.2 Research Purpose and Research Questions**

The purpose of this study was to acquire an improved understanding of Willmore Wilderness Park visitors. Within the context of this study, the definition of a *park visitor* was any person who used the park for day or overnight use for recreational or commercial (e.g., commercial trail riders, guides, hunting outfitters, registered trappers) activities. Horse and mule users were also interchangeably referred to as *packstock* users. Visitors were also referred to as a *park users*, and within the context of this thesis, the two terms will be utilized interchangeably. A park visitor may also be classified as either a *local* or a *non-local*. A local was defined as a park visitor who resided within 50 kilometers of the park boundary. A non-local was a park visitor who resided greater than 50 kilometers from the park boundary. *Staging areas* in this project were also referred to as *trailheads* and were locations for starting or ending trips into Willmore for park visitors.

This thesis focused on the following five fundamental research questions:

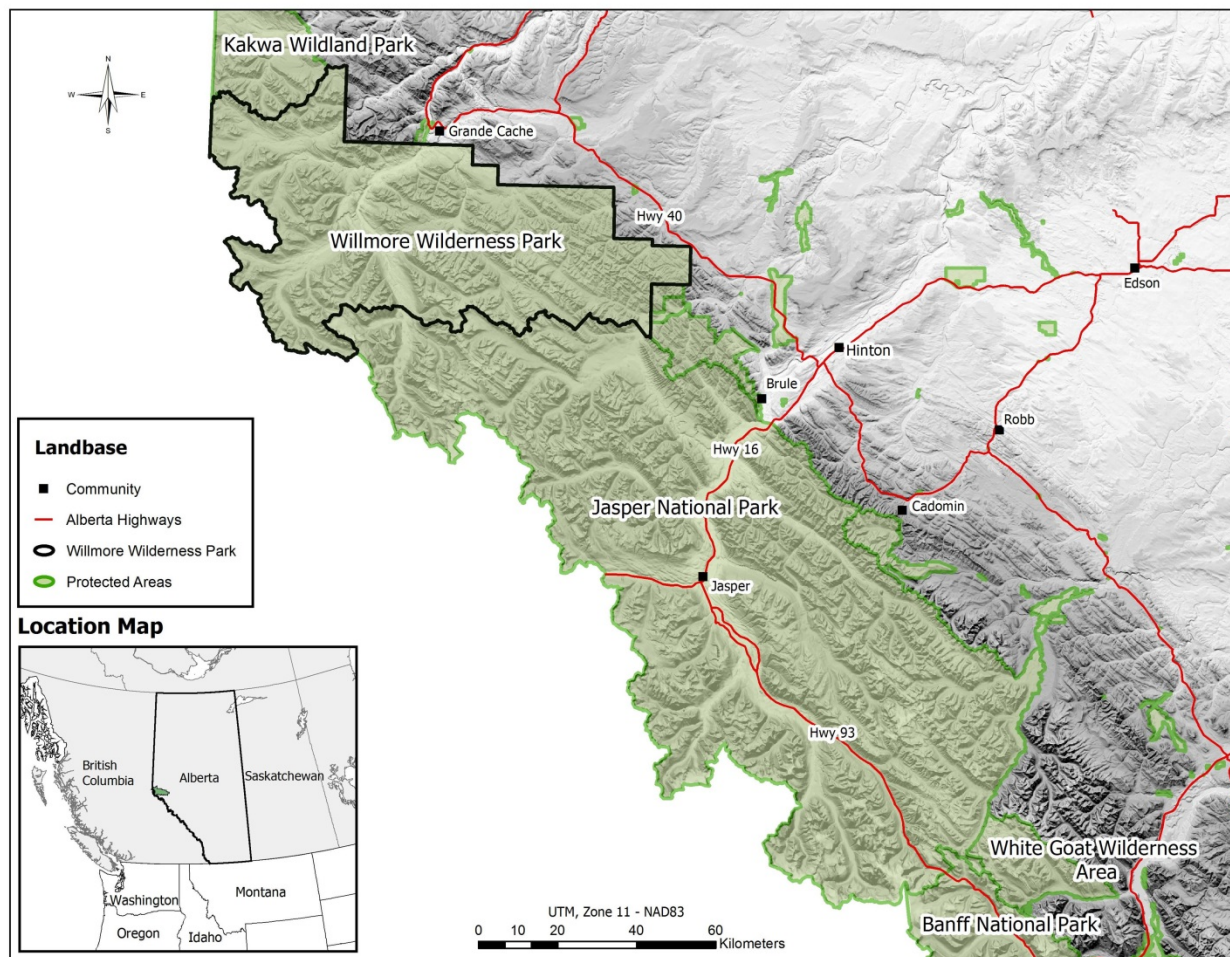
- 1. What is the visitation level of individual staging areas in Willmore Wilderness Park?**
- 2. What are the visitor characteristics, motivations, familiarity (awareness), risk perceptions, and management preferences of Willmore users?**
- 3. What are the spatial patterns of Willmore visitor use?**
- 4. What are the trip characteristics and the main activities of Willmore users?**
- 5. What is the relationship between visitors and the park?**

## **1.3 Study Area**

### **1.3.1 Study Area Description**

Willmore Wilderness Park is located in west-central Alberta, Canada (Figure 1). Willmore Wilderness Park is approximately 4,597 km<sup>2</sup> and is Alberta's largest wilderness provincial park. It was created on April 7, 1959 (officially named in 1965 to honor the late Norman Willmore) and is located in the Rocky Mountains adjacent to the Alberta and British Columbia provincial border. Willmore lies adjacent to the north boundary of Jasper National Park, which is a member of the United Nations Educational, Scientific and Cultural Organization (UNESCO) Canadian Rocky Mountain Parks World Heritage Site. "Willmore Wilderness Park is a significant protected area, of considerable ecological, recreational and cultural value, in Alberta's network of protected areas" (Graham & Quintilio, 2006, p. 5). Willmore provides a rare wilderness within Alberta's rapidly developing industrial landscape (Graham & Quintilio, 2006). The balance between use and preservation is clear in the Willmore Wilderness Act (RSA 1980 cW-10 s3): "The Park is dedicated to the use of the people of Alberta for their benefit, education and enjoyment, subject to this Act and the regulations, and shall, by the management, conservation and protection of its natural resources and by the preservation of its natural beauty, be maintained for the enjoyment of future generations" (Province of Alberta, 2000, p. 2). Willmore is currently managed by the Parks Division, Alberta Tourism, Parks and Recreation (Alberta provincial government) though it has been managed and administered by other government departments and divisions (e.g., Alberta Forest Service). There is no current park management plan for Willmore. A working draft was prepared by the Alberta Forest Service in 1980, but it was not finalized or implemented.





**Figure 1. Study Area Overview**

Willmore is governed under its own legislation - the *Willmore Wilderness Act*. Other than primitive campsites, rugged trails, and patrol or trapper cabins, there are no public roads, services, facilities, or infrastructure within Willmore. The patrol or forestry cabins in the park were originally developed to serve as stopover locations during fire patrols of the park (Alberta Forest Service, 1981). Construction of six additional Alberta Tourism, Parks and Recreation (ATPR) patrol cabins began in late 2010. There are private registered trapper cabins currently in use in the park ranging from simple to well-developed structures. Motorized access (i.e., helicopter, all-terrain vehicles, etc.) is prohibited except for parks personnel, researchers, and registered trappers (during designated seasons). In addition, there are no requirements on where to camp, no strict limitations on trip length (though no permanent habitation is allowed) or group size, and no requirement to pay or register when using the park. Willmore has a variety of



recreational activities including: hiking, horseback riding, and mountain biking. Hunting, trapping (i.e., registered trap lines), and outfitting occur in the park unlike other designated wilderness areas within Alberta where hunting, fishing and trapping are not permitted. In addition, horses are permitted in Willmore. Hunting is a popular activity in Willmore. Some examples of species open to hunting are white-tailed deer, mule deer, moose, elk, mountain goat, black bear, and cougars. The provincial moratorium on the spring grizzly bear hunt began in 2006 (Alberta Environment and Sustainable Resource Development, 2012), however grizzly bears were hunted in Willmore previous to this. Fishing does occur in the park, though it is not a major attraction and the variety and numbers of fish are limited because of the low productivity of mountain water bodies (Alberta Forest Service, 1988). Winter activities include snowshoeing, cross-country skiing, and ski-touring. There are approximately 750 km of trails in the park (McFarlane & Watson, 1998). The origin of many of these trails relate back to fur trade days in the region. Travel in Willmore is rugged and wild; there are no bridged water crossings and trail signage exists only within a few areas of the park (e.g., some signage for trail junctions near the Eagles Nest area). There is minimal trail maintenance in Willmore and much of the past trail maintenance was completed by local user groups or individuals through volunteer efforts (though limited government contracts or funding for trail clearing have been available in the past).

Four main staging areas (i.e., trailheads) provide access to Willmore within Alberta: Big Berland, Cowlick Creek, Rock Lake and Sulphur Gates. Big Berland and Cowlick Creek staging areas are basic and appear to be less well-known and less utilized. Rock Lake and Sulphur Gates are more developed and appear to be more popular with visitors. Rock Lake has a well-established campground and amenities for both hikers and equestrian users (e.g., outhouses, horse corrals, hitching rails etc.). Sulphur Gates has facilities for both day and overnight use. This includes campsites, horse corrals, outhouses, and picnic tables. Other access points to the park include but are not limited to: Victor Lake, À la Pêche Lake, Beaverdam Road, and the North Boundary of Jasper National Park. Willmore is accessible from access points in British Columbia such as Mt. Robson, Holmes River, Chalco River and Cecelia Lake (Alberta Forest Service, 1988). Access through British Columbia may be arduous due to rugged terrain, sparse and overgrown trails, and numerous water crossings. Forest cover and vegetation are dense and thick in certain areas making travel a challenge whether travelling by horse or foot into the west boundary of Willmore.

### 1.3.2 Physical and Ecological Context

The Rocky Mountain Natural Region comprises much of Willmore, although the Foothills Natural Region is present within a portion of the eastern area of the park. In general, the elevations of these regions descend from southwest to northeast (Nelson, 1995). Elevations within the park range from approximately 910 m to just above 3100 m (Nelson, 1995). The highest peak in Willmore is Resthaven Mountain at approximately 3120 m (Canadian Mountain Encyclopedia, n.d.). The majority of Willmore is comprised of the Rocky Mountain Natural region with a small portion of the Foothills Natural Region occurring in the Smokey and Sulphur River watersheds (Negrave, 2005). Upper Foothills, Sub-Alpine, and Alpine Natural Subregions mainly comprise these natural regions. There is a small portion of the Montane Subregion extending along the lower Smoky from Grande Cache (Graham & Quintilio, 2006). The terrain of the park is generally challenging and rugged, with steep mountains and forested valley bottoms. However, gentler ridges and open valleys and basins characterize some parts of the park (e.g., the Eagles Nest area). Important headwaters exist within the park such as the Sulphur, Berland, Wildhay, Jackpine, and Muddywater rivers. A combination of precipitation and heavy spring runoff results in deep and swift rivers in the western area of Willmore (Nelson, 1995). These rivers can be dangerous and difficult to cross. The Continental Divide is located on the southwest boundary of the park.

Willmore is characterized by a short, wet, and cool growing season. This is typical of the Rockies, and winters tend to be long and cold with immense snow accumulation in certain areas (Nelson, 1995; Fisher, Wheatley, & Gould, 2011). Lodgepole pine (*Pinus contorta* Dougl. Ex Loud. var. *latifolia* Engelm.) is dominant on certain ridges in the foothills areas (Hall et al., 2000). Trembling aspen (*Populus tremuloides* Michx.) dispersed with open grasslands occur on certain slope aspects (e.g., Hoff, Berland and Persimmon ranges) (Hall, Walsworth, Gartrell, Wang, & Klita, 2000). North aspect sites with higher moisture contain white spruce (*Picea glauca* (Moench) Voss) (Hall et al., 2000). A higher diversity of deciduous trees is found in the foothills of the park (Hall et al., 2000). Engelmann spruce (*Picea engelmannii*) and subalpine fir (*Abies lasiocarpa*) are found within the subalpine (Fisher et al., 2011).

Willmore is considered to be a benchmark for protected, undeveloped, and intact ecosystems in west-central Alberta (Fisher et al., 2011). Willmore is home to some of Alberta's

rare species including *Sensitive* and *May be at Risk* species such as the wolverine (*Gulo gulo*), and fisher (*Martes pennanti*), and *Threatened* species including Whitebark pine (*Pinus albicaulis*) and the moss Porsild's bryum (*Mielichhoferia macrocarpa*) (Fisher et al., 2011). High profile species such as the grizzly bear (*Ursus arctos horribilis*) and woodland caribou (*Rangifer tarandus*) also inhabit the park. Both of these species have been designated *Threatened* under Alberta's Wildlife Act (Alberta Environment and Sustainable Resource Development, 2012; Alberta Sustainable Resource Development & Alberta Conservation Association, 2010). Other examples of wildlife include black bear (*Ursus americanus*), elk (*Cervus elaphus*), bighorn sheep (*Ovis Canadensis*), wolves (*Canis lupus*), moose (*Alces alces*), coyotes (*Canis latrans*), and a diversity of birds and small mammals. The productivity and variety of fish species within Willmore is limited. Some example species include bull trout (*Salvelinus confluentus*), mountain whitefish (*Prosopium williamsoni*), Arctic grayling (*Thymallus arcticus*), and rainbow trout (*Oncorhynchus mykiss*). Bull trout are classified as a *Species of Special Concern* by Alberta's Endangered Species Conservation Committee (Alberta Environment and Alberta Sustainable Resource Development, 2009).

Both natural and prescribed fire has been mainly suppressed in Willmore. As a result of this along with other potential contributing factors (e.g., fire cycles, etc.), some valley bottoms have dense growths of willow and aspen resulting in reduced wildlife graze and browsing (Edgecombe, 1982). A fire management plan was developed for Willmore in 2006 and is currently being revised. Mountain pine beetle (MPB) infestations have been active in certain areas of Willmore in the past; however, control actions were implemented through fall and burn and pheromone traps (Graham & Quintilio, 2006).

### **1.3.3 Park History**

Willmore has a rich and interesting history much too extensive to describe within the context of this research. Archaeological discoveries have indicated that humans have been occupying the Willmore area for at least 10,000 years (Alberta Wilderness Association, 1973). The history of Willmore encompasses a fascinating myriad of aboriginal traditional users, fur traders, outfitters, trappers, explorers, and adventurers. The fur-trade era left a discernible impact on the subsequent human use and development of Willmore (Alberta Wilderness Association, 1973). Trading activities led to the development of trails which were the basis for the trails that

currently exist in Willmore (Alberta Forest Service, 1981). Grave sites are present in Willmore including the mother of Adam Joachim, the sister of Dolphus Agnes, a baby Delorme girl, Pierre Caraconte, and George Hargreaves (Alberta Wilderness Association, 1973). Other examples of park historic features include trapper, outfitter, and coal exploration cabins, a steam tractor, and historic artifacts.

The signs of past industrial exploration are visible in the park today. Petroleum and coal exploration occurred in the 1960s and scars from the trails and seismic lines are still present on the landscape today (Alberta Forest Service, 1981). Initially, Willmore was classified as a Wilderness Provincial Park and its size has changed over time as a result of the 1959 Wilderness Provincial Park Act (Alberta Forest Service, 1988). This Act permitted the park boundary to be increased or decreased in size. Initially, Willmore was 5,570 km<sup>2</sup> and as a result of two boundary changes (1963 and 1965), it was decreased to its current size (4,597 km<sup>2</sup>) (Alberta Forest Service, 1988).

#### **1.3.4 Management Challenges**

As found with many protected areas around the world, Willmore has park issues and challenges that are intertwined with ecological and human use components. Potential issues and associated descriptions as determined by the researcher are summarized in (Table 1). It should be noted that this list is not exhaustive, but provides a general overview of potential park challenges for Willmore. In many instances management challenges overlap and exist in combinations that are additive as well as cumulative. For example, many of the challenges listed in Table 1 are linked to human use in the park (e.g., stock overgrazing, introduction of non-native plant species, environmental effects at backcountry camps, etc.) and human use surrounding the park (e.g., external development pressures). Management challenges vary in their scale and potential associated impacts, as well as relating to the ongoing balance between human use and conservation goals and objectives. Management challenges range from general to specific and many would potentially link to a future park stewardship plan for Willmore.

**Table 1. Potential Willmore Park Challenges (Ecological and Social)**

<b>Potential Management Challenge (ecological and social)</b>	<b>Description</b>
No management plan	No current management plan for Willmore
Park funding	Adequate funding and staff resources for the protection and stewardship of the Park
Fire (prescribed and wild)	Existing fire management plan for Willmore is being revised
Legal protection status of Willmore	Adequate legal protection of Willmore through the Willmore Wilderness Park Act. Currently, legal enforcement of rules and regulations is difficult through the current Act. The size of Willmore could technically be reduced or decreased
Species of concern (flora and fauna)	Presence of provincially and federally listed species (plant and animal) and several rare species not currently listed. Recovery plans for listed species provide some direction for management but species may have different requirements leading to complex management strategies
Maintenance of healthy ecosystems	Preserving, protecting, and maintaining healthy and functioning terrestrial and aquatic ecosystems into the future
Stock overgrazing	Potential for overgrazing, trampling, and defecation by stock (e.g., horses)
Non-native species	Introduction and spread of non-native plant species (can relate to stock and to a lesser extent, other modes of travel i.e., motorized and foot)
Potential for user conflict	Potential for user crowding and visitor conflict with increased visitation (e.g., competing uses on the same trail or campsite, differing wilderness values, norms, place meanings, etc.)
Inconsistent visitor monitoring	Few past visitor monitoring or social science studies
Trails	Trail maintenance and trail safety. Unmanaged trails may result in adverse environmental impacts. Suitability of existing trails (e.g., ecologically sensitive areas, erosion, wildlife, etc.), and overgrowth of historic trails
Backcountry camps	Firewood management, soil compaction around trees (from stock), trampling, human waste management, and contamination of water sources (possible transmission of disease)
External development pressures	Industrial activity, hydrologic developments, potential recreational commercial proposals, and motorized access (e.g., off-highway vehicles, snowmobiles, etc.) adjacent to Willmore's boundary
Park information	Little information or educational initiatives about Willmore available to visitors and the public (e.g., ecology, history, park safety, wilderness etiquette, rules/regulations, etc.)
Park infrastructure	Park patrol cabins and registered trapper cabins
Relevancy	How relevant is Willmore and wilderness parks to visitors and the general public
Stakeholders	Identification of stakeholders and associated consultation and engagement
Visitor Experience	Maintenance of wilderness experience and values, satisfaction, and place meanings of visitors
Traditional use/historic sites	Inventory and protection of traditional use/historic sites

## **1.4 Overview of Research Methods**

In order to answer the research questions posed in this project, a mixed-methods approach was employed. The mixed-methods approach entailed a combination of data collection instruments including trail cameras (at the four main Alberta staging areas for Willmore), self-administered trail surveys (distributed online, at staging area kiosks, and at surrounding information centres), Global Positioning System (GPS) Tracksticks, in-depth mail questionnaires, and interviews. The population unit of analysis for this study was all visitors using Willmore Wilderness Park for either day or overnight use. During the summer and fall of 2010, park visitors were surveyed through trail surveys and mail questionnaires to determine general demographics and trip characteristics, how they learned about Willmore, what information they used to plan their visit, motivations for their visit, risk perceptions, park management preferences, and their knowledge and awareness of the park. Information about the spatial patterns of visitors was derived from self-administered trail surveys and GPS Tracksticks. Trail camera data provided information about visitor and visit characteristics, domestic animals (e.g., horses and dogs), and wildlife numbers. Interviews helped to provide additional insight into various facets of place meanings and the relationship between visitors and the park.

## **1.5 Study Limitations**

There has been sparse past research pertaining to the human dimension component of provincially designated wilderness parks within Alberta. Much insightful research about wilderness users has resulted from years of past research in the U.S.; however, there is an evident research gap present within Canada. Though there are parallels that can be made to studies in the U.S., the context, visitors, and ecology differ and are unique to provincial Alberta wilderness areas such as Willmore; therefore, the results were not directly transferrable. In the spirit of mixed-methods exploration, this study was undertaken to help fill identified research gaps. Potential study limitations included the following:

- Willmore is a large physical wilderness area with many entry and exit points; therefore not all human use was captured for the park through this study. For example, British Columbia and Kawka Wildland entry points into Willmore were not included.
- Trail cameras were operational for one season (i.e., 2010) and did not include winter and early spring use (i.e., December to May).

- Though comprehensive visit counts of park users were acquired through the trail cameras, the Sulphur Gates camera was missing nearly 19 days of data during August 2010 due to human camera tampering. August was estimated to be a high-use visitation month for Willmore. Results presented from the trail cameras will be lower across all summary results due to the missing data.
- Trail surveys did not capture a representative sample of all Willmore users. Commercial users were difficult to define, their participation was difficult to obtain, and therefore information about commercial operators and their clients was under-represented.
- A small sample size for the in-depth survey was obtained which limited subsequent statistical analysis possibilities.

Given these limitations, this research provided innovative and effective research methods to aid in the understanding of wilderness, natural, and protected area visitors not only within Alberta, but around the world.

## **1.6 Organization of this Thesis Document**

This thesis is organized into five chapters. Chapter one presents the project background and rationale, research purpose and questions, the study area, and a brief overview of research methods. Chapter two provides a summary of relevant literature related to the topics of monitoring visitor use, visitor motivations and Recreation Experience Preference (REP) scales, visitor knowledge and awareness, place attachment, and place meanings. Chapter three details the methods used to collect, manage, and analyze the data. Chapter four describes the results derived from data analysis and weaves in a discussion of the derived results. Chapter five concludes with a research question summary, research implications, methodological and key management recommendations, personal observations, suggested future research directions, and concluding thoughts.

## 2.0 LITERATURE REVIEW

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Photo Credit: Matthew Wheatley, Alberta Tourism, Parks and Recreation

***“You cannot guard wilderness by modernization. You have to guard it by wilderness itself” - Corey***



## 2.1 Monitoring Visitor Use and Patterns

Often, the management of a park or protected area involves more than just the management of ecological components. Managing the “people” component is critical in ultimately achieving conservation-based targets and objectives. Payne and Graham (1993) identified three forms of challenges associated with visitor use within parks and protected areas: (1) increasing numbers of visitors which in turn produce management problems i.e., long-term damage to the natural environment, (2) encounters between wildlife and humans, and (3) conflicts between individuals and groups of visitors. However, adverse impacts on the natural environment do not result from park visitation alone. Other factors such as the amount of park utilization, the flows and distribution of people and activities within a region, seasonal use, and the particular leisure activity itself, also contribute to the impact (Ziener, 2002 as cited in Arrowsmith, Zanon, & Chhetri, 2005). In order to manage visitor use, “an understanding of the amount, character, and distribution of recreational use is essential to wilderness management because such use is the cause of many impacts, the source of many wilderness values and potential funding” (Dawson & Hendee, 2009, p. 369). An in-depth understanding of visitor use levels and patterns contribute to the understanding of many important issues in protected areas management related to visitor experience and resource protection priorities (D’Antonio, Monz, Newman, Lawson, & Taff, 2012). Gathering visitor information is critical for managing human use to ensure “quality recreation experiences, sustainable use of the area (e.g., knowing and managing impacts on terrain, wildlife etc.), promotion of public health and well-being, tourism planning, efficient protection of nature and cultural heritage, and sufficient financing (Kajala et al., 2007, p. 20).

However, monitoring visitors within certain outdoor physical contexts such as wilderness settings can be a challenge. The sampling of wilderness users is difficult because wilderness use is relatively light, highly variable spatially and temporally, and users are often located in hard-to-reach places (Lucas & Oltman, 1971). Wilderness is often a complex open system with many entrance and exit points and an attempt to monitor the entire boundary of an area would be costly and difficult. However, visitors tend to keep to the trails especially in more remote areas where they tend to utilize main entry points the area (Kajala et al., 2007). Knowledge of the main access points and more commonly used travel corridors for an area can provide a selection of data collection locations that together provide an acceptable level of representativeness (Kajala et

al., 2007). A variety of methods can be used at access points to obtain visitor data. These methods include both direct and indirect methods of counting to estimate visitor use. Some examples include the following: observations, electric counters, automatic cameras, trail registration or survey stations, mandatory permits, remote sensing, and guessing (Hendee & Dawson, 2002). Depending on the method chosen, each option exhibits associated strengths and weaknesses.

Improvements in GPS technology has resulted in a wide selection of devices at varying prices that can be utilized for visitor monitoring. These devices along with the incorporation of GPS into smartphones, laptops, and automobiles, provide opportunities and options for the collection of spatial and temporal data from park visitors (Hallo et al., 2012). Locations from tracking devices can help inform park management through the ability to examine spatial patterns of visitor use (D'Antonio et al., 2010). GPS devices collect a log of the spatial locations where visitors have travelled along with other attributes (e.g., speed and time). GPS is possible because of the GPS satellite constellation that orbits the earth. GPS signals can be affected by the availability of satellites and by the terrain of the area that they are utilized within. Weather generally does not affect GPS signals.

### **2.1.1 Direct Counting Methods for Visitor Monitoring**

There are generally four methods of direct counting that are used to help estimate use and monitor visitor use patterns (Hendee & Dawson, 2002). These four methods include: direct observation, field interviews, voluntary self-registration, and mandatory permits (Hendee & Dawson, 2002). Direct observation is where a human observer systematically observes or interviews visitors. Field interviews occur when the researcher interviews a visitor to obtain visitor use information and visitor characteristics. Voluntary self-registration entails the visitor completing a survey card or questionnaire before entering an area, and use characteristics are obtained from analyzing the information from the card (Watson et al., 2000). Mandatory permits are similar to voluntary self-registration cards, with the exception that they are not optional to fill out and are required to be completed by the visitor prior to entering and using an area.

### **2.1.2 Indirect Counting Methods for Visitor Monitoring**

Indirect counting methods for estimating visitor use and monitoring use patterns include automatic photography and electronic trail or traffic counters (Hendee & Dawson, 2002).

Automatic photography can entail using a camera or video camera that is installed at a particular trail location. When the camera is triggered by the motion of a person or animal, it captures an image along with attributes such as air temperature, date, and time. Video cameras can capture single images at fixed intervals or record video. The object that triggered the camera can be determined from the image, as well as direction of travel, activity type and group size. Trail or traffic counters are available in many different options and may include infrared systems, seismic systems, or passive infra-red systems (Hendee & Dawson, 2002). Trail and traffic counters can only supply a count, date, and time and cannot discern what triggered the device (i.e., a person or animal or what direction the object is travelling).

### **2.1.3 Mixed-Methods for Visitor Monitoring**

A review of the literature revealed that a majority of the research used a mixed-methods approach for monitoring visitors. Example methods included the following: surveys, airplane flights, video monitoring, visual counts, interviews, trail/traffic counters, which were in some cases coupled with a geographic information system (GIS) and GPS. The mixed-method approach combines a variety of techniques in order to balance out the strengths and weaknesses of each specific technique compared to being utilized alone. For example, the use of GPS in tracking visitors has been found to offer a much higher resolution of spatial and temporal data collection than traditional methods where trip route information was self-reported (e.g., trail surveys, questionnaires, trip diaries etc.) (Hallo et al., 2012; Taczanowska, Muhar, & Brandenburg, 2008). Often, these traditional methods for visitor monitoring were prone to error, exhibit imprecision, and can be burdensome to all involved (Hallo et al., 2012). GPS technology can be used to complement existing methods to help provide more accurate data while being fairly unobtrusive and inexpensive (Orellana, Bregt, Ligtenberg, & Wachowicz, 2012). GPS and GIS are complimentary and GIS can be used to further analyze GPS information and combine it with other layers and information making the two a powerful combination. In summary, the combination of methods utilized depends on the study goals, research questions, objectives, study area, and resource availability including budget and personnel.

In the Danube Floodplains National Park in Austria, a combination of techniques was used to monitor visitor recreational use. Long-term video monitoring, counts by human observers, visitor interviews, and route analysis with GIS were utilized to analyze visitor use patterns and visitor behavior within the park (Arnberger & Brandenburg, 2005; Arnberger & Hinterberger, 2003). Objectives of these studies were to determine total numbers of visits, seasonal variations in visitation rates, spatial-temporal distribution of various users groups, and the occurrence of visitors with dogs. Through this combination, additional information was calculated and produced, such as the spatial distribution and loading of visitor use, length of routes, route analysis, influence of weather, and the plotting of maps. Limiting factors in relation to the equipment were also revealed. For example, Arnberger and Brandenburg (2005) found that the limitations of video monitoring included cost, power supply, ethical aspects, and data management. In a related study, Arnberger, Haider, and Brandenburg, (2005) focused on comparing and evaluating video monitoring and counts by human observers with regards to their reliability on estimating group sizes as well as identifying user types (e.g., walkers, joggers, etc.). This study also occurred within the Danube Floodplains National Park. Total and hourly visitation rates were compared to detect bias, the mean hourly sums by user type were compared, and differences in estimates of group sizes were examined between the two monitoring methods (Arnberger et al., 2005). The results revealed several statistically significant differences between the two monitoring methods. These differences varied by user types and were also influenced by use levels and group size (Arnberger et al., 2005). For example, during low-use periods quicker recreational activities (e.g., bicycles and joggers) were captured less accurately with video monitoring. During higher-use periods, slower activities such as walking were under-reported by human observers.

Shoji, Yamaguchi, and Yamaki (2008) utilized self-registration books and infrared trail counters to estimate visitor flows in Daisetsuzan National Park in Japan. Challenges were encountered because the number of visitors that did not register was unknown. To help address this challenge, visitor flows were estimated for each trail section using self-registration book data for selected routes. Biases, underestimations, and errors were prevalent in the study; however, it provided a base for future studies to grown upon and be explored.

There were few studies that utilized GPS within complex *open systems* with areas of rugged or mountainous terrain. An open system is an area that has several entry and exit points (Hallo et al., 2012, p. 2). Often GPS studies have been limited to simple and closed systems, short durations, or settings atypical of many natural areas or national parks (Hallo et. al., 2012). Simic (2008) utilized trail counters, trail cameras, GPS Tracksticks, and trail intercept surveys to help monitor the effectiveness of a bear-related group access policy in the Moraine Lake area of Banff National Park, Alberta. The objectives of this study were to profile area visitors, obtain a better understanding of visitor experience, determine levels of human use, compare visitor compliance rates to previous years, determine visitors' bear awareness levels and familiarity with the bear group access policy, and to determine visitors' support for various management approaches in the area (Simic, 2008). This was one of the few published studies that utilized a GPS Trackstick as a study instrument in addition to trail cameras, counters, and surveys. GPS Tracksticks were handed out to visitors willing to participate in the study to find out where park visitors travelled and to identify high use areas (Simic, 2008). The Trackstick made it possible to plot the resultant GPS tracks over a topographic map of the area to discern concentrations of trip routes and high use areas.

D'Antonio et al. (2012) distributed Garmin GPS 60 units to trail users within three different study areas (Tuolumne Meadows, Yosemite National Park, California; Bear Lake Corridor, Rocky Mountain National Park, Colorado; and the Teton Range, Wyoming) to examine spatial patterns of visitor use. In Yosemite, GPS tracking along with infrared trail counters were utilized, in Rocky Mountain National Park GPS tracking along with an optional survey, and in the Teton Ranges, trail counter and GPS-tracking data was collected during the winter season. Overall, the topography of sites did not appear to significantly affect signal reception and it was found that the use of GPS in visitor monitoring held significant promise. The use of GPS technology allowed the collection of finely detailed visitor use data and was shown to be a more powerful and practical method when compared to traditional methods (e.g., observational or survey techniques) (D'Antonio et al., 2012). Limitations or challenges of GPS technology appeared to be the following: retrieval of the GPS unit post-trip, battery life, data storage (of this particular unit), positional error, satellite reception, data processing and analysis, along with and the requirement of being knowledgeable in the software used to analyze the data (e.g., ESRI ArcGIS software).

Other GPS related devices utilized to track visitor movement within the literature included a GPS Global System for Mobile communication (GSM) device (Nielsen, Harder, Tradisauskas, & Blichfeldt, *n.d.*), mobile phones enabled with GPS (McKercher & Lau, 2009), and a personal data assistant (PDA) equipped with GIS and GPS (Lai, Li, Chan, & Kwong, 2007). Overall, a mixed-methods approach that utilizes standalone GPS units or tracking devices appear to have the most potential for visitor monitoring in parks or protected areas due to the relatively low price of units, durability, user acceptance, and ease of use. In some areas there may be sparse or no cell tower coverage, so standalone GPS devices are more suitable. GPS and associated technologies are continually evolving and new and emerging devices and units are being released on a frequent basis.

## **2.2 Past Visitor Studies Within the Study Area**

To date, visitor studies for Willmore have been sparse. The collection of visitor information has been a challenge due to many reasons. Willmore is a large and remote wilderness area and it is characteristically difficult to study park visitors in large physical wilderness areas. As mentioned, wilderness use is relatively light, variable, and often occurs in low densities making it cost-prohibitive to monitor all wilderness entry and exit locations (Dawson & Hendee, 2009). In general, visitor monitoring can be expensive and time consuming, and in the face of limited budgets and resources it often gets overlooked. Visitors to Willmore are not required to register or complete a permit to use the park, so visitor studies must rely on other methods to gather visitor information such as self-administered trail surveys. Past studies have included voluntary self-registration (e.g., O'Brien, 1982; McFarlane & Watson, 1998, 1999), staff observation and surveys (e.g., backcountry patrols and backcountry guardians), surveys distributed at visitor information centres (e.g., Alberta Tourism, Parks and Recreation, 2009), and information from commercial trail rider (CTR) reports and permit applications. Voluntary self-registration studies collected both visitor (e.g., origin, total number of previous visits etc.) and trip (e.g., trip type, trip length, entry point) information. The duration that registration stations were operational varied, but were mainly operational during the summer and fall. It appeared that none of the studies collected winter or early spring use (i.e., January to April). Information pertaining to detailed demographics and visitor information (e.g., age, gender, management preferences, etc.) were not collected, nor were the registration rates of most studies calculated. Observable attributes were collected through staff observation (e.g., group

size, number of horses, etc.) and surveys pertained to agency staff posing questions to visitors about themselves, their group and their trip. Information collected from staff observation was limited and only collected the observable (i.e., group size and not attributes such as visitor origin) while in-person staff surveys (e.g., park patrols), appeared inconsistent in the data gathered and questions posed. In some instances, few or no people were encountered during patrols or fieldwork (Alberta Sustainable Resource Development, Range Management Branch, 2001). Information from CTR reports and permit applications appeared to be inconsistently gathered post-season (i.e., not collected). Temporal trip information did not appear to be collected or analyzed in past studies (e.g., time of day, day of week, etc.).

## **2.3 Recreation Motivations and Preferences**

Why do caving enthusiasts enjoy being surrounded by complete darkness with only the light of their headlamps to guide their path? Why do climbers endure freezing cold temperatures while balancing on a tight ledge in their bivy sacks? Recreation and leisure studies have long recognized the importance of motivations and preferences in helping to demystify the reasons why people choose to recreate in certain activities and within certain environments. Much of the early research in motivations and preferences focused on activity and setting preferences. More recently, the focus has been on experience preferences in conjunction with different dimensions of the recreation setting such as visitor preferences related to the physical environment, social conditions and management actions (Davenport, Borrie, Freimund, & Manning, 2002). “Visitor preference information has guided decision-making related to the physical, social, and managerial settings of protected places” (McLaughlin & Paradice, 1980 as cited in Davenport et al., 2002, p. 52). In the past, especially within the U.S., there has been wide empirical research into the motivations (desired psychological outcomes) of recreationalists through REP scales.

### **2.3.1 Recreation Experience Preference Scales**

As a result of his perceived frustration at a lack of tools suitable for testing the belief that leisure was beneficial, especially in natural environments, B.L. Driver focused on looking at the motivational bases of leisure choices (Driver, Brown, & Peterson, 1991). Driver’s work was “based on the concept that recreation is more than participation in an activity, and should be viewed as an experience providing various rewards or outcomes to participants” (Driver & Brown, 1975 as cited in Graefe, Thapa, Confer, & Absher, 2000, p. 107). From the resultant

efforts of Driver and his colleagues, REP scales were created. The development of REP scales was a two-phased approach and included the following: (1) focusing primarily on identifying scales that would comprehensively measure the concepts of interest, and (2) establishing scale reliability and testing the validity of the scales for use in measuring the desired experiences of recreationists (Manfredo, Driver, & Tarrant, 1996). REP scales were based upon the unmet needs hypothesis that leisure is beneficial in helping people gratify needs not satisfied by their non-leisure activities (Skår, Odden, & Vistad, 2008). More directly, the work of Driver and his colleagues was based on the social psychology expectancy theory. That is, people select and participate in recreation activities to meet certain goals or satisfy certain needs (Manning, 1999). Many studies have utilized REP scales, but typically, these have focused on domains hypothesized to be important for the particular activity or setting in question (Graefe et. al., 2000). In 2004, Hammit summarized the mean scores and rank order of uses of 15 different areas from low-use designated wilderness to highly used outdoor areas. For both the designated and undesignated wilderness, the top five domains were: “enjoy nature,” “physical fitness,” “reduce tensions,” “escape noise or crowds,” and “outdoor learning.” In a more recent summary, Cordell, Bergstrom, and Bowker (2005) presented a summary of the most popular benefits from eight studies conducted between 1977 and 1987 in designated wilderness areas. “Enjoy nature,” “physical fitness,” “reduce tensions,” “escape,” and “learning” were again the dominant five most valued domains.

Outdoor recreation managers have used REP scales to study a variety of users within an array of settings. The REP scales to measure recreationists’ motivations were developed by means of survey questionnaires and interviews of individuals engaged in many activities and environments (Hammit, 2004). The main motivations for participating in the activity or visit were rated by the participant on a five point Likert scale (ranging from *not at all important* to *extremely important*). Some examples of activities that were examined in the literature included: anglers (Wilde, Riechers, & Ditton, 1998), other water-based recreationists including kayakers, river rafters, canoeists, (Schuett, 1994; Stein, Denny, & Pennisi, 2003; Thapa, Confer, & Mendelsohn, 2004), climbers (Ewert 1993; McIntyre, 1992), mountain bikers (Skår et al., 2008; Vilter, Blahna, & Van Patten, 1995), snowmobilers (Davenport et al., 2000; May, Bastian, Taylor, & Whipple, 2001), hikers and horseback riders (Dear, McCool, & Borrie, 2005), various forest users (Graefe et al., 2000), scuba divers (Meyer, Thapa, & Pennington-Gray, 2003) and



various urban park users such as walkers, runners, in-line skaters, and bicyclists (Lee, Scott, & Moore, 2002).

### **2.3.2 REP Scales and Motivational Differences of Participants Between and Within Activities**

Past research has shown that motivations differ for participants between different activities. In a study of water-based recreationists on the Gallatin River, Montana, U.S. (Thapa et al., 2004) found that there was a difference in motivations between rafters, anglers, and kayakers. Rafters were more likely to participate to view wildlife and to tell others about it at home; anglers were more likely to participate for solitude, and kayakers were more likely to participate because of the challenge, stay in shape, and to do things with other people (Thapa et al., 2004). Dear et al. (2005) found visitors to the Bob Marshall Wilderness Area rated “to observe scenic beauty,” “to take in some natural surroundings,” and “to have fun,” as the three most important motivations for their visit. However, after analyzing the differences in motivation by mode of travel, it was found that hikers were more likely than horseback riders to be motivated by the ability “to take in natural surroundings” and “to enjoy the smells of nature.” and by the ability “to observe scenic beauty” (Dear et al., 2005). Grafe et al. (2000) studied wilderness, scenic area, campground, horse, and landowner user groups within the Allegheny National Forest and found that adjacent landowners and wilderness users stood out from other user groups. The wilderness users were motivated by escape, nature, and challenge, whereas the adjacent landowners placed a greater motivational value on finding places for outdoor recreation close to home (Grafe et al., 2000). Scenic area users were motivated by learning about the area, and were less interested in escape as a motivational item (Grafe et al., 2000). Campers were found to be more interested in escape.

Past research has also revealed that motivations also differ for individuals within an activity. After studying mountain bikers in Norway, Skår et al. (2008) found that motivations between competitive riders and riders that were in a more tour-oriented environment showed close similarities and some differences. When these two sub-samples of rider types were merged together, physical exercise, contemplation, and nature experience were the three most important motivational factors. This study also compared the modern motivations of mountain biking to

motivations of more traditional outdoor activities and found that mountain bikers held the traditional value of appreciating nature.

## **2.4 Perceptions, Attitudes, and Management Preferences**

Visitor perceptions, preferences, and attitudes are important concepts to understand across many facets of park management. Visitors are central stakeholders of national parks and other reserves (Müller & Job, 2009). Therefore, it is important for park managers to understand “what visitors perceive how they judge impacts, and what effect, if any, their perceptions have on visitors’ overall experience which can help shed insight into management decisions related to visitor experience” (D’Antonio et al., 2012, p. 542). A thorough understanding of the preferences and attitudes of visitors is crucial in the formulation of management plans (Warzecha, Lime, & Thompson, 2000). It is also important for managers not to base their understanding of visitors on assumptions or self-assumed knowledge. Visitor-management techniques are often implemented, but they are based on the preferences and management expertise of managers rather than on the actual preferences of the visitors themselves (Schneider, LaPointe, & Stievater, 2000).

“Managing for ecological integrity and conservation of biodiversity in protected areas requires an understanding of the human dimension (e.g., attitudes and preferences) as well as the ecological” (McFarlane et al., 2006, p. 341). Learning about the perceptions that visitors share with relation to planned or proposed management actions and an understanding of why visitors have certain perceptions are required for effective park management (Davenport et al., 2002). In general, attitudes and preferences of visitors was an early focus of outdoor recreation based on the acknowledgement of recreation as a social behavior (Manning, 1999). Additional research was generated by the idea that managers and the public often have varying attitudes and perceptions and that it was important to gain an understanding of these differences.

Many of the concepts surrounding the perceptions, preferences and attitudes of visitors are inter-related and exhibit many definitions and terminology depending on the context of the literature. Tuan (1974) defined attitude as being “a cultural stance, a position one takes vis-à-vis the world” and that attitude exhibits more “stability than perceptions and is formed of a long succession of perceptions” (i.e., through experience) (p. 4). An attitude is defined as “a person’s enduring evaluation of some object, person, action, or concept (attitudinal target) that pre-disposes the person to respond cognitively, emotionally, and behaviorally in particular ways

towards (or away from) the attitudinal target” (Jenkins & Pigram, 2003, p. 22). An individual’s tendency to consistently respond favorably or unfavorably to the attitudinal target is represented by attitudes (Vaske & Donnelly, 1999). It is common to measure attitudes through people indicating their evaluation of the attitudinal target for example using a scale (e.g., *strongly agree* versus *strongly disagree*) with the individual indicating the extent which they evaluate the attitudinal target (i.e., object) (Jenkins & Pigram, 2003). Attitudes are usually based on beliefs about the object (Williams, 2008). So for example, an individual may hold an attitude about national parks and may believe for example that forest logging should not be allowed within a national park.

Studies of preferences have been a foundation of recreation and leisure research with early studies focusing on activity and setting preferences (Davenport et al., 2002). As discussed in the preceding section, a common method to measure preference is through REP scales. An alternative approach to understanding park visitors is to gain an understanding of management preferences. This relates back to attitudes where they may be influenced by a variety of factors such as environmental worldview, knowledge, and salience of an issue, as well as sociocultural influences (McFarlane, Stumpf-Allen, & Watson, 2006). Peoples’ attitudes towards management issues or challenges influence their judgement of acceptable management and policy options (McFarlane et al., 2006). For example, wilderness users that had a positive attitude towards management policies of the park also were supportive of proposed use restrictions in Mount McKinley National Park, Alaska (Bultena, Albrecht, & Womble, 1981).

Perception ties closely to preference and both affect outdoor experiences in many ways (Dorwart, Moore, & Leung, 2010). Perception was defined by Tuan (1974) as “both the response of the senses to external stimuli and purposeful activity in which certain phenomena are clearly registered while others recede in the shade or are blocked out” (Tuan, 1974, p. 4). More recently, Jenkins and Pigram (2003) described environmental perception as referring “to the process whereby humans organize and interpret elements of their environment into a meaningful picture of their world or life-space” (p. 359). They also argued that “environmental perception is basic to an understanding of leisure behavior and recreation decision-making, and why people select particular settings and activities” (Jenkins & Pigram, 2003, p. 359).

Inter-woven into the above concepts are knowledge, awareness or familiarity which will be discussed in the next section of the literature review.

## **2.5 Knowledge, Awareness, or Familiarity**

Past research pertaining to visitor knowledge, familiarity, and awareness has mainly focused on national parks, wilderness and protected areas, or national forests (e.g., D'Antonio et al., 2012; Maw, 1989; McFarlane et al., 2006; Smaldone, Harris, Sanyal, & Lind, 2005). Other studies have examined general populations about ecological or biological topics (e.g., Ericsson and Heberlein, 2003; MacFarlane, 2005). Research pertaining to visitor knowledge, familiarity, or awareness has most commonly been utilized as a component or an aspect of the research. Much of the reviewed literature combined aspects of knowledge, awareness or familiarity with such concepts as: place attachment (Smaldone et al., 2005), perceptions (Petrosillo, Zurlini, Corliano, Zaccarelli, & Dadamo, 2007), preferences (Cole & Hall, 2008), and attitudes (Müller & Job, 2009) or with combinations of these concepts (e.g., attitudes and perceptions) (Maw, 1989). Many of these studies examined knowledge across one or more visitor characteristic(s). Some examples of visitor characteristics examined in the literature included but were not limited to: frequency of visits, travel distance, conservation organization membership, and presence of on-site interpretive signage (Booth, Gaston, & Armsworth, 2009) level of education, gender, and place of residence (Petrosillo et al., 2007). Approaches that seek to measure knowledge can be classified as either being objective or subjective. An objective assessment simply has a right or wrong answer (e.g., true or false; yes or no; multiple choice answers). A subjective measure can be for example a self-rated response to a knowledge gauging question (e.g., are you aware the site you are visiting is a protected wilderness area?). Another variation of a subjective self-assessment is where the respondent self-assesses their knowledge on a Likert scale (e.g., 1 = *never heard of something* ranging to 4 = *very knowledgeable about something*). For example, the participant could be gauged if they are knowledgeable about grizzly bears and they would indicate the number corresponding to their self-assessment of their knowledge level. Examples of subjective and objective formats for gauging knowledge were found throughout the literature.

For the purpose of this literature review, knowledge, awareness, and familiarity were considered as one related concept. Through the literature reviewed, three main themes of visitor knowledge emerged with relation to national parks, wilderness and protected areas, or national

forests: (1) rules, regulations, or policy and appropriate practices, (2) general area knowledge or awareness, and (3) specific ecological knowledge or awareness. The third theme also included a sub-category of public ecological knowledge. Some studies contained a combination of themes and will be discussed in more than one theme. It should be noted that much of the literature reviewed had broader goals, objectives, and hypotheses that focused on very specific concepts and components related to attitudes and perceptions. This literature review focused on the knowledge and awareness components of these studies. The following section summarizes the literature reviewed within these three theme areas of knowledge and awareness.

### **2.5.1 Rules, Regulations, or Policy and Appropriate Practices**

This first theme of knowledge encompassed literature that contained aspects of visitor knowledge or awareness of appropriate practices (e.g., leave no trace), and rules, regulations, or policy. Hockett and Hall (2000) determined through research interviews that few visitors to Shenandoah National Park, U.S. were aware of what federally designated wilderness was and where it was located. This prompted a subsequent survey study, where a self-assessment question gauged if park visitors knew what federally classed wilderness was along with questions gauging opinions about wilderness management. Surveys were mailed to backcountry users. Over 90% of the respondents believed they knew *only a little* or *no knowledge* about what legally classified wilderness was. It was determined through self-measured knowledge levels that those who claimed a higher level of wilderness knowledge held a more “purist” view of wilderness management.

In a more recent research paper, Cole and Hall (2008) included one self-measure question related to visitor knowledge of the Wilderness Act. This study investigated experiences and management preferences of visitors to low use and higher use wilderness locations administered by the Forest Service in Oregon and Washington, United States. On-site questionnaires were utilized within 13 wilderness areas and mail-back surveys were issued to self-issue permit holders (Cole & Hall, 2008). Most users felt they *knew a bit* about what legal wilderness was. Permit holders exhibited a much higher self-reported knowledge level than that of the average visitor (Cole & Hall, 2008). There were small differences found between visitors’ knowledge levels at the higher use trailheads versus the lower use trailheads. Visitors to more heavily used trailheads were less knowledgeable than visitors to low use trailheads. When knowledge levels of

day and overnight visitors were compared, day users were a little less knowledgeable than overnight users (Cole & Hall, 2008).

Other studies within this theme focused on exploring visitors' knowledge of appropriate practices (e.g., minimum impact practices) or activities. Minimum impact practices are typically public messaging that focusses on sustainable backcountry and wilderness etiquette, behavior, and practices. Newman, Manning, Bacon, Grafe, and Kyle (2003) surveyed Appalachian Trail hikers through an on-site or mail questionnaire to explore their knowledge of minimum impact practices. Knowledge levels were tested through a collection of true or false quiz type questions. Results were summarized for various hiker types (e.g., day and overnight etc.). Visitor, trip, and trail characteristics were also gathered (e.g., trip type, gender, trail section etc.). Results revealed that hikers on this trail had a good understanding of minimum impact practices (overall mean score of 82% for ten questions ranging from a low of 0% to a high of 100%). D'Antonio et al. (2012) also measured visitor knowledge of minimum impact practices (i.e., Leave No Trace) but through a multiple choice question format. Visitors were found to be knowledgeable about appropriate backcountry practices in the Bear Lake Corridor of Rocky Mountain National Park, U.S. For both studies, understanding the knowledge levels of visitors was important for not only identifying future areas of research but more specifically, designing and developing communications, extension and outreach information, messaging, and tools to address knowledge gaps or areas of importance. For example, Confer, Mowen, Graefe and Absher (2000) suggested targeting the visitor segments that exhibited low knowledge levels for communications and outreach initiatives.

Fly, Jones, and Cordell (2000) through telephone interviews examined the publics' attitude towards and knowledge of wilderness in the Southern Appalachian ecoregion, U.S. They gauged participant knowledge through true and false questions about park ecology but the results were not presented in their paper. However, results from questions relating to wilderness were discussed. In particular, the questions asked if timber harvesting and motor vehicles were permitted in wilderness areas of federal jurisdiction in the Southern Appalachia. It was found that the publics' knowledge of allowable activities was limited. Less than 20% of respondents correctly answered that both activities were not permissible within Southern Appalachia designated wilderness.

Focusing on coral reef ecosystems located within an Egyptian National Park and a popular tourist beach resort, visitor perceptions were investigated along with knowledge of coral reef ecology and national park regulations. Knowledge determination was self-assessed through self-administered questionnaires. Across the study sites, close to 68% of respondents indicated they were familiar with park regulations. It appeared most respondents were aware of permissible activities with the exception of fish feeding, shell collecting, and trampling corals (which were all not allowed). When knowledge levels were contrasted with nationality, there was considerable variation between awareness of national park rules and appropriate activities (Leujak & Ormond, 2007).

### **2.5.2 Knowledge Pertaining to General Understanding**

The next literature theme contained knowledge pertaining to the general understanding of the park visitor about the area they were visiting. In a study focusing on the National Park of Eastern Macedonia and Thrace in north-eastern Greece, learning about local visitors' park knowledge was a component of a larger study. This study aimed to investigate the perceptions and preferences of people living in close proximity to the park and involve local citizens in decision-making related to the park (Pavlikakis & Tsihrintzis, 2006). Survey participants were asked to self-assess their knowledge of the park area by answering yes or no. For participants that indicated yes (they had knowledge of the park), they selected from a set of answers of how they knew about the park. Results indicated that close to 63% of respondents self-assessed themselves to be knowledgeable about the park. This was mainly through living (32.5%) or having a seasonal home (37.8%) in the park (Pavlikakis & Tsihrintzis, 2006).

Booth et al. (2009) administered on-site questionnaires to users of Sites of Special Scientific Interest (SSSI) in Yorkshire and Humberside, England. The objective of the study was to provide a benchmark measurement of what people understood about the protected areas they were visiting (i.e., was the visitor aware of the protected area status of the site?). Resultant levels of understanding could serve as an indicator to assess the success of educational and other efforts used to improve visitor knowledge and understanding. It was found that visitors knew relatively little about the SSSI status of the site they were visiting. Only 32% of visitors were aware that the site was a SSSI (Booth et al., 2009).

In a marine protected area (MPA) in Italy, Petrosillo et al. (2007) gauged users through an in-person questionnaire to learn about tourist perceptions of the area. A component of the study was to determine if visitors were aware of being in a marine protected area (through indicating yes or no). Resultant awareness was contrasted with demographic characteristics (e.g., gender). A large proportion (89.5%) of participants were aware they were within an MPA. Level of education and place of residence were also found to influence their awareness of being in an MPA. Interestingly, there were more unaware tourists from surrounding park communities and more aware tourists from other Italian provinces. There have been similar and contrasting findings as to knowledge level difference between local and non-local visitors. Papageorgiou (2001) compared responses from knowledge questions by local and non-local park visitors in a Grecian National Park. He found that similar knowledge levels were exhibited for both locals and non-locals related to general park knowledge. Both were found to have poor knowledge of park regulations (with locals being slightly more knowledgeable). Papageorgiou (2001) found educational level to be an important determinant of knowledge in Vikos-Aoos National Park only for non-local visitors. Pavlikakis and Tshirintzis (2006) found over 70% of respondents who were knowledgeable about the National Park of Eastern Macedonia and Thrace, Greece were either permanent or seasonal residents.

It is possible that the differences in findings may be attributed to sample types, sizes, and demographics along with the types, format, and number of questions pertaining to gauging knowledge levels for example.

### **2.5.3 Ecological Knowledge**

This theme encompassed literature that gauged visitors' knowledge in relation to biodiversity, flora, fauna, natural history or ecology.

#### **2.5.3.1 Natural Disturbance**

According to Flint, McFarlane and Müller (2008) there has been little research that has encompassed the human dimensions of insect-caused forest disturbance. Gaining an understanding into the perceptions, experiences and actions of people and communities is essential to managing rapidly changing forest ecosystems (Flint et al., 2008). Insect disturbance such as MPB infestation and resultant salvage operations likely influence all identifiable processes (e.g., hydrology, climate change, etc.) within individual stands and over larger areas



(Bunnell, Kremsater, & Houde, 2011). All major habitat attributes will be affected and therefore resident wildlife will also be influenced (Bunnell et al., 2011). Furthermore, other ecosystem components or values such as flora, fauna, and people will be influenced in both negative and positive aspects. Within protected areas MPB may impact recreational experiences. For example, altered aesthetics, the loss of tourism revenue from the area, or trail closures due to the danger of falling or fallen trees may result (Flint et al., 2008).

McFarlane et al. (2006) incorporated knowledge as a component of their study. This study examined the perceptions and attitudes toward mountain pine beetle. Residents living in or around in Kootenay and Banff National Parks (local residents) in Canada were gauged through a mail survey. Respondent knowledge of pine beetle was obtained through subjective self-rating on a four-point scale from having *never heard of it* to *knowing much about it*. An objective knowledge indicator was calculated from the results of 14 true or false or not sure statements. These statements were presented to respondents (who at a minimum indicated they at least had some knowledge about mountain pine beetle). Environmental worldview, attitudes and salience towards the beetle, management preferences, and demographics were also measured. Though respondents indicated pine beetle was an issue of importance for them, there appeared to be a lack of understanding about MPB. Generally respondents indicated a negative attitude towards the beetle; however, supported management intervention for helping to control pine beetle outbreaks within the national parks (McFarlane et al., 2006). It was found that participants may self-assess their knowledge higher than it is in actuality. For example, respondents that self-assessed themselves as at least having some knowledge of MPB were found through the objective knowledge rating to not have much knowledge about MPB (McFarlane et al., 2006). Respondents may have knowledge or awareness of a term or concept, but may exhibit less knowledge at a finer level of knowledge related detail. For example, Papageorgiou (2001) found that study participants were familiar with the term national park. In reality, they exhibited a poor understanding of the content of the concept of national parks. Hocket and Hall (2000) found that few respondents who indicated they had taken a wilderness trip were knowledgeable about wilderness. For self-assessed knowledge, the results suggested individuals who believed they knew what wilderness was, were really not as knowledgeable as they believed.

Müller and Job (2009) examined visitor attitudes towards bark beetle in Bavarian Forest National Park, Germany through in-person surveys. A subjective knowledge rating was used to gauge beetle knowledge. Knowledge results of respondents' bark beetle knowledge and its impacts was found to be average ( $M = 3.1$ ) and respondents indicated a neutral attitude towards the beetle (Müller & Job, 2009). Close to 64% of respondents correctly believed that the bark beetle was the agent of the forest dieback. Respondents viewed the bark beetle outbreaks more favorably in a consistent manner than the park residents surveyed in McFarlane et al. (2006) and McFarlane and Watson (2008). Canadian National park residents and visitors were more favorable towards MPB management intervention, compared to German visitors who were slightly in favor of letting the outbreak follow its natural course without intervention (Müller & Job, 2009). In contrast to McFarlane and Watson (2008) which focused on visitors in Canadian national parks, German park visitors slightly disagreed that the bark beetle poses a threat to the park ecosystem and they also disagreed that it would have a negative impact on tourism and visitor experience (Müller & Job, 2009).

McFarlane and Watson (2008) appeared to have the only study related to risk perception by park visitors of natural disturbance (i.e., mountain pine beetle) within protected areas (Banff National Park and Kootenay National Park). Their study drew upon data from two previous studies, one in 2003 and one in 2005. Both studies contained a knowledge component consisting of self-assessed MPB knowledge (which was self-evaluated on a four point scale ranging from having *never heard of it* to *knowing a lot about it*). Study two contained an objective assessment of MPB knowledge (collected through true or false or not sure statements). This was in addition to the self-assessed knowledge for those that had indicated at least some MPB knowledge. Study one also collected on perceptions of ecological risk, attitudes towards MPB, management control preferences, and general demographics. The second study focused more on in-depth cognitive and emotional evaluations of MPB risk (McFarlane & Watson, 2008). It also gathered management control preferences, and general demographics. Ecological risks were defined as “threats to the health and productivity of species and natural environmental systems” (McDaniels, Lawrence, Cavanagh, & Slovic, 1996, p. 341). Mountain Pine beetle hazard was unique. For people that lived outside its area of impact, it may have been a new hazard to them. To avoid participant burden, only those respondents who indicated a minimum of some pine beetle knowledge were asked to complete the in-depth MPB questions. These questions related

to risk, management intervention and eight knowledge (true, false, or not sure) questions (McFarlane & Watson, 2008). Knowledge results pertaining to study one revealed that approximately 64% of visitors at a minimum knew at least something about MPB. In study two, over 73% of respondents were mostly not familiar with MPB (were either not familiar or had heard of it but were did not know anything about it) (McFarlane & Watson, 2008). It should be noted however, that study one surveyed only Canadian visitors whereas study two surveyed both Canadian and non-Canadian visitors.

### **2.5.3.2 Biodiversity and Fauna**

Research that examined the ecological knowledge of biodiversity, animals, or specific wildlife species along with associated attitudes, perceptions, and preferences was also present in the literature. Participant knowledge about a species is important to understand as it has implications for realistic, acceptable management options (Lafon, 2002). In a small urban park in Germany, Randel, Höllwarth and Schaal (2007) compared people who had never visited the park with park visitors. They found the park visitors scored better than non-visitors on their knowledge of fauna species. Participants were interviewed at the park and at other various settings outside of the park (focusing on individuals who had never visited the park). Knowledge of animal species increased with age, the number of park visits and with educational level. In Virginia, U.S., the knowledge, opinions, and attitudes of stakeholders towards black bears were examined (Lafon, 2002). Using a self-administered questionnaire, the knowledge component of the survey contained 15 multiple choice questions related to black bear ecology. It was found that knowledge varied across the three main stakeholders groups and hunters were the most knowledgeable. Attitudes varied across and within the three stakeholder groups; however, it was determined that knowledge about bears related inversely to negativistic attitudes and positively to ecologicistic attitudes (Lafon, 2002). It was shown that stakeholder participation seemed to improve stakeholder knowledge about bear management. Stakeholder support for high-profile management options (e.g., lethal methods) increased, but their opinions about bear hunting were not affected (Lafon, 2002).

Maw (1989) investigated visitor knowledge, perceptions, attitudes, and management perceptions of bears in Waterton National Park, Canada. There were seven questions presented to participants that gauged their knowledge of bear biology (e.g., diet, weight, etc.). Each

question was assigned a bear knowledge value (from 1 to 5). A total bear knowledge value score was calculated from all seven questions. In general, respondents did not rate as being very knowledgeable in the biological themes represented through the questions. Socio-demographic characteristics were examined related to knowledge levels. Age, education levels, visitor-type, and information sources related to bears were found to be significant. Randler et al. (2007) had found that age, number of park visits, and educational level influenced animal species knowledge.

Similar to Randler et al. (2007) where it was found that visitors had a positive attitude towards animals, it was found that visitors had a positive attitude towards bears. Kellert (1985) similarly found that participants that had a greater knowledge of animals had more positive feelings towards wolves. This contrasted Ericsson & Heberlein (2003) where it was determined that a large proportion of the general public did not care about wolves.

McFarlane (2005) examined forest biodiversity in relation to public perceptions of risk in British Columbia, Canada. Participants completed a mail survey that contained measures of knowledge related to biodiversity and biodiversity issues and components such as perceptions and risk. Biodiversity knowledge was measured through self-assessment and researcher assessment. Participants indicated their familiarity with the term biodiversity through a scale of *having never heard of the term* to *utilizing the term often*. Knowledge of issues related to biodiversity was measured through 11 true or false or not sure questions. The number of correct answers was tallied to create a final knowledge score. Risk was measured through a 5-point scale (*no threat* to *great threat*, including *no opinion*) with respondents assessing 15 hazards and indicating their perception of risk to forest biodiversity (McFarlane, 2005). Forest insects and disease were perceived as the greatest risk to biodiversity (McFarlane, 2005). Results specific to the knowledge measures were not presented; however, it was found that knowledge or socio-cultural variables exhibited a lower effect on perceived risk than value orientation (McFarlane, 2005).

### **2.5.3.3 Natural History and Ecological Knowledge**

Measures of general ecological knowledge have also been examined in the literature. D'Antonio et al. (2012) used surveys to examine the relation between visitor knowledge, characteristics, and perceptions in the Bear Lake Corridor of Rocky Mountain National Park,

U.S. Knowledge of natural history and management issues were determined through a visitor self-assessment on a scale of 1 (*no knowledge*) to 3 (*proficient knowledge*). Resulting from this, a total score of ecological knowledge was calculated into one variable. It was found that visitors generally did not self-rate themselves as having a proficient level of ecological knowledge. For management issues, they self-rated themselves as being most aware of mountain pine beetle; for natural history, they were most familiar with wildlife and water. Visitors' ecological knowledge was shown through structural equation modeling to be more important in relation to visitor's perceptions of resource impacts than the frequency of visits to the location. In particular, it was found that there was a positive effect between the perception of resource impacts and the level of knowledge. Leujak and Ormond (2007) determined that perceptions of reef health were related to knowledge levels as well as the frequency of visits, nationality, and experience level of the participant. In particular, groups that were more recent visitors with less knowledge had better reef satisfaction (Leujak & Ormond, 2007). However, a higher knowledge level did not typically correlate with positive behavior. Alessa, Bennett, and Kliskey (2003) found that individuals with a higher knowledge level of intertidal ecology were not less likely to engage in depreciative behavior (e.g., collecting sea animals etc.). They observed individuals that had exhibited higher knowledge levels engaging in more depreciative behaviors than those with less knowledge.

Studies mainly utilized a subjective self-assessment of knowledge (McFarlane et al., 2006; Papageorgiou, 2001) or an objective measure of knowledge measured by the researcher (Ericsson & Heberlein, 2003; Fly et al., 2000; Kellert, 1985; Maw 1989; Neuman et al., 2003) or combinations of both (D'Antonio et al., 2012; Hockett & Hall, 2000; Leujak & Ormond, 2007; McFarlane, 2005). Randler et al. (2007) had a variation from typical knowledge questions where they utilized photographs of animal species to test visitor knowledge through species identification. This was in addition to answering basic questions related to plants and animals. In general, the methods chosen to assess participant knowledge were dependent on the research questions, goals, and objectives of the study, resources, and sample size.

## **2.6 Place Attachment**

People are often integrated with their surroundings and places that they live, work, and recreate within. According to Smale (2006) "place embraces the properties of the environment or location where meanings are constructed and social relations are manifested." (p. 372). Early

theoretical explorations into place related concepts were carried out by individuals such as Tuan (1977) and Relph (1976). These were pivotal works in their time and formed the foundation for much of the current place-related research. Over time, many definitions and conceptualizations related to place have emerged (Beckley, 2003; Farnum & Kruger, 2008; Inglis, Deery, & Whitelaw, 2008; Lewicka, 2011). These have arisen within various disciplines including but not limited to psychology, sociology, and geography. The relationship between people and their surroundings can lead to the development of an attachment, where these places gain special value or meaning (Warzecha & Lime, 2001). More often than not, the relationships between people and a place are varied and complex (i.e., uses, meanings, and values) (Williams, 2008).

Scannell and Gifford (2010) reviewed and synthesized much of the research on place attachment and the result was a three-dimensional person-process-place framework. *Place attachment* according to Scannell and Gifford (2010) was defined as “a bond between an individual or group and a place that can vary in terms of spatial level, degree of specificity and social or physical features of the place, and is manifested through affective, cognitive, and behavioral psychological processes” (Scannell & Gifford, 2010, p. 5). For the purpose of this study the above definition will be utilized. Past research on place attachment frequently mentions two underlying sub-dimensions: place identity and place dependence (Williams & Vaske, 2003; Williams & Roggenbuck, 1989). *Place dependence* arises from “the fit between one’s intended use of an area and the area’s ability to adequately provide that use, especially relative to alternatives” (Farnum, Hall, & Kruger, 2005, p. 4). For example, place dependence in a Willmore context would be the degree to which individuals required Willmore as a setting for horse packing trips. There is a dependence present on the place for either a work or recreational activity (Inglis et al., 2008). Whereas *place identity* is how an individual views oneself in relation to the place or environment (Proshansky, Fabian, & Kaminoff, 1983). Place identity refers to the emotional or symbolic attachment to place (Inglis et al., 2008). For example, place identity for a Willmore user could be memories of special moments as a child with family members while on a trip in Willmore. Or it could be a visitor’s feelings for the unique ridges or mountains in Willmore.

Other dimensions have also been proposed and observed in empirical studies including: place affect (Halpenny, 2010; Jorgenson & Stedman, 2001; Kyle, Mowen, & Tarrant, 2004);

centrality to lifestyle (Bricker & Kerstetter, 2000; Gross & Brown, 2008); nature bonding (Hidalgo & Hernandez, 2001; Raymond, Brown, & Weber, 2010); social bonding (Ramkissoon, Weiler, & Smith, 2012; Raymond et al., 2010); familiarity, belongingness, and rootedness (Hammitt, Backlund, & Bixler, 2006); and place history (Kaltenborn, 1997). Although there have been many important research contributions of place attachment to date:

“Many researchers now call for an expanded research lens with a more diverse set of questions. Further research should center attention beyond an examination of the strength of an individual’s attachment and focus instead on: 1) what one senses and is attached to (Stedman, 2003b; Williams & Stewart, 1998); 2) what factors affect the formation of place attachment including the impact of physical settings versus social relationships (Stedman, 2002; 2003a; 2003b; Kaltenborn, 1997), behaviour (Stedman, 2003b; Walker & Chapman, 2003); and, activity orientation (Bricker & Kerstetter, 2000; Kyle, Bricker, Graefe & Wickham, 2004a); and 3) what effect place attachment has on an individual’s attitudes, level of satisfaction, behavioural intentions and behaviours towards a particular place (Stedman, 2002; 2003b; Walker & Chapman, 2003) or the environment in general (Vaske & Korbin, 2003)” (Halpenny, 2006, p. 9).

This thesis addresses the first two calls for research listed in Halpenny’s (2006) dissertation, examining what individuals’ sense and are attached to, and what factors or processes affect the formation of place attachment.

This section is not intended as a comprehensive review of place related terms, scales, dimensions, concepts, research and literature. Rather, the intent is to provide an appetizer to the many entrée choices that exist related to place. This study focused on visitors to a protected wilderness park, therefore a selection of key papers related to outdoor recreation, parks or protected areas, and natural resource management were reviewed and helped guide and examination of people’s relationship to a place (i.e., Willmore) for this study. For detailed summaries of place related concepts, it is recommended the reader review the following publications: Farnum et al., 2005; Krugar & Hall, 2008; and Lewicka, 2011. In the process of examining visitors’ relationship with Willmore, I also plan to be aware of their sense of place. “*Sense of place* is the awareness of the spirit associated with place and the qualities it possesses, and is therefore a faculty or feeling possessed by the individual rather than of the place itself” (Smale, 2006, p. 372). This sense of place can inform attachments.

Place attachment has evolved into an important concept within the fields of outdoor recreation and protected areas management and can provide valuable insight to managers, staff,

visitors, and the general public. Place attachment can inform management understanding about the provision and maintenance of optimal recreation experiences. This can be achieved by helping to learn how individuals or groups may react to potential management decisions and outcomes, and through helping to understand the public's potential role in decision-making (Farnum et al., 2005). Strongly attached users may also be more likely to volunteer their resources (i.e., time and money) to management efforts related to the place (Presley, 2003). For example strongly attached users may be more keen to participate in volunteer activities such as board positions, trail clearing and maintenance, work bees, or participate in groups or organizations related to the place. Understanding place attachment may also be useful for marketing and communications of a place for recreation tourism or destination marketing. For example, Yuksel, Yuksel, and Bilim (2010) explored how place attachment may predict trip experience satisfaction and loyalty to the destination through a questionnaire administered to resort visitors in Didim, Turkey. It was found that attachment was related to visitor satisfaction and appeared to be an important factor in destination loyalty. Understanding visitors' place attachment is important for developing and designing visitor communications, extension, and outreach (i.e., interpretation). McInnes (2010) explored the role of interpretation and place attachment for Waterton National Park, Canada visitors. It was found that interpretive material did not influence place attachment for all participants and that other factors contributed to attachment (McInnes, 2010). However, it was noted that interpretive material was one factor that managers and staff had control over compared to other factors (e.g., frequency of visitation, weather etc.). Therefore, the role of interpretation in fostering place attachment was important for national parks managers and staff to learn.

Place attachment studies tend to be divided into qualitative and quantitative studies; however, as mentioned, much of the focus of past empirical research has been on measuring the level of place attachment (i.e., strength of attachment). For example, Williams, Patterson, Roggenbuck, and Watson (1992) measured and contrasted emotional and symbolic attachment with use history, place substitution, trip and visitor characteristics, and perceptions of wilderness impacts in four U.S. wilderness areas. These authors also noted the importance of the scale and area of interest for the measurement of place attachment. For example, is one interested in researching place attachment within a specific study area (e.g., Jasper National Park) or the attachment to the overarching categorization of national park? Williams et al. (1992) asserted for



wilderness areas, there may be two types of attachment to consider: (1) the individual study area and (2) the representation of the type of area (e.g., wilderness). The authors also noted that an understanding of such place relationships assist wilderness managers appreciate “conflicting public reactions to wilderness allocation, planning, and management decisions” (p. 33). In another study, Moore and Scott (2003) investigated scale through the comparison of attachment levels between an individual trail versus the entirety of the park that the trail existed within. This was determined in a regional park in Ohio, U.S. Personal activity commitment was found to be the best predictor of both the trail and park attachments.

Within an activity specific context, Bricker and Kerstetter (2000) examined the attachment and level of specialization of whitewater enthusiasts on the South Fork of the American River, California. The researchers discovered a relationship between level of specialization and place attachment dimensions (i.e., experience level, lifestyle centrality, enduring involvement, skill level and economic and equipment expenditure level). The resulting management implications included: helping to learn how places are defined and valued by the user, the identification of deeply connected users which were therefore potential future stakeholders, recreation behavior, and an improved understanding of how individuals perceive various management scenarios. Place attachment has also been utilized to examine attitudes and behaviors of visitors within various settings. Warzecha and Lime (2001) examined place attachment, attitudes, and perceptions of river recreationists at the Green and Colorado Rivers, Utah. River users were found to differ in their trip motivations and management preferences between the two sites. Within a Canadian context an exploratory study was carried out at Elk Island National Park with visitors. The goal was to learn about the potential relationship between pro-environmental intentions, place attachment, perspective-taking, and empathy. The place attachment of visitors positively affected the ability and willingness of the visitor to take the park’s perspective. Both place attachment and empathy significantly affected most pro-environmental intentions, however empathy and place attachment were not significant in self-focused depreciative behavior (Walker & Chapman, 2003). In Point Pelee National Park, Ontario, the relationship between visitors’ general and place-specific pro-environment behavioral intentions were examined through a mail questionnaire (Halpenny, 2010). Place attachment was a strong predictor of place-specific pro-environment behavioral intentions. They were slightly less predictive for more general pro-environment behavioral intentions (Halpenny, 2010).

Place attachment has also been explored in regards to perceptions of recreation impacts. White, Virden, and van Riper (2008) used questionnaires to examine the effects of prior experience and place attachment on visitor perceptions of social and environmental conditions. This study was carried out in the Molalla River Recreation Corridor and the Table Rock Wilderness in Oregon. It was determined that prior experience was significant in predicting place attachment levels as well as their perceptions of depreciative behavior, ecological impacts, and conflict (Inglis et al., 2008). This study provided important management information including: where to focus management efforts (i.e., what areas of management effort will have public support), the identification of potential displacement of certain visitors (and the need for monitoring potential displacement), and where to focus visitor information and communications outreach.

Place attachment complexly intertwines with other factors and variables to determine why individuals go to specific places rather than others (Farnum et al., 2005). Through their literature review, Inglis et al. (2008) noted that place attachment could be formed through the investment of time, energy, or emotions at a location through either work or play. Additional factors Inglis and others found to be relevant in the creation of place attachment included: an appreciation of the landscape, knowing the place exists and the individual has the right to access the place, repeat visitation, activity participation in the place (and those with a higher level of specialization being prone to a greater attachment), membership or belonging to an organization, group or club, or experiences of solitude and satisfaction within the place (Inglis et al., 2008). Interestingly, the researchers also noted that one can become attached to a place through media promotion. For example, one could become attached to Willmore through visual media and communications of Willmore (e.g., websites, magazine feature articles, etc.). They also noted that a person may not even be aware of their own attachment until the place they are attached to becomes threatened (Inglis et al., 2008). It is important to note however, that less frequent users such as first time visitors to an area may have become attached to the area prior to their first visit (Halpenny, 2006). This attachment, according to Halpenny (2006), could be developed through stories about the place through social interactions with friends or family or media influences.

In summary, place attachment has been examined within a variety of natural recreation settings, contexts and scales and some of the research has been convergent while other findings

have been divergent. Previous research has assessed levels of attachment using a variety of measures and dimensions, and has examined place attachment in relation to levels of specialization, attitudes and behaviors, pro-environmental intentions, empathy, perception of recreation impacts, visitation, and interpretation. The main message that has arisen from this condensed literature review is that place attachment is complex and dynamic and cannot just simply be translated from one location or site to the next. Future research should focus on a variety of scales and contexts with a variety of user types through time. Often, locations such as Willmore are extremely unique, and cannot be compared to wilderness areas in the U.S. or otherwise.

Investigating place attachment may help identify which places are important, but do not address the why or how underlying the importance (Smale, 2006). Qualitative place studies tend to contrast individuals resulting in what some may refer to as typologies (Lewicka, 2011). This can also be achieved through quantitative methods. According to Lewicka with the current “unprecedented paradigmatic revolution in psychology and related sciences which obliterates many of the traditional divisions” (p. 56) and new and innovative data analysis techniques, it may be a matter of time before the classic breach between these two methodologies dissolves (Lewicka, 2011). This project utilized both qualitative and quantitative methods in attaining place information within a mixed-methods context. As expressed, a mix of quantitative and qualitative measures can offer profound insight into people’s relationship with places and can complement one another (Lewicka, 2011; Manzo, 2005).

### **2.6.1 Place Meanings**

Though they are closely inter-linked, place meanings are different from place attachment. This is especially true when referring to the same geographic space (Spartz & Shaw, 2011). Place meanings can be described as stories about place (Krugar & Williams, 2007; Stewart, 2006; Stewart, 2008; Williams, 2008) as opposed to just physical properties of the place (Williams, 2008). It is through these stories of environmental experience that place meanings are embedded, and in doing so, “the personal and social complexities of place meanings come forth” (Stewart, 2006, p. 408). Place meanings, unlike place attachment, do not measure, and reveal intensity of attachment nor do they tell us “the degree of our bonding, or the extent that one place is better than another.” (Stewart, 2008, p. 84). They are essential in helping us with learning the *what kind*

instead of the *how much* (Stedman, 2002; Stewart, 2008). Stedman (2002, 2003) conceptualized place meanings as being more cognitive based as opposed to emotion-based and are descriptive in nature. More recently, Williams, Stewart, and Kruger (2013) utilized the term meaning, to convey “various forms of knowledge and beliefs about a place (including scientific and traditional or local forms of knowledge), as well as deeper, more emotional, symbolic relationships between a person or a group and a place” (p. 5). Place meanings can also encapsulate more difficult to grasp meanings than those that have been traditionally considered within the natural resource management realm (Williams et al., 2013). These may include for example, spiritual, symbolic, and historical meanings. It is important to note, as Williams and Patterson (2007) asserted, that attributes of place differ from meanings and meaning is a relationship between the person and object “mediated through culture and past experience” (p. 936).

Stedman (2003) pointed out that a large majority of past research had neglected the role of the physical environment, mainly focusing on place attachment and meanings as products of shared behaviors and cultural processes. He determined, through his study of lake property owners in Wisconsin, that physical landscape characteristics were important but related to place attachment and satisfaction in different ways. The importance of landscape attributes was also found by Wynveen, Kyle, & Sutton (2012) in their study of visitors to the Great Barrier Reef in Australia. Within this project, the researcher acknowledges the importance of social constructions of place but also at the same time acknowledges the biophysical landscape as also playing an important role. I plan to examine respondents’ perceptions and attitudes towards both physical attributes and social aspects of the Willmore experience.

As described by Farnum et al. (2005), many researchers have used the terms place attachment and meanings interchangeably and some have not defined the concept of place meanings. Farnum et al. (2005) recommend keeping the two concepts separate analytically and empirically while pointing out that meanings seem to encapsulate both symbolic and evaluative beliefs. For the purpose of this research, to the lack of formal definition for *place meanings*, they will be defined similar to Stedman (2002) as beliefs or cognitions of a setting or place that reflect the value, importance or significance to an individual. These beliefs and cognitions are translated

into a form that the researcher can record and subsequently interpret through stories of place meanings in Willmore.

Hutson and Montgomery (2010) identified that the “depth, diversity, and structure of subjective place meaning perspectives have remained unexplored” (p. 422) in outdoor recreation resource related studies. As mentioned previously, the qualitative aspect of examining and exploring place is becoming more important and appreciated. Davenport and Anderson (2005) asserted that qualitative research for the human-environment relationship was expanding including place meanings and that by exploring people’s relationships with places “as expressed through their own words, these studies capture the subjective, lived experiences people have with nature” (p. 629). Within the literature, there appeared to be a growing number of qualitative studies; however, the number of studies was limited within an outdoor recreation and parks context. In a recreational study of whitewater river users of the American River in California, five overarching special place meaning dimensions were identified: Environmental-landscape, recreation, human-social, heritage-historic, and commodity (Bricker & Kerstetter, 2002). Continuing with the theme of rivers, Davenport and Anderson (2005) developed a *web of river meanings* that modeled the meanings ascribed to the Niobrara National Scenic River, Nebraska by local community members. Their model of river meanings encompassed a diverse array of personal, family, and community meanings which converged along four main dimensions: river as sustenance, river as tonic, river as nature, and river as identity. Their *web of river meanings* also revealed how landscape change can have various effects on place meanings and attachment which can translate into attitudes (Davenport & Anderson, 2005). Gunderson and Watson (2007) explored the relationship between people and the Bitterroot National Forest, Montana. They discovered that their relationship existed on different scales. In addition to participants having relationships with places they frequented, they also had a relationship with places they rarely went to or did not visit at all. Participants seemed to apply more intangible values to the latter such as intrinsic, cultural, and wilderness values (Gunderson & Watson, 2007). This coincides with what has been suggested by others (Low & Altman, 1992; Kyle et al., 2004) where people may identify with certain areas (e.g., national parks, wilderness areas, etc.) that they may not have visited or have visited infrequently. “The term national park may evoke culturally defined images that can also be considered symbols. In these instances, the object of identification is the symbol and meanings encapsulated by the symbol rather than a specific setting, per se” (Kyle et

al., 2004, p. 443). Gunderson and Watson (2007) found seven emergent themes across all interviews which included the following: ease of access to wild places, natural-roadless, unique contrast to everything else, familiar, historically important, or tradition, scenically attractive, physical features of significance, and work oriented. In a recent study that focused on *Friends of* members of an arboretum (urban natural area) in Wisconsin, four main themes emerged that summarized participants' place meanings (Spartz & Shaw, 2011). The four emergent themes were: sanctuary, society, activity, and nature. Three of these themes exhibited negative associations (e.g., activity theme had the negative aspect of no dogs allowed).

Some studies have utilized both qualitative and quantitative measures within their research of place meanings. Wynveen et al. (2012) used interviews to capture place meanings. These meanings helped inform and develop a questionnaire related to attachment within the Great Barrier Reef Marine Park, Australia. Ten emergent themes were identified. It was also found that as the importance of meanings increased, so did the degree of the attachment. This was one of the few studies that focused on place meanings within a marine park. Another study utilized Q methodologies to explore the topology of place meanings that recreational users ascribed to the Niagara Escarpment, Ontario, Canada. Three overarching place meanings themes were found: spiritual, intensity and physical expression, and sense of self (Hutson & Montgomery, 2010). Davenport, Baker, Leahy, and Anderson (2010) took a quantitative approach to explore the dimensionality of their newly developed place meanings scale. The scale was administered through a visitor survey in the Giant City State Park, Illinois. The scale resulted from an expansion and renaming of Davenport and Anderson's (2005) *web of river meanings* dimensions which were described earlier in this section. The final scale dimensions were: self-identity, community character, family legacy, experience achievement, nature and natural processes, and economic stability (Davenport et al., 2010). The authors were also interested in contrasting place significance with place meanings, so overall significance items were amalgamated with the place meanings items into one final scale. Place meanings were also contrasted between locals and non-locals. It was found the place meanings scale exhibited good reliability; however, the need for modifications to its dimensions were revealed through exploratory factor analysis. Local and non-local visitors were found to differ in their park connections, however the park was highly meaningful for respondents overall. For both types of visitors, nature and natural processes had the highest rated place meaning.

Understanding the significance and what makes recreation areas meaningful, is critical in light of increasing budget cut-backs and decreased program funding (Davenport et al., 2010). An improved understanding of place may also shed insight into the management and mitigation of controversies in land management, development, and community change (Davenport & Anderson, 2005; Kruger, 2006). Things such as modifications to the biophysical environment may affect place meanings (Spartz & Shaw, 2011). Stedman (2003) stated “even if overall levels of attachment do not change as a result of changes to the physical landscape, the *basis* of attachment (the meanings that people are attached to) may change dramatically” (p. 680). Therefore, within a wilderness setting, the introduction of prescribed fire, forest fuel modification (i.e., Firesmart), infrastructure (e.g., buildings, bridges etc.) could potentially impact visitor place meanings. In a study of national forest meanings of the Bitterroot area in Montana, it was found that residents attached a variety of meanings to wilderness region of the area (Gunderson, 2006). Residents were also found to have varying opinions about prescribed fire. As a result, managers were better prepared to anticipate how prescribed burns may affect people’s relationship to the landscape and therefore their potential support or non-support for this management action (Gunderson, 2006). These meanings are therefore important to consider in natural resource management decision-making processes (Stewart, 2008; Christensen, Watson, & Burchfield, 2007). Meanings that people assign to place may also be related to attitudes and expectations related to appropriate use or activities within an area (Davenport & Anderson, 2005; Kruger & Williams, 2007; Kruger & Hall, 2008; Yung, Freimund, & Belsky, 2003). This acquired knowledge can be used by managers to help inform management planning such as park management plans or visitor management strategies. Stewart (2008) stated that “the lack of adequate venues to negotiate place meanings is symptomatic of a larger crisis of representation across society” (p. 98). For example, management planning can often exhibit unidirectional communications flows that under-represent the meanings that stakeholders have. It is therefore important to develop new and innovative methods in wilderness and protected areas planning that involve users in a positive and pro-active dialogue. This helps to promote a two-way flow of open communications.

It is important to be aware that meanings ascribed to place are not static and are indeed complex. Not everyone will hold the same place meanings for an area. It is therefore important for managers to be aware of possible divergences between people and groups related their

identification of meanings (Krugar & Williams, 2007). Understanding these divergences is important for conflict management (Kruger, 2006) so that potential conflict can be approached and considered early on. Emotional and symbolic meanings for example, can be emotionally deep, the most intense, and result in contentious conflict (Presley, 2003). “Local politics is never more complex than when more than one group claims to be representing local interests” (Williams & Stewart, 1998, p. 22). This could also be expanded to include when just one group claims to represent local interests, and where perhaps, other less vocal individual and group meanings are not heard. Meanings are dynamic, they change over time, are continually created, actively contested (Yung et al., 2003), audience-sensitive (Stewart, 2006; Stewart, 2008), multi-dimensional, and complex (Bricker & Kerstetter, 2002). For example, Hawkins and Backman (1998) examined the place attachment and perceptions of long-term Chattooga Wild and Scenic River Corridor users. The long term users (i.e., vacationers) were horse users and the short term users (i.e., sightseers) were whitewater rafters. It was found that the longer-term horse riders exhibited strong place attachment for the area and exhibited irritation and annoyance towards the whitewater rafters. The horse riders often resided locally and were frequent visitors to the Chattooga. They also had a strong social network of other locals. The rafters were viewed by the horse riders as being less committed and as a “relatively new and intrusive addition” (p. 99) to the tourist base (Hawkins & Backman, 1998). They were viewed as having the potential to affect the traditional experiences of the horse riders.

It is important for land managers to also be aware of their own place meanings so that they are better enabled to work with stakeholders. Van Riper, Kyle, and Yoon (2011) pointed out that there was limited research that examined the place meanings of land or protected areas managers. These researchers discovered that managers exhibited emotional attachment with the areas or environments that were under their management jurisdiction (van Riper et al., 2011). According to Stewart (2006), place meanings are difficult to know and that individuals “are not always conscious of the meanings of our environments, they are situationally defined, and dependent upon negotiations with other people and places” (p. 408). For the purpose of this research, it is recognized that there are inherent contested meanings within the place meanings exploration aspect of this research; however, the focus will be on the shared meanings of place while bearing in mind and acknowledging where appropriate identified differences. I feel these inherent differences are important as they reveal differences between individuals which is



important for prediction of potential conflict and disagreement. Gaining insight into these possibilities ahead of time is important for future decision-making processes and frameworks.

### **2.6.2 Special Places**

It is important to briefly discuss special places. Many of us have heard of special places and probably have special places of our own, but how exactly are they defined and how do they relate to or differ from other concepts of place? In some studies described within this section, study participants were requested to describe their favorite or special places and gauged as to the reasons why they were special or what made them special. Bricker and Kerstetter (2002) described a special place as denoting “something of particular value and therefore allows for a range and degree of interpretation of places people have imbued with meaning” (p. 398). Schroeder (2002) described the importance of aesthetic and emotional experiences within “specific places or types of settings” (p. 8) and how these places become significant and subsequently become *special places*. Parallel to how the place meanings of an individual may become altered due to landscape change, a person may experience deep emotional effects if their special place is altered due to anthropogenic (e.g., prescribed burn) or natural events (e.g., flood). “People become attached to such places, in much the same way that they become attached to a good friend or a family member” (Schroeder, 2002, p. 8). Schroeder (1996) investigated the qualities and experiences related to special places on the Black River, Michigan. Beauty of the area was commonly mentioned, along with features related to wilderness, history, community, and culture (Schroeder, 1996). Schroeder had found commonalities between this study and a previous study he had done based on the same survey technique. The other study focused on an Arboretum near Chicago which was located in a more developed and populated area in comparison to the more remote Black River site. “The importance of beauty and serenity in the experience of natural places, and the presence of a harmonious blending of natural and human influences were important themes in both studies” (Schroeder, 1996, p. 11). Through 15 years of survey data collection with a variety of people and study sites, Schroeder (2002) identified the environmental features, overarching experiences, meanings, and values that were encompassed by the special places described by participants. There was much diversity in the respondents’ descriptions of their experiences, meanings and values as well as some common themes such as beauty. Eisenhauer, Krannich, and Blahna (2000) examined special places on public lands in Utah through gauging participants on their activities at and the reasons why the places were

regarded as special. It was discovered that certain environmental features, relevant social interactions, and convenience related to an activity, were important factors of special places.

Learning about special places will not only help to ensure these places remain available to people, but also alert land managers that certain management actions may affect places and specific sites that people have become attached to, or raise alarm or concern as people learn of proposed management decisions. It is important to consider these sites and maintain open communications with stakeholders in land and protected areas planning to ensure both visitor and resident experiences are maintained and preserved on the landscape.

## **2.7 Summary of Literature Review**

In summary, the review of the literature shows that various combinations of visitor monitoring methodology have been utilized in different areas in the world. Managers that are considering the implementation of a visitor monitoring program have a variety of instruments to choose from. In general, it was found that literature related to mixed-methods such as video monitoring, trail cameras, and GPS technology was limited. The literature that did exist and utilized mixed-methods provided interesting insight into visitor behavior and visitor use patterns. Arnberger et al. (2005) summed up visitor monitoring by stating, “ultimately, the accuracy of visitor counts is a function of both the method chosen and the way the method is implemented” (p. 325). The use of new technology introduces challenges and steep learning curves; however, it also provides new opportunities. With the advancement and the emergence of new technologies, the potential for future applications and research remains exciting. It should be noted, that with the exception of Simic’s (2008) research in Banff National Park, there have been few published studies that have utilized a mixed-methods approach to visitor monitoring in Alberta. Therefore, this literature review has identified the combination of self-administered trail surveys, GPS Tracksticks, and trail cameras for visitor monitoring, as being a fairly unexplored approach in Alberta.

In relation to the literature pertaining to visitor knowledge, research often took a mixed-methods approach and publications were limited that focused on measuring the knowledge of visitors in relation to the protected area or park that they were visiting. Knowledge or awareness was often a component the research and was inter-related to perceptions, attitudes, and management preferences. It was found that the relationships between these various constructs

were dynamic, complex, and evolving and may even differ depending on things such as geographical context (i.e., site specific), demographics, and socio-cultural variables, to name a few. Visitors' knowledge or familiarity of the area they were visiting had implications related visitor experience, satisfaction, communications and outreach, and learning or educational opportunities.

The literature review also revealed that REP scales have also been used in studies to determine motivations between and within activities. It was revealed that non-motivational factors also influence motivations; however, there were few studies that examined the motivations between the various user groups within a particular area. With the exception of Dear et al. (2005), Grafe et al. (2000), and Thapa et al. (2004), most studies focused on determining the motivations of people within an activity. In general, there were few studies that examined the motivations of horseback riders, and no studies were located that examined the motivations of outfitters or commercial trail operators. Two studies were located in relation to the motivations of mountain bikers; however, mountain bikers and their motivations seem to be under-represented in the existing literature. It was also revealed by this literature review that there was an existing gap in the study of visitor motivations within protected wilderness areas in Alberta. By studying the motivations of wilderness users within the Willmore Wilderness Park, this information will contribute to existing research and will help fill a gap in the study of motivations not only in Alberta, but in also in Canada.

In summary, there were a diverse array of place-related literature within the realm of recreation and protected areas. A majority of the studies consisted of quantitative methods. Because this study focused on the qualitative aspect of place meanings, a greater emphasis was placed on this aspect of the literature review. Perceived gaps included a sparse amount of literature that explored integrated meanings of place (i.e., social and environmental or ecological or landscape). This gap has been identified by various researchers. For example, Beckley (2003) posed a range of research themes or hypotheses that he suggested could help add depth to the understanding of place attachment. These themes or hypotheses were based on the premise that sociocultural and ecological aspects of place were defined too narrowly and needed to be examined in a more comprehensive and integrated manner. More recently, researchers such as

Raymond et al. (2010) have called for further exploration and incorporation of these factors to learn how they may affect people's attachment to place.

In general, there were few studies of place meanings within a Canadian context. There were no recently discovered studies that explored the place meanings of protected or wilderness areas in Alberta. The exception was Ashley McInne's Master's thesis which examined the role of interpretive material in developing visitor sense of place in Waterton National Park, Alberta (McInnes, 2010).

### 3.0 METHODS

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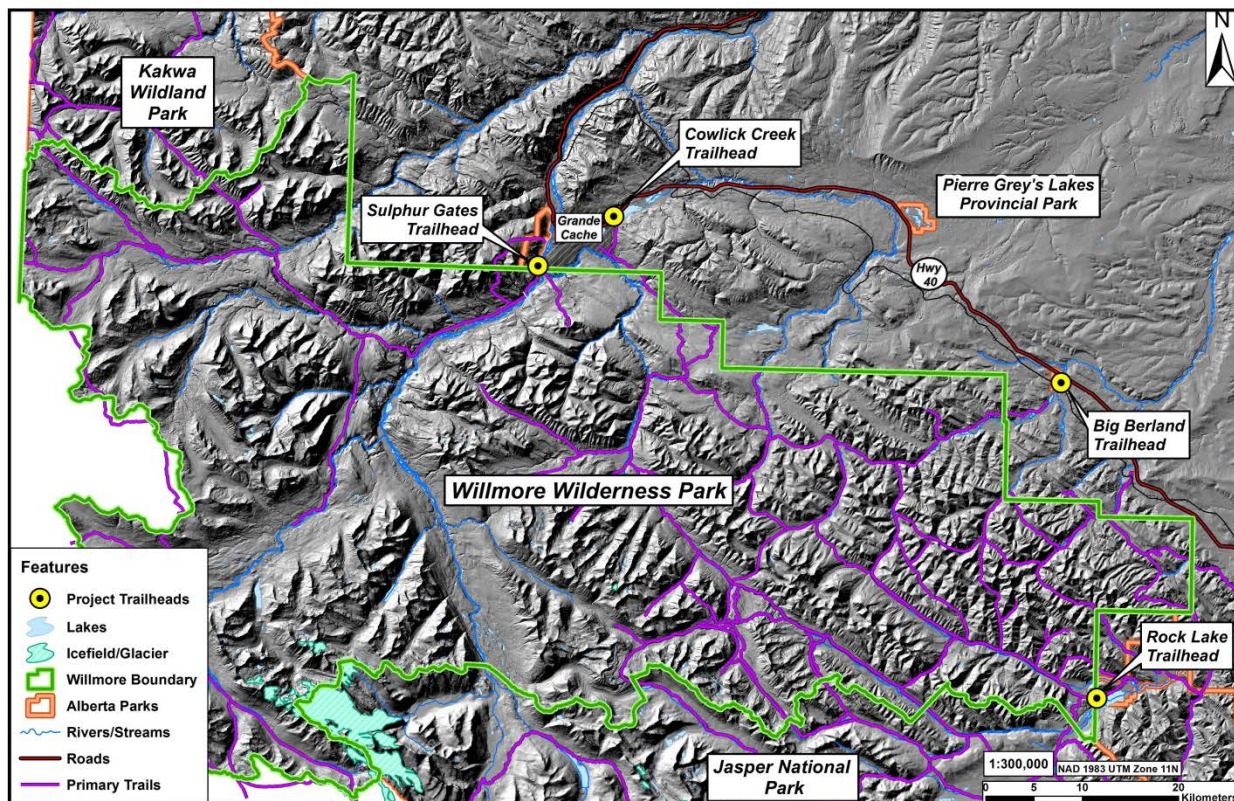
*"I like the idea that you're doing a survey and that you're asking questions. I think that means you're gathering data from people who use the park, so people can learn what people are doing in the park and what they want. It's something that probably ought to be done regularly. Who's out there? Who's using it? What are some of their needs?" - Kimberly*



In order to address the need for acquiring an improved understanding of Willmore Wilderness Park visitors, a mixed-methods approach was employed. The approach consisted of trail cameras, self-administered trail surveys, GPS Tracksticks, mail surveys, and in-person or telephone interviews. This chapter summarizes the study context, the rationale, purpose and objectives, deployment, and data management aspects associated with both the quantitative and qualitative project study instruments.

### 3.1 Study Context

As described, the study area for this research was the Willmore Wilderness Park. In light of numerous entry and exit points into Willmore and limited project resources, it was most logical to deploy the field instruments (e.g., trail cameras and self-administered trail surveys) at the four main Willmore Wilderness Park staging areas within Alberta (Figure 2). I estimated that visitor use was the highest and most concentrated at these four areas. Visitor travel outside of the main staging areas was possible, however travel can be challenging. It was assumed that the majority of visitors utilized the main staging areas to begin or end their trips. The four sampling staging areas were: Big Berland, Cowlick Creek, Rock Lake, and Sulphur Gates.



**Figure 2. Willmore Wilderness Park Sampling Staging Area Locations**

## 3.2 Methods and Theoretical Perspective

It is important to note that this study was an applied study and was also exploratory in nature. The results of the study were not intended to be generalized to all Willmore visitors and wilderness contexts. Existing theories in the literature informed but did not dominate this research. Specifically, there were no previous academic social science studies and sparse human dimension base information that existed for Willmore Wilderness Park. Applicable wilderness studies from other areas (where relevant) were applied in a general sense to the results obtained from Willmore. One goal from this study was to contribute to the body of knowledge in human dimension research from around the world especially related to wilderness and natural areas. Table 2 summarizes the research questions and the associated study instruments that were utilized to gather data to address each question.

**Table 2. Project Research Questions and Associated Study Instruments**

Research Questions	Study Instrument
What is the visitation level of individual staging areas in Willmore Wilderness Park?	Trail cameras
What are the visitor characteristics, motivations, familiarity (awareness), risk perceptions, and management preferences of Willmore users?	Trail survey, in-depth mail survey, and trail cameras
What are the spatial patterns of visitor use?	GPS Tracksticks and trail survey
What are the trip characteristics and the main activities of Willmore users?	Trail survey, in-depth mail survey, and trail cameras
What is the relationship between visitors and the park?	In-depth mail survey and interviews (in-person/telephone)

## 3.3 Quantitative Data Collection

### 3.3.1 Trail Surveys

#### 3.3.1.1 Goals and Objectives

In order to collect basic visitor and trip characteristics, self-administered trail surveys were available at the four main staging areas into the Willmore Wilderness Park within Alberta (Rock Lake, Sulphur Gates, Big Berland, and Cowlick Creek). The goal was to generate a voluntary census of as many Willmore Park visitors as possible that used the park for day or overnight use. Specifically the main objectives of the trail survey were the following:

- a) to collect current information on visitor demographics and characteristics (e.g., origin, age & gender, group size & composition, number of previous visits to Willmore etc.);
- b) to collect visitor trip information (e.g., trip entry point, travel mode, trip type & length, main activity, trip destination etc.); and
- c) gather a list of potential participants to pursue additional information gathering with (i.e., in-depth mail-out surveys and interviews).

### **3.3.1.2 Rationale**

As mentioned above, trail surveys as part of a mixed-methods approach to data collection provided an unobtrusive and cost-effective method to collect basic visitor demographic and trip information. Because staging areas to Willmore can often be quiet (even on weekends), it was most cost and time effective to utilize self-administered surveys.

### **3.3.1.3 Survey Deployment**

#### **3.3.1.3.1 Staging Areas**

Survey distribution stations were constructed by Alberta Parks' staff. Survey stations consisted of a map and messaging board and compartments to store surveys and supplies along with a locking compartment to submit completed surveys. The station was mounted on a post (Appendix B) or to an existing structure (e.g., kiosk) (Appendix C). Survey stations were installed at the four main Alberta staging areas to Willmore: Big Berland, Cowlick Creek, Rock Lake, and Sulphur Gates. Trail surveys were available from mid-June until November 2010. The only exceptions were the Rock Lake equestrian parking area and the Eagles Nest cabin. At the equestrian parking area, a mail box mounted on an existing kiosk was used to distribute surveys, pens, and crayons. A locked wooden drop box was used to collect the completed surveys. Surveys, return envelopes and writing tools were also dropped off at some of the unlocked backcountry cabins in Willmore by Alberta conservation officers on backcountry patrol. Occasionally, surveys were distributed to backcountry users by conservation officers on backcountry patrols. Mailboxes were mounted (July 21, 2010) on the outside of Eagles Nest patrol cabin, one to hold surveys and writing tools and one to deposit completed surveys. This was to provide users an additional opportunity to complete a survey since the cabin appeared to be a major stopping point for users travelling both in and out of Willmore. If an existing trailhead kiosk was utilized to mount the survey station upon (e.g., Rock Lake public staging area) or if



the survey station was located near an existing trailhead kiosk (e.g., Sulphur Gates public staging area) then an effort was made to improve the kiosk to be more visually appealing. This was because the kiosks appeared abandoned and either had little or no park messaging or were missing a map of Willmore. Park messaging was provided by Alberta Parks for bear safety and parks rules and regulations, along with maps of Willmore (including plexi-glass to protect the map). At the larger staging areas (i.e., Rock Lake and Sulphur Gates), additional survey stations were installed at the commercial parking areas in addition to the public parking areas. This was in an attempt to make it easier and safer for horse users to complete a survey since surveys would be available before departing or completing a trip. The survey station had a sign to attract users to the station, a map of Willmore Wilderness Park, and general project information. Inside the survey station compartment were surveys, envelopes, pens, and crayons. Business cards with information on how to complete the survey online were provided for those who were in a rush or preferred to complete an online survey. Once completed, surveys could be inserted into a locked compartment in the base of the survey station. One person from each group visiting Willmore was requested to complete a survey (Appendix D) for their group before or after their trip. Each survey was in a postage-paid envelope so it could be completed and mailed back at a later date. Survey stations were monitored consistently (i.e., a weekly basis where possible) by project staff to replenish supplies and surveys, to gather completed surveys, and to monitor any vandalism or tampering. Posters urging users to complete a survey were also taped to the back of outhouse doors near the stations and were also posted where possible on structures near the survey stations.

#### **3.3.1.3.2 Visitor Information Centres**

Trail surveys were also available at surrounding area information centres (Hinton Visitor Information Centre, Switzer Park Visitor Centre, Grande Cache Tourism and Interpretive Centre and Jasper National Park Visitor Information Centre). Each information centre had a survey drop box for completed surveys with the exception of the Jasper National Park Visitor Information Centre. This information centre lost the entire survey drop box and survey supplies. Project personnel for this project were unaware the surveys and drop box were lost, so during the month of July, no surveys were available. Another replacement survey box, survey business cards, and survey supplies were provided in early August.

#### **3.3.1.3.3 Internet**

Trail surveys were available digitally through an online survey created through SurveyGizmo software which was hosted on the Foothills Research Institute Willmore Wilderness Park website. Digital survey documents (.pdf format) were also available on the Alberta Tourism, Parks and Recreation Willmore and the Town of Grande Cache websites. Business cards were available at visitor information centres and at trail survey stations. The business cards advertised the Uniform Resource Locator (URL) for the online survey. This provided the user a future opportunity to complete a survey if they did not have time to complete trailhead paper survey or if they preferred to complete a digital survey instead of paper. The Willmore Wilderness Foundation was emailed to see if they could have a link to the online survey on their website and they declined. The Willmore Wilderness Foundation is a registered charitable organization whose mission “is to preserve the history of the area; focus on the advancement of education of the park; restore historical pack trails and sites; and enhance use of Willmore Wilderness Park for Albertans and visitors alike” (Willmore Wilderness Foundation, n.d.). This organization is an example of a Willmore user group and appears to represent traditional and historic park interests and has carried out many of their own projects in Willmore related to their mission.

#### **3.3.1.3.4 Other Locations**

A survey drop box and blank surveys were dropped off at the Willmore Wilderness Foundation office in Grande Cache and at Bar F office near the Cowlick Creek staging area.

#### **3.3.1.4 Issues and Limitations**

The completion of self-administered trail surveys relied on the attraction of park users to the survey station, as well as the user having the initiative to stop and complete the survey or to mail the completed survey at a later date. Because the survey was voluntary, users may not have felt inclined or obligated to complete it. Survey station attractiveness, inclement weather, lack of time, group dynamics, mode of travel or general distraction may also be contributing factors in the users’ decision whether or not to investigate a survey station and to complete a subsequent survey. Though every effort was made to locate and make the surveys stations visible, it was possible that some users may not have noticed the survey stations. Group pressure may have also prevented survey completion if for example, others in the group were not interested in stopping

or the rest of the group continued down the trail. It may have been difficult for various users depending on their travel mode to stop and complete a survey. For example, it may have been easier for hikers and more difficult for a pack strings to stop at the survey stations (groups of horses that are part of a trip). Stopping can be especially challenging for larger groups of horses and riders since pack strings can be difficult to manage. Watson et al. (2000) found that voluntary registration by stock users was difficult to obtain. Other studies have found that hunters, visitors making short trips, and solo individuals were less likely to register (Dawson & Hendee, 2009). In general, the sample obtained through self-administered surveys was likely biased towards the demographic that was most likely to complete a survey. It was also possible that not all visitors had the ability to read or write in English. For those who spoke English but who may read or write poorly, there may have been challenges in understanding or interpreting the trail survey questions. An effort was made to use simple vocabulary in the questions, but what may have appeared simple for one person, may be viewed as complex by another. Poor respondent hand-writing can be a weakness of open-ended questions in general, and some responses may be difficult or impossible to read. Some user groups may have been protective about their trip information and providing this information to others. For example, during hunting season, it appeared that very few hunters or outfitters completed surveys. These users may not have wanted to divulge their hunting locations. It is common for visitors to be guided by professional outfitters who require a permit to operate in Willmore during certain times of the year (e.g., summer). Part of the reason for the permit being granted was for the commercial operator to provide their client statistics to Alberta Parks, Tourism and Recreation post-season. More often than not, this information was not provided or followed up on after each season. In other cases, some users informally guide others so they do not obtain a permit but technically could be considered a commercial outfitter. Nonetheless, there appeared to be low response rates by commercial outfitters and stock users for trail surveys.

#### **3.3.1.5 Data Management/Analysis**

Completed trail surveys were entered into a Microsoft Access database by the summer field assistant. A quality control check of the initial data entry was performed by the principal investigator. Use of a database made data entry simple and consistent and allowed for quick export to other software programs for analysis. Microsoft Excel was used to derive descriptive visitor statistics. NVivo 10 software was used to analyze the open-ended comments (Appendix D

- Question 10) and ESRI Arcview 10.1 software was used to analyze the trip destinations of users (Appendix D - Question 10).

### **3.3.2 Global Positioning System (GPS) Tracksticks/Survey Packages**

#### **3.3.2.1 Goals and Objectives**

Global Positioning System Tracksticks were included with trail surveys to create a survey package. The GPS survey packages were distributed at two staging areas (Rock Lake and Sulphur Gates) along with visitor information centres (except for Jasper National Park). Due to limited field staff and the unpredictability of trailhead visitation on any given day, Trackstick survey packages were mainly distributed at the Rock Lake staging area during weekends throughout the summer. Beginning in mid-July, GPS survey packages were also distributed intermittently at the Sulphur Gates staging area. The goal was to pilot and explore the utility of GPS Tracksticks within a rugged wilderness area. Specifically, the main objectives for using GPS Tracksticks were the following:

- a) to determine the general spatial patterns of visitors at Rock Lake and Sulphur Gates staging areas; and
- b) to examine the utility of GPS Tracksticks as a social science tool for visitor monitoring in outdoor recreation areas such as Willmore.

#### **3.3.2.2 Rationale**

The use of GPS technology was a simple and cost-effective method to collect geospatial and temporal information about individuals and groups. Some individuals are not experienced with using maps or are familiar enough with an area to determine their trip route or location. Distributing GPS Tracksticks to willing participants was a simple and fairly unobtrusive way to collect accurate spatial trip information. The user was not required to have prior GPS experience before they were provided a Trackstick. The units were preprogrammed in the office, so it was just a matter of turning the unit on and keeping it visible to the sky for clear satellite reception. Downloading the data was also quick and simple through a computer Universal Serial Bus (USB) and locations were easily viewed in software such as Google Earth.

### **3.3.2.3 Equipment**

Twenty-nine GPS Trackstick units were provided by Alberta Tourism, Parks and Recreation for use in this project. The GPS Trackstick model was the Super GPS Trackstick (Appendix E) which was developed by Telespial Systems Inc. GPS Tracksticks utilize satellite technology which enables the device to collect information such as location, time, date, temperature, speed, and direction. GPS Tracksticks were tested, settings were pre-programmed, and each Trackstick was labeled (with a unit identifier and a project phone number). Tracksticks were inventoried in database created in Microsoft Access. The Super Trackstick utilized two AAA batteries and was capable of holding four megabytes (MB) of flash memory. The Tracksticks were compact and measured 4 1/2" x 1 1/4" x 3/4" in size. The Super Trackstick had a clip, however upon testing, it was found that the clip was not sturdy and could easily be pulled off the unit. To provide different attachment options to the participant and to try to attach the unit so that it could have a clear view of the sky (to communicate with satellites), elastic bands, a Velcro strap, and a single carabineer was attached to each unit. The Trackstick distribution package contained the following: a project summary sheet, Trackstick instructions, an additional set of AAA batteries, trail survey/map (printed on waterproof paper), postage-paid/pre-addressed padded envelope (to mail back the GPS Trackstick), one pen, and two crayons. All of these items were contained within a labeled clear plastic re-sealable storage bag. Each GPS Trackstick was pre-programmed in the office prior to distribution and full power mode and fast track recording interval were selected.

### **3.3.2.4 Deployment**

Due to limited staff resources, project budget, and estimated low and dispersed visitation, it was not feasible to utilize a random sampling method for Trackstick package distribution. A convenience sampling methodology was utilized at the highest estimated use trailhead (Rock Lake). GPS Trackstick packages were distributed by a summer student to park visitors during weekends starting on July 1, 2010 until August 21, 2010. From mid-July to mid-September, GPS Tracksticks were infrequently distributed at Sulphur Gates staging area by a casual research assistant. Park visitors that were over the age of 18 were approached and greeted by the project staff member, introduced to the study, and were asked to provide their consent to participate in the study. If there was more than one person in a group, a volunteer from the group was selected. Trackstick packages were also available at the Hinton Visitor Information Centre, Switzer Park

Visitor Centre, and the Grande Cache Tourism and Interpretive Centre. Trackstick packages were dropped off at the Willmore Wilderness Foundation office in Grande Cache and also to three park users that were planning future trips into Willmore. Upon being assigned to a user, the unit identifier, participant's name, and phone number were recorded and a quick summary on how to operate the Trackstick device was provided. It was important to teach the participant how to turn the unit off and on (and how to determine if the unit was working properly). Upon trip completion, the Trackstick was returned into a locked trailhead kiosk drop box, or mailed back in a pre-paid envelope, or dropped off at one of the information centres mentioned above.

It should be noted there was a limited inventory of GPS Tracksticks available and this limited the number of survey packages that were available for distribution at a given time and location. The limited number of units was not an issue as park visitation at the Rock Lake and Sulphur Gates staging areas was dispersed throughout the sampling season.

#### **3.3.2.5 Issues/Limitations**

The main limitations of the GPS Trackstick were the following:

1. The ability to securely attach the Trackstick to the participant, their gear, clothing, or equipment, so that the unit remained visible to the sky. In some cases the Trackstick appeared to be carried inside a pocket or backpack where the unit was unable to acquire satellite locations. Some units were lost because they were not securely attached.
2. The user forgetting to turn the unit on or off or not having the unit turned on for the entire trip duration.
3. Power considerations (e.g., batteries on longer trips or the user not being comfortable changing batteries).
4. User intimidation (some people are afraid of technology and gadgets) or simply some people do not want to be tracked (e.g., sensitive locations, favorite hunting locations or secret camping spots etc.).
5. The cost (upwards of \$240.00 per unit). It is expensive to replace a lost or broken unit or to purchase a large inventory of units.

Other studies have identified challenges in obtaining GPS locations in specific terrain such as rugged terrain and thick vegetation (D'Antonio et al., 2010) however; this did not appear

to be an issue in this project. A larger sample size of successful tracks that were collected from a wider variety of terrain would need to be examined. In some cases, Tracksticks were returned but did not have an associated trail survey accompanying them. It was important to let users know that the Trackstick did not monitor their whereabouts in real time or act as an emergency device such as a SPOT Satellite GPS Messenger. For Trackstick data analysis, having a background in GPS and GIS assisted in the processing of the Trackstick data and the subsequent analysis. Though the tracks can be quickly viewed in Google Earth, a wealth of analysis capabilities can be potentially performed in software such as ESRI Arcmap.

### **3.3.2.6 Data Management/Analysis**

Upon receiving GPS Tracksticks from participants (i.e., drop boxes or information centres), the data was downloaded using the associated Trackstick Manager software version 3.1.1. Data from the unit was deleted, batteries were checked, and the unit was returned back to the inventory. Trackstick information was entered in the Trackstick database to monitor the inventory, distribution location, and status of the Tracksticks. Trackstick Manager was integrated with Google Earth, however for more advanced analysis and improved map creation, ESRI Arcmap 10.1 software was used to analyze and develop maps of the Trackstick locations. Please refer to Appendix F for the data processing steps that were used to bring the data into Arcmap. Individual GPS Trackstick files were reviewed in Trackstick Manager.

There were simpler options available to import the data into Arcmap, however the other methods generalized line features (e.g., the Arcmap points to line command). The Minnesota Department of Natural Resources (DNR) Garmin application had potential for use, however it struggled with exporting the lines as a shapefile and manual manipulation had to be carried out to preserve point attributes. After some experimentation, the most time-efficient steps were taken in order to avoid scripting in the Python programming language. General tracklog statistics were obtained including the track length from Arcmap, and the final tracklogs and points were merged and combined with other GIS layers (e.g., hillshade, trails, streams, etc.) to produce the final map products.

### **3.3.3 Trail Cameras**

#### **3.3.3.1 Goals and Objectives**

In order to determine visitation at the four main Alberta Willmore staging areas, Reconyx trail cameras were deployed on the main trail system at each of the four staging areas. The goal was to collect images that would be used to derive both human and animal (i.e., wildlife, dogs, and stock) information. Specifically, the main objectives to be addressed by using trail cameras at the four main Alberta staging areas were the following:

- a) calculate human visitation at staging areas through visit counts;
- b) determine visitor and trip characteristics;
- c) determine general temporal patterns of peak visitor use; and
- d) collect domestic animal (i.e., horses, dogs) and wildlife events.

A visit count was defined “as the total number of single-person visits made by people that enter (or leave) a given area during a specified time period, without regard for length of stay” (Watson et al., 2000, p. 10).

#### **3.3.3.2 Rationale**

Trail cameras were chosen as the study instrument to gather visitor numbers and characteristics for the following reasons: (1) the completion of trail surveys was voluntary so it was likely that some user types or individuals would not be captured through this instrument, (2) Willmore did not have a mandatory trail registration system for park users, so there was no way of knowing when visitors were arriving or departing for a trip, (3) it was potentially obtrusive and not financially feasible or practical to have trailhead observers at all four staging during all hours to count and census users, (4) cameras were more reliable and provided more detailed information than trail counters, (5) trail cameras were available for use from Alberta Tourism, Parks and Recreation which was cost-effective since equipment did not have to be purchased, (6) trail cameras could be operational seven days a week, 24 hours per day, and (7) required low resources to install and monitor. As mentioned, trail counters were considered but they appeared to be error prone and did not have the ability to identify whether a human or animal triggered the counter (unless one used a counter/camera combination unit). A small number of cameras were deployed in order to maintain as much park visitor privacy as possible. The main trail that



accessed each staging area was selected because visitors were either entering or exiting the park and these locations were not considered physical wilderness; but were instead access points into wilderness.

### **3.3.3.3 Equipment**

Four Reconyx RapidFire Professional PC85 Cameras (Appendix G) were provided for use in this project by Alberta Tourism, Parks and Recreation. The PC85 camera was motion activated and captured a digital photo upon being triggered by motion (i.e., an animal or person walking). Attributes including air temperature, date, time, and moon phase were collected as part of the image upon being captured by the camera. High quality rechargeable batteries were cycled through the cameras as a power supply. Two and four gigabyte (GB) Scandisk memory cards were cycled through the cameras at regular intervals. Please refer to Appendix H for specific camera menu settings. Python locks and cables were used to help secure the camera from theft. The use of cameras as a study instrument was confirmed just prior to the start of the field season as it was uncertain as to what equipment would be available.

### **3.3.3.4 Deployment**

Trail cameras were deployed at the main trails into the four staging areas beginning June 15<sup>th</sup>, 2010 and were removed starting December 3, 2010. Each camera was tested prior to field deployment to ensure proper set up and functioning. Communications and project messaging including the mention of cameras was posted at all of the staging areas on survey stations, on the Foothills Research Institute Willmore Project website, in local newspapers (*Jasper Fitzhugh*, *The Rocky Mountain Goat* (McBride, Valemount, and area) the *Hinton Parklander*, the *Hinton Voice*, and project information was mailed to major park operators or outfitters where an mailing address was available. Attempts were made to publish project updates in the *Grande Cache Mountaineer* in early July; however, the editor was unreachable until late August so an article was not published until late September when the editor was in touch. Each camera had an ATPR label so if the camera was located by a user, they would be informed that it was not a privately operated camera (e.g., hunting/game). An additional tag was fastened to the camera with an ATPR logo and a description stating the camera was for researching human and wildlife numbers and not to disturb or tamper with the camera. Cameras were mounted to a suitable tree location and secured to the tree with a cable and lock to help prevent theft or tampering.

### 3.3.3.5 Issues/Limitations

There are potential challenges associated with the use of trail cameras as a study instrument. These challenges include: under-counting (e.g., if an object is travelling too quickly to be detected by the camera), over-counting (e.g., the camera is triggered by an object such as vegetation moving back and forth in front of the camera), battery life (batteries need to be monitored and changed), data storage (the capacity of the camera's memory card or internal storage), the potential of people tampering, vandalizing or removing the equipment, and the possibility of camera deployment without the user fulfilling their moral or legal obligations (e.g., not storing the images securely, publishing photos of individuals without their consent, not destroying the images after a defined or required period of time etc.). In particular for this study, off-leash domestic dogs may have wandered while travelling with their owners outside the area of detection of the camera and may not have been counted. Off-highway vehicles (OHVs) may have been travelling too quickly and were not detected by the camera.

There are ethical and philosophical challenges that may arise through the use of trail cameras within public outdoor recreation areas such as parks. Certain methods of visitor monitoring can be viewed as an intrusion into the private sphere of a visitor (Arnberger & Brandenburg, 2005). This can be especially true, when a visitor is in remote wilderness and does not expect or want to be monitored through cameras or other tracking equipment. After all, many people visit areas such as this to escape the fast pace of modern technology. Alternatively, one may argue that wilderness parks are technically public spaces. There is no simple, right, or wrong answer to the suitability of using trail cameras in wilderness, so the best effort was put forth by the researcher in moral and ethical considerations. It is critical for users, prior to camera deployment, to understand existing policy and legalities in their region relating to the implementation of trail cameras, "image storage, analysis, and publication" (Meek, Ballard, & Fleming, 2012, p. 6). For the purpose of this project, a minimal number of cameras were deployed (i.e., the four main Alberta staging areas) and were not placed at campsites or directly in parking lots (i.e., in specific spots where people have an expectation of privacy). Anticipated ethical issues prior to the start of this project included privacy issues or concerns of the public in relation to their image being captured without prior consent. This project was reviewed and obtained research approval by Alberta Tourism, Parks and Recreation as well approval was obtained through the University of Alberta, Physical Education and Recreation, Agricultural Life

and Environmental Sciences and Native Studies Research Ethics Board (PER-ALES-NS-REB). Trail cameras were not intended for law enforcement purposes, however if an illegal act was inadvertently captured, there were inherent legal implications and moral obligations that could result. Project staff (i.e., student research assistants) were informed about the ethical considerations (image confidentiality, storage and access, etc.) that were posed by the use of the cameras prior to working with the camera equipment or before they began data management tasks with the camera images.

Careful consideration was given to the storage and access of the images. Images were securely stored in a network directory only accessible by project personnel. Images were not used for purposes outside of the project and would be subsequently destroyed. At the time of writing, Alberta Parks was formulating a directive to help guide the use of remote cameras within designated provincial protected areas.

A general limitation of trail cameras is the time requirement for detailed image analysis. The process can be laborious and costly to manually interpret the data (Kajala et al., 2007). The process often includes: reviewing, coding, analyzing, and presenting the results and this process is very time consuming. Though software can automate the image classification process, this project collected some unique attributes, so human interpretation and verification were required.

Though a variety of visitor and trip characteristics were determined through the coding of camera images, trip attributes such as the trip distance or trip route could not be determined. The coding of certain attributes (e.g., age category, activity, spot camera) was subjective in nature. Age categories were defined for child, adult, senior etc., but this was difficult to determine by an image alone and the judgment and coding of age may vary between image coders. Whether or not the person truly recognized the camera because they were looking in the direction of the camera cannot be determined with certainty through an image alone. However, if for example, the individual was observed in the images approaching the camera and examining it, then it was certain they had recognized the trail camera. In some instances, due to the image resolution, contrast, lighting, or the clothing and face visibility of the individual, it was not possible to determine the gender of the individual. It was possible to generalize trip type (e.g., day versus overnight) for individuals that were observed entering and exiting the same trailhead along with the presence of large backpacks and horses with pack boxes, but for individuals or groups that

exited or entered at a different trailhead, this may not have been accurately coded. If an individual was observed entering the trailhead with a large pack and was not observed exiting the trailhead within the same day, this was coded as overnight. If the individual was difficult to recognize, this could result in a coding error. Discerning between specific user segments was not possible. For example, stock counts were obtained through camera images, but it was not possible to determine commercial users from non-commercial. Activity types were generalized from images (e.g., a person carrying a fishing pole is fishing) but if the gear was not visible on the image, the activity may have been classified incorrectly or generalized. In addition, one activity was coded for each individual and an individual may have been participating in more than one activity or in an activity that was not visually apparent (i.e., their climbing gear is inside their backpack and was not visible etc.). In this study, individual human event summaries were calculated; however group sizes were not coded or calculated.

In this study, many users were accepting of trail cameras; however, one locally-based group was adamant against the use of cameras for capturing human use data. This was an example of how the use of cameras or other research instruments can introduce complexities with particular individuals or user groups. This group conveyed mixed messages expressing they were against cameras being used to collect human images, however supported their use for capturing wildlife. Remote camera technology has not evolved to the point where there a switch or menu settings to direct the camera to either collect human or wildlife images. Cameras capture images that result from object detection. This includes both humans and wildlife, and often where there is wildlife, there are humans and vice versa.

The group was provided project information at their head office, as well project information was posted on survey stations or trail kiosks at all four staging areas (along with researcher contact information), available through the Internet, and published in newspaper articles. After receiving a negative email from the group representative stating they did not support the project, an invitation was made to meet with the representative to clarify project objectives and to answer any questions. The invitation was not answered and articles and newsletters were published about the project and trail cameras based on misinformation. The articles did not affect response rates and visitor cooperation as they were published as the project was concluding. The group applied pressure on Alberta Parks to force the removal of the

cameras and issued complaints at a variety of levels. This did not affect the project (i.e., cause project delays or lapses in data collection) or force the removal of the cameras because the correct steps were taken prior to the commencement of this project (i.e., proper research approval was obtained through Alberta Parks and ethics approval was obtained from the University of Alberta). Perhaps trail cameras were not the main concern for this group, but rather an assertion as to who they felt really manages Willmore and associated park research.

### **3.3.3.6 Data Management/Analysis**

Images that were captured by the trail cameras were reviewed, coded, and entered into a Microsoft Access database by three project staff. This was an intensive process as each image had to be reviewed and humans and wildlife were coded into the database each time an individual event occurred. In the context of this study, similar to Duke and Quinn (2009) an individual event was defined as:

- an individual (object) human or animal;
- if the same object occurred across a series of sequential camera images, this object was considered a unique event;
- if it could be identified that the same object entered and exited an image numerous times within five minutes then it was considered a unique event: if the object remained out of the camera image for greater than five minutes, then it was considered a new individual event;
- each object was coded as individual event (e.g., if a horse with a rider were captured in one image, they were each coded as an individual event); and
- images containing project staff were not coded.

A five minute time period for an object to be considered a new event was adopted from Duke and Quinn (2009) and seemed like a reasonable amount of time for event categorization. (Please refer to Appendix H for the data dictionary for the trail camera database attributes that were coded from trail camera images). Once all of the images were coded, an initial quality control check was performed by the summer assistant. A final quality control check was completed by the principal researcher who reviewed all of the images and records that were coded. Additional data quality control checks were performed using Microsoft Excel. Descriptive statistics

summarizing human visit counts, domestic animal (i.e., horse and dog), and wildlife events were derived using Microsoft Excel.

### **3.3.4 In-Depth Mail Surveys**

#### **3.3.4.1 Goals and Objectives**

In order to collect more detailed information about Willmore visitors, self-administered, 11 page survey booklets (Appendix I) were mailed to trail survey participants that had indicated they were interested in additional information gathering. The goal was to gather more detailed visitor trip information, trip motivations, knowledge and familiarity of Willmore, visitors' place attachment, risk perceptions, management preferences, and detailed demographics. Specifically the main objectives of the in-depth survey were to determine the following:

- a) sources of trip planning information and advance trip planning time;
- b) visitor trip satisfaction;
- c) the most important trip motivations of visitors;
- d) the familiarity of visitors with Willmore;
- e) attachment level of visitors;
- f) management preferences and risk perceptions of visitors; and
- g) the socio-demographic profile of participants.

#### **3.3.4.2 Rationale**

In-depth mail surveys were selected as a study instrument as part of the mixed-methods approach in this study because it was a simple and cost-effective approach. It allowed for a variety of information to be collected from park users without burdening them at the main staging areas. The nature of the study instrument also allowed the participant to complete the survey when it was convenient for them. Since in-depth surveys were only mailed out to those who were interested in participating in additional information gathering it was hoped that participants were interested in investing their time and effort in completion of the survey.

#### **3.3.4.3 Equipment**

An in-depth (11 page) survey was designed by the principal investigator with input from the thesis graduate committee and other reviewers. The survey was professionally printed as a double-sided black and white survey booklet including a survey cover page (Appendix I). In-

depth survey packages included an envelope to mail the package in, and the package itself which consisted of a postage-paid and pre-addressed return envelope, a project cover letter, a draw entry card, and the survey booklet. Pre-notice letters were printed in color and reminder post-cards were professionally printed. In-depth surveys were linked to the trail survey through a survey number which was handwritten in the survey code box on the first page of the survey. A survey number was also listed on the address label of the return envelope.

#### **3.3.4.4 Deployment**

In-depth surveys were deployed following the *Internet, Mail, and Mixed-Mode Surveys: The Tailored Design Method* (Dillman, 2009). The method consisted of a pre-notice letter notifying the participant that an important survey would arrive within a few days, the initial survey package, a reminder post-card, followed by a second reminder survey package if the first survey was not received within a month of first mailing it. A final attempt was made in some cases through a third (last-straw) survey package. Pre-notice letters were mailed out November 3-4, 2010 followed by in-depth survey packages on November 9, 2010. An individual was permitted to complete one in-depth questionnaire for the 2010 season. Prize incentives to help encourage respondents to complete the survey were donated by the Switzer Park Visitor Centre (one \$100.00 Robert Bateman print, two \$20.00 t-shirts, and two \$50.00 gift cards from Cabellas and Mountain Equipment Co-op). These were included in a draw, which was conducted on April 15<sup>th</sup>, 2011 and prizes were mailed out shortly thereafter.

#### **3.3.4.5 Issues/Limitations**

Potential challenges associated with the in-depth questionnaire were similar to the issues and limitations discussed in this section pertaining to self-administered trail surveys. In addition, the opportunity for a user to complete an in-depth survey was associated with the user having completed a trail survey. If the user hadn't completed a trail survey and provided their contact information, then there was no opportunity to participate in the mail survey component. Although mail surveys have much potential, there are a variety of errors which may reduce the accuracy of mail survey results which include: (1) using a non-representative sampling frame, (2) respondents providing socially acceptable responses rather than their true thoughts and information, (3) data entry and coding errors, (4) inappropriate interpretation, and (5) response

bias between those who completed a survey and those who did not (i.e., views would differ between those who completed the survey and those who did not) (Crompton & Tian-Cole, 1989).

It was likely that in-depth survey participants were not a representative sample of all Willmore users. If a participant was mailed an in-depth survey, completion of the survey was reliant on the respondent's initiative, time, and commitment. Some surveys were not completed in their entirety most likely due to the survey length, potential disinterest, or lack of time since the survey was eleven pages long. It was also possible that respondents obtained information about Willmore through the Internet or publications for the knowledge and familiarity section of the questionnaire. If this were the case, then knowledge and awareness levels may be higher than what would have resulted if users were interviewed in-person and did not have the opportunity to obtain additional knowledge through research. This limitation is not an entirely negative, because through their potential research for answers to the park knowledge questions, they were most likely learning new information which was beneficial.

#### **3.3.4.6 Data Management/Analysis**

Deployment information (i.e., date survey mailed, received back, etc.) for in-depth surveys was tracked in a secure Microsoft Access trail survey database. The Statistical Package for Social Sciences (SPSS 20) software was used for data analysis of the completed surveys. Survey data was entered into SPSS by a summer student and surveys were quality control checked by the main researcher to insure data integrity. Descriptive statistics were derived from the questionnaire data using SPSS and Microsoft Excel 2010 software was used to create final summary tables and figures from the SPSS outputs.

#### **3.3.4.7 Appropriateness of Data Collection Strategy**

Because backcountry wilderness use is so highly variable, spread-out, and occurs generally in low numbers, the selection of an appropriate study design can be a challenge. To address this challenge, the combination of the self-administered trail survey, in-depth mail questionnaire, and trail cameras were selected because it was an effective approach in addressing the "elusive" characteristics of the wilderness visitor in Willmore. The availability of existing study instruments (i.e., trail cameras) and limited resources also contributed to the decision to use a mixed-methods approach. Because there was no user registration system for Willmore, it



would have been difficult to know if or when users were arriving or departing on a particular day if in-person surveys were planned.

### **3.4 Qualitative Data Collection**

#### **3.4.1 Interviews**

##### **3.4.1.1 Goals and Objectives**

In order to gather information to help gain additional insight related to place meanings, interviews were used as an additional project study instrument. Interviews with Willmore users (horse riders, outfitters, hikers, bikers, etc.) who ranged in age, gender and residential proximity, were conducted to explore park users' relationship with the Willmore Wilderness Park. Specifically the main objectives included learning about users':

- a) sensing of Willmore and stories of place;
- b) place history (frequency of use, length of affiliation, etc.) associated with Willmore;
- c) emotions and feelings related to Willmore;
- d) perspectives on use and stewardship of Willmore; and
- e) evaluations of and preferences for Willmore.

##### **3.4.1.2 Rationale**

Interviews were chosen as a study method because it was thought that a qualitative understanding of place meanings would complement the visitor information derived from the quantitative study instruments. In addition interviews provided an opportunity to gather information from Willmore users that may not have completed or were not interested in completing a trail survey and/or subsequent in-depth survey. In addition, interviews provided participants more options in their responses and the researcher an opportunity to be flexible with the interview questions. This resulted in opportunities to investigate new or unexpected findings and better gauge individual differences.

##### **3.4.1.3 Interview Selection and Sampling Frame**

Interview participants were selected through a snowball sampling method (Bernard, 2005). That is participants were identified through a variety of methods including *word of mouth*, recommendations by colleagues, friends, interview participants, etc. The goal was to aim for a minimum of 15 interview participants while balancing the available time and budget. It was also

important to ensure that enough information was gathered from the number of participants interviewed. An attempt was made to select participants that represented a variety of user groups, age categories, and place of residence. To assist with this, a chart was created to monitor the characteristics of participants. It was not possible to interview every combination of user, but an effort was made to attain a varied representation of Willmore users. Prior to the interview taking place, a consent form was provided to the participant. Where possible, participants were interviewed in-person. In cases where travelling to meet a participant in-person was not possible, telephone interviews were conducted through Skype calls or through the telephone. In one instance, the participant was not confident in their English grammar and requested to be emailed the interview questions so that they could write out their responses in English. In total, 17 participants were interviewed. This included 11 in-person interviews, four Skype/Telephone interviews (including one double interview with two people), and one interview conducted in writing. It should be noted that one Skype telephone interview was a double interview (that is two people were interviewed on one phone call as they preferred being interviewed together). Potential interview candidates were contacted in most cases by phone and in some cases by email to determine if they were interested in participating. Where possible, an information sheet about the project and interviews was emailed or mailed to the participant ahead of time. Participants were required to review and complete an interview consent form and were encouraged to ask any questions about the interviews prior to the interview. Three attempts were made to schedule an interview with a potential participant. If scheduling an interview went beyond three attempts, then the next candidate on the list was pursued in order to keep the interview schedule on track.

#### **3.4.1.3.1 Nature of the Interviews**

A semi-structured approach was taken in the creation of the interview guide (Appendix K). This was to provide some structure to the interview but also to allow for flexibility to explore thoughts and ideas when required. Interviews began June 14, 2010 and were completed in September 2010. Most interviews lasted 45 minutes to one hour in length, though one interview was as short as 35 minutes and one interview extended over three hours. The researcher travelled to meet with participants where possible and met either at the participant's home, work place, or a quiet public location. If the participant provided consent, the interview was taped on two audio recorders (one was for backup) in order to ensure accuracy of the information and to reduce note-

taking which allowed for improved exploration and discussion. One interview participant was not comfortable with electronic recording devices so the interview was not recorded. Skype interviews used the calling feature of Skype to call participants. This also allowed for the interview to be recorded through CallBurner software and also on an audio device as backup. CallBurner software works in collaboration with Skype software. Telephone interviews were recorded on two audio devices. For the mail interview, the questions were mailed to the participant because they lived a far distance away and English was a second language. The written responses to the interview questions were mailed back to the researcher.

#### **3.4.1.4 Issues/Limitations**

A potential limitation of the in-person interviews was that one interview was held with each participant. This may not have allowed ample enough opportunity to have formed a relationship with the participant. Seidman (2006) suggests scheduling an initial contact visit before the actual interview to aid in the selection of participants and to enhance the foundation of the interview relationship. There was also the potential for participants being nervous that their interview was being audio recorded. The audio devices were small and unobtrusive so the researcher does not feel that this interfered with the interviews but it is something to consider. One participant was not comfortable with the use of the audio recorder so this interview was more challenging to conduct because thorough notes were recorded during the interview which can be distracting. Limitations with a Skype (without video) or phone interview included not being able to observe body language or facial expressions. For the written interview, possible limitations were not being able to observe body language or being present to help clarify thoughts or questions. For the double-interview, the researcher was cognoscente of managing the interview as best as possible so that the thoughts and ideas of one participant did not guide or influence the thoughts of the second participant. In general, the question of how many participants to interview bears consideration and not interviewing “enough” participants can be an issue. There was a balance between interviewing a representative sample and also keeping the project manageable. It was not possible to interview everyone that was interested in participating. Seidman (2006) describes two criteria for determining how many participants one should have in their study sample which includes sufficiency and saturation. Sufficiency relates to questioning if the number of participants reflects the range and location of participants that form the population (Seidman, 2006). Saturation refers to the point in the study where the

researcher is not learning anything new. This also depends on time and resources available along with other project-specific factors. For Willmore interviews, the researcher is content that an acceptable number of participants were interviewed. Though interviews can produce a rich dataset, the analysis of qualitative data can be arduous (Basil, 2003). Therefore, an additional limitation was extensive data review and analysis. Electronic methods for data coding were possible using software such as NVivo software (which was used in this study), however the analysis component still required much time and effort.

#### **3.4.1.5 Data Management/Analysis**

Audio files from the interviews were professionally transcribed. The only exceptions were one in-person interview that was transcribed by the researcher (because the participant did not want to be recorded) and one hand-written interview. The transcription document was then reviewed by the researcher for accuracy and to fill in any missing transcription while listening to the audio recording. This aided in becoming familiar with the interview content. Participants' responses used in this thesis were not corrected for grammar with the exception of a few cases (e.g., chapter quotes). This was to maintain their original context and meaning.

The next step entailed thoroughly reviewing all of the interview content and finding common themes between the participants' interview data. The methodology chosen to analyze the interviews followed Braun and Clarke's (2006) six phases of thematic analysis. These phases included: (1) Becoming familiar with the data, (2) developing initial codes, (3) searching for themes, (4) reviewing the themes, (5) defining and naming themes, and (6) producing the report (Braun and Clarke, 2006). According to Braun and Clarke (2006) "thematic analysis is a method for identifying, analyzing, and reporting patterns and (themes) within data" (p. 79). Progressing through the phases was an iterative and time intensive process. Interview files were imported into NVivo 10 software to assist with the data coding for themes.

## 4.0 RESULTS AND DISCUSSION

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*“My son asked me what I’m going to do when I retire and said I’m going deeper into the wilderness” - Ana*

## 4.1 Quantitative Results

This chapter summarizes and discusses the results obtained from both the quantitative and qualitative data collection components of the project. The results and discussion from the quantitative analysis are first presented followed by the findings from the qualitative analysis.

### 4.1.1 Trail Cameras

#### 4.1.1.1 Event Summaries

Four trail cameras at the main Alberta staging areas for Willmore, were operational between the dates of June 15, 2010 and December 6, 2012. This resulted in a total of 15,717.4 hours or 654.9 days of image data collection (Table 3).

**Table 3. Operating Times for Trail Cameras**

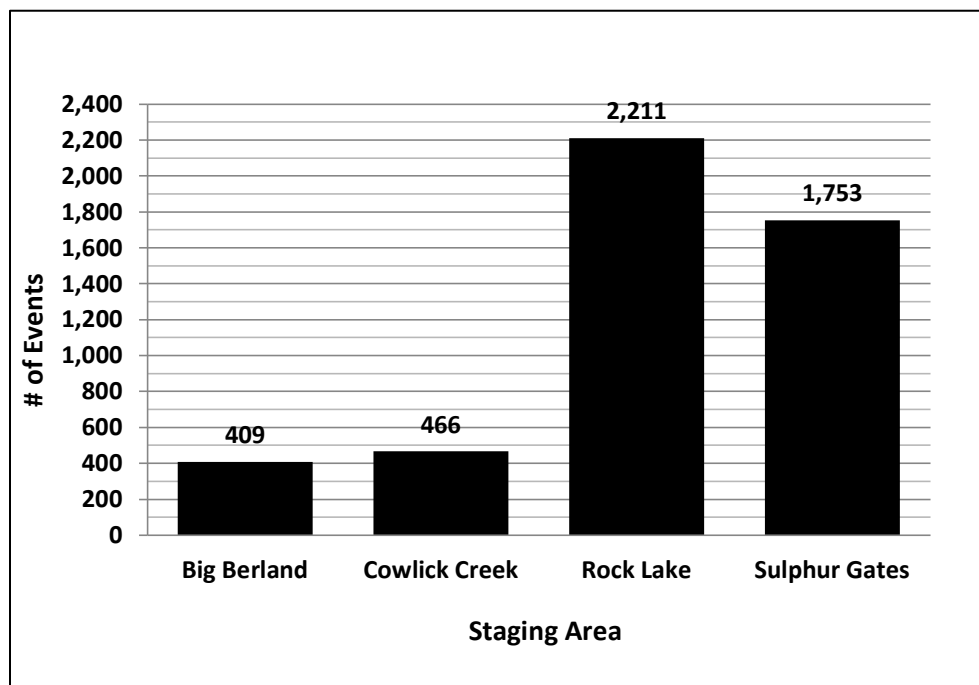
Staging Area	Time Operational (Hours)	Time Operational (Days)
Big Berland	4,005.6	166.9
Cowlick Creek	4,033.2	168.0
Rock Lake	4,079.1	170.0
Sulphur Gates	3,599.5	150.0
<b>Total</b>	<b>15,717.4</b>	<b>654.9</b>

*Note.* Sulphur Gates camera was missing 18.9 days of data due to human tampering.

No technical difficulties (e.g., data storage capacity or power issues) were encountered, however the Sulphur Gates trail camera experienced human tampering (turned backwards and the lens was covered with tape) on August 9, 2010. This resulted in 18.9 days of lost data. Fortunately the camera was not damaged or stolen. It is important to note the missing data for Sulphur Gates will affect final calculations throughout this entire camera results section. The camera tampering occurred during August which was considered to be a high-use month for visitation. Because the trail cameras in this study were operational for a short time period and there were no camera data collected in previous years to extrapolate potential visitation from, the data loss was very unfortunate. All summaries that incorporate data from Sulphur Gates will be lower than actual because of the missing data. As described on page 66, an event is an individual (object) human or animal. This section will summarize domestic animal events (e.g., horse and dogs) as human events are summarized as visit counts in the upcoming section. Domestic animals are those receiving care or sustenance from humans and accompany or are associated with park visitors (Sime, 1999). Domestic animals such as horses and dogs may extend the zone of influence for

human activities through being an additional agent of disturbance (Sime, 1999). Please refer to Appendix L for a tabular summary of all animal species (i.e., wildlife and domestic) events detected at the four main Willmore staging areas.

Horses are an integral component of Willmore. They are a major mode of transport in the backcountry for both people and gear and they have been present throughout much of Willmore's rich history alongside early inhabitants and explorers of the park. Present-day, horses are strongly tied to human use within the park. Where there are horses, there are people. The total number of horse events for all Willmore staging areas totaled 4,839. Rock Lake staging area had the highest number of horse events when compared to other staging areas (Figure 3).

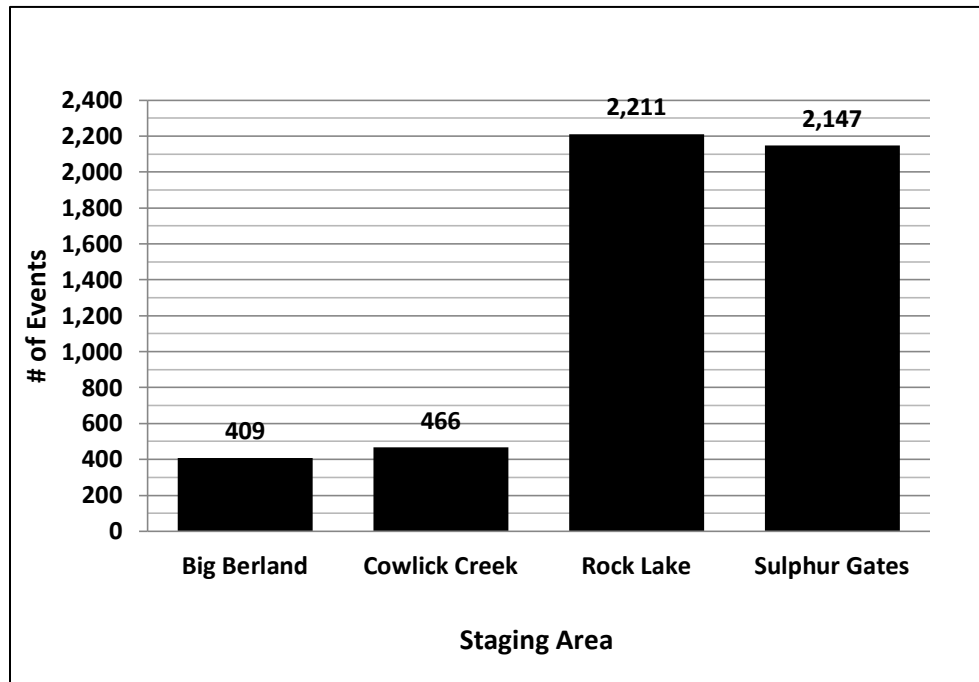


**Figure 3. Total Horse Events for Each Willmore Staging Area**

*n* = 4,839. Horse events also include mules.

Total horse events were lower than actual because Sulphur Gates was missing 18.9 days of camera data. It was speculated that if there was no missing data due to camera tampering, the total number of horse events would have been higher. How to address missing data related to trail cameras, especially ones that were monitoring human use, was not documented in the literature. Data loss is important to consider as it is likely either through equipment malfunction or wildlife damage (e.g., animals chewing the camera) and human tampering. To explore this speculation extrapolated values were derived from a straight-line extrapolation of existing data points in Microsoft Excel. In Excel a line connects the last value which contained the first full

week of available data prior to tampering and connected it to the next value which consisted of the next full week of available data. The three values were added together that were derived from the extrapolated line. These values were added to the total number of horse and dog events that had the missing data values. It should be noted that the extrapolation was to aid in providing insight into what the total number of events could have looked like without camera tampering. The extrapolated results are shown in Figure 4.



**Figure 4. Total Horse Events for Each Willmore Staging Area with Extrapolation**

*n* = 5,233. Horse events also include mules.

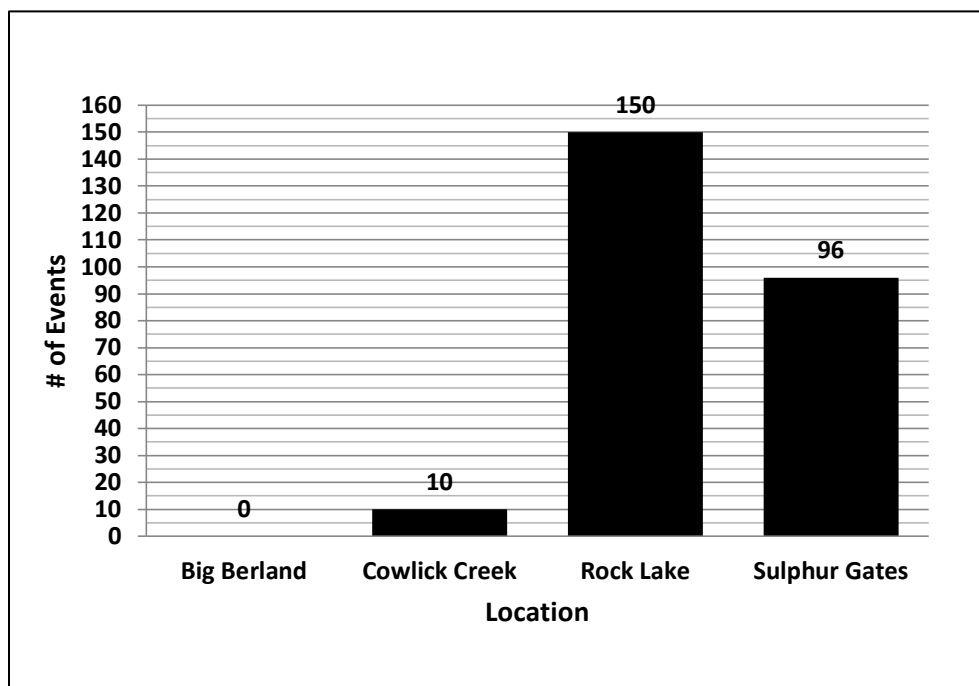
Rock Lake remained with the most horse events across all staging areas; however, the gap between Rock Lake and Sulphur Gates decreased with the addition of the extrapolated data values (Figure 4). In past Willmore studies, it was difficult to gather accurate horse numbers. Numbers were either gathered from self-registration surveys, backcountry guardian reports, patrol staff observations, or CTR seasonal trip estimates or summaries. As will be discussed in an upcoming section, there was often low self-registration by stock users and inconsistent seasonal trip summaries for CTRs. Other commercial horse use has not been tracked and documented and has either been under-represented or not represented at all in past studies and reports. Trail cameras were a valuable tool for gathering counts for horses both entering and exiting the park at staging areas.



Gaining insight into packstock (e.g., horses and mules) numbers is important because even low levels of packstock use can lead to substantial environmental impacts (McClaren & Cole, 1993). Potential environmental impacts include: wilderness vegetation, soils, water, wildlife, aesthetics (i.e., overgrazing, trampling, waste), and interactions with both wildlife and park visitors (McClaren & Cole, 1993). Much of these impacts can be attributed to when packstock are confined to the vicinity of a camp and when they are grazing. Supplemental feed for stock (e.g., hay) can potentially introduce non-native plant species which can be difficult to manage. Packstock such as horses can carry in larger amounts of gear into the backcountry including a wood-stoves, chain-saws, and axes. The quest for wood as a source of fuel for wood stoves or camp fires can lead to the removal of dead and live trees for fuel surrounding camping sites, thus enlarging the area of camping activity (Dawson & Hendee, 2009). Though horses are an integral component of the wilderness, it is important to develop and maintain a monitoring system for stock and associated grazing in order to monitor trends and change in those trends. A program was developed by Alberta Sustainable Development to review range conditions and potential impacts of horse and human activity in 2001. The results were input into a database and a rangeland resource map was created. Future human use information will be critical in helping to determine sustainable stock indicators.

Often, visitors in many protected areas including Willmore are accompanied by their dog(s) on their trip. These travel companions provide enjoyment; however, they may also disturb, harass, displace, or cause direct mortality of wildlife (Sime, 1999). They may also cause other problems including conflict with stock (e.g., horses) and other dogs when not kept under control (i.e., on a leash or under direct control such as voice command) (United States Department of Agriculture, n.d.). Dogs may also annoy or frighten other visitors. Dog presence has been shown to disrupt particular wildlife species (Sime, 1999). Some of the challenges associated with dogs have resulted to some protected areas restricting the presence of dogs in backcountry areas with sensitive wildlife species such as caribou. For example, dogs are not permitted in backcountry areas in Jasper National Park that are considered important caribou habitat in order to protect caribou which have declined in numbers over the past 50 years. In Willmore, there are currently no restrictions on bringing dogs into the park and this may be an additional attraction to Willmore for some visitors since many popular hiking areas within Jasper National Park are closed to dogs (e.g., Skyline Trail, Tonquin Valley, etc.). Other areas have

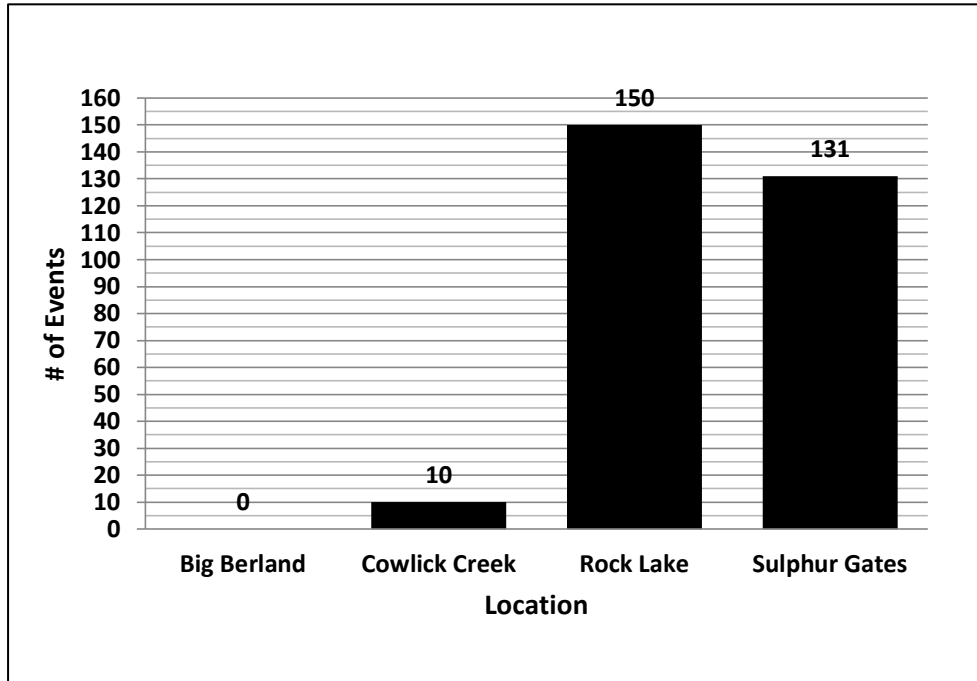
restricted dogs only during certain times of the year (i.e., nesting seasons). There is variation in agency response, rules, and regulations pertaining to domestic dogs between sites (Sime, 1999). In Willmore, 5% of visitors travelled with domestic dogs. The total number of dog events across each staging area was not substantial and therefore did not appear to be a concern (Figure 5). If visitation were to increase along with the associated number of dogs and conflicts were to arise with other dogs, people, and wildlife then perhaps dogs within Willmore would be a concern. Total dog events by each staging area are summarized in Figure 5. Rock Lake had the highest number of dog events while there were no dog events captured at the Big Berland staging area (Figure 5).



**Figure 5. Total Domestic Dog Events for Each Staging Area**

*n* = 256.

As described previously, Sulphur Gates was missing 18.9 days of data, so a straight-line extrapolation was applied using the same process as described for horses. The result of extrapolated dog events by each staging area is summarized in Figure 6. Rock Lake remained with the highest number of dog events; however, the gap between Sulphur Gates was reduced.



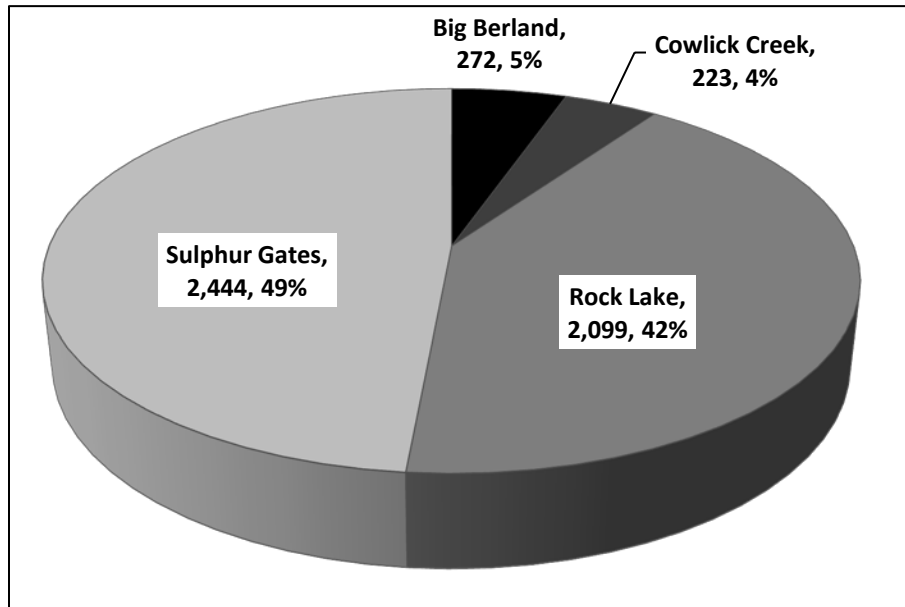
**Figure 6. Total Domestic Dog Events for Each Staging Area with Extrapolation**

*n* = 291

#### 4.1.1.2 Individual Visit Counts for Humans

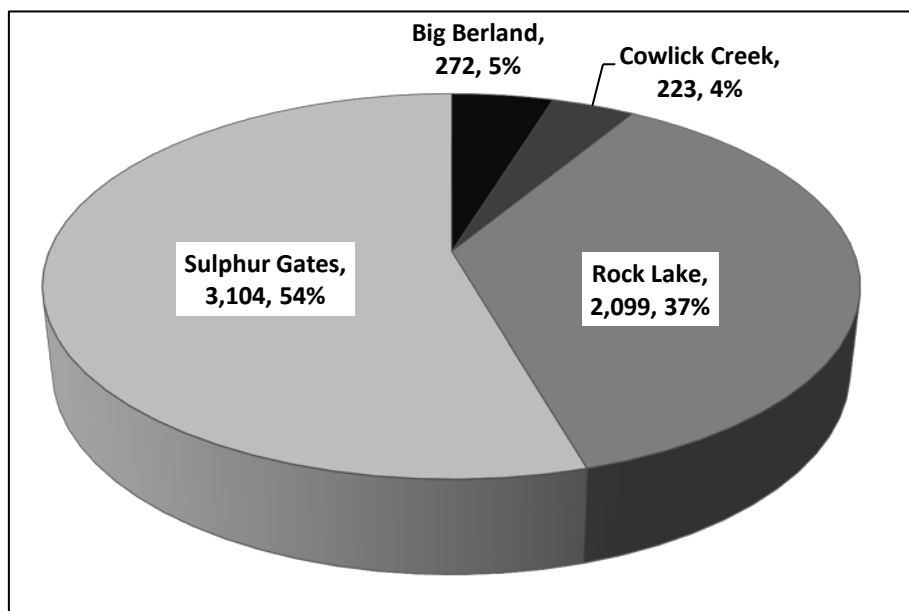
As defined on page 61, a visit count was defined “as the total number of single-person visits made by people that enter (or leave) a given area during a specified time period, without regard for length of stay” (Watson et al., 2000, p. 10). The total number of individual visit counts to Willmore was 5,038. The summer of 2010 had wet and cool weather, however weather data from locations near Willmore was limited and difficult to obtain to compare to previous summers. Water levels were high into September 2010 so this could have affected visitation. The greatest total number of human visit counts (2,444) occurred at the Sulphur Gates staging area, followed by the Rock Lake staging area (2,099) (Figure 7). Big Berland and Cowlick Creek staging areas both had low individual visit counts (Figure 7). These two staging areas may have been less well-known or less marketed to park visitors, and had less staging area amenities in comparison to Sulphur Gates and Rock Lake staging areas. According to Dawson and Hendee (2009), publicity in national U.S. publications (e.g., magazines and guidebooks) has resulted in certain wilderness areas and specific wilderness trails becoming popular. There appeared to be sparse information available to potential Willmore visitors (i.e., through the Alberta Tourism, Parks and Recreation website) and there were few official publications about Willmore. There

were however, some websites created by park users that may have acted as the main reference sites for gathering information about Willmore. Some information about Willmore was available through information centres (e.g., Hinton, Switzer Park, and Grande Cache Visitor Information Centres). Maps of the park are available, though these maps were not always in stock at information centres or were easy to obtain. It was possible that a particular staging area was



**Figure 7. Total Visit Counts for Individual Staging Areas**  
 $n = 5,038$ . Only human events are included in visit counts. Sulphur Gates camera was missing 18.9 days of data due to human tampering.

more difficult to access compared to another or it may not have provided access or easy entry to more desirable or popular areas of the park. Roggenbuck and Lucas (1987) found the popularity of staging areas and their associated trails were related to the type and degree of wilderness access that they offered. Similar to total events, values from the straight-line extrapolation of human events were applied to visit counts for humans (Figure 8). Sulphur Gates remained the highest use staging area; however the gap increased between Rock Lake visit counts with the extrapolation. As summarized in the preceding section, the highest number of horse and domestic animal counts was at Rock Lake, followed by Sulphur Gates. The highest human use staging areas appeared to have the highest domestic animal counts.



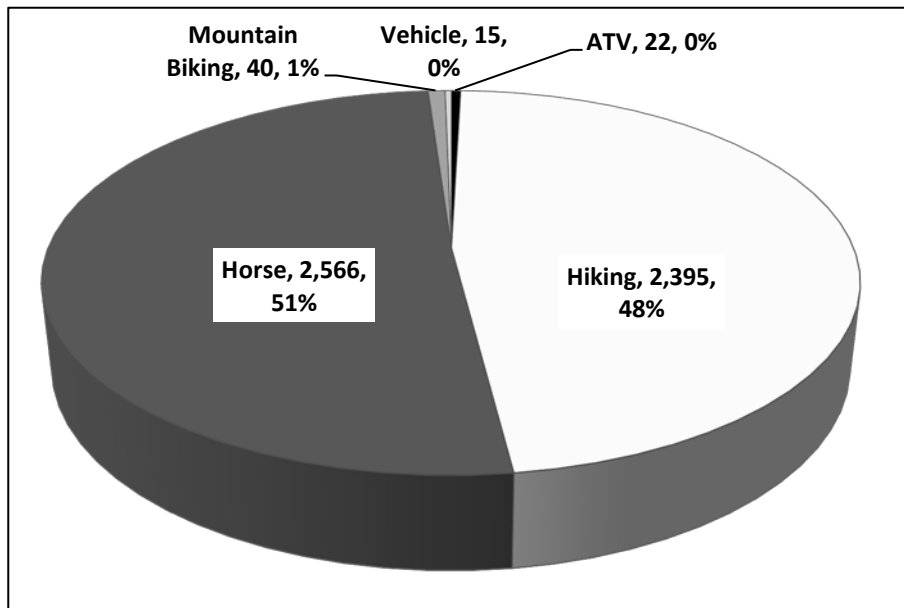
**Figure 8. Total Individual Visit Counts for Each Staging Area with Extrapolation**

$n = 5,698$ . Only human events are included in visit counts. Sulphur Gates camera was missing 18.9 days of data due to human tampering.

#### 4.1.1.3 Visitor and Visit Characteristics

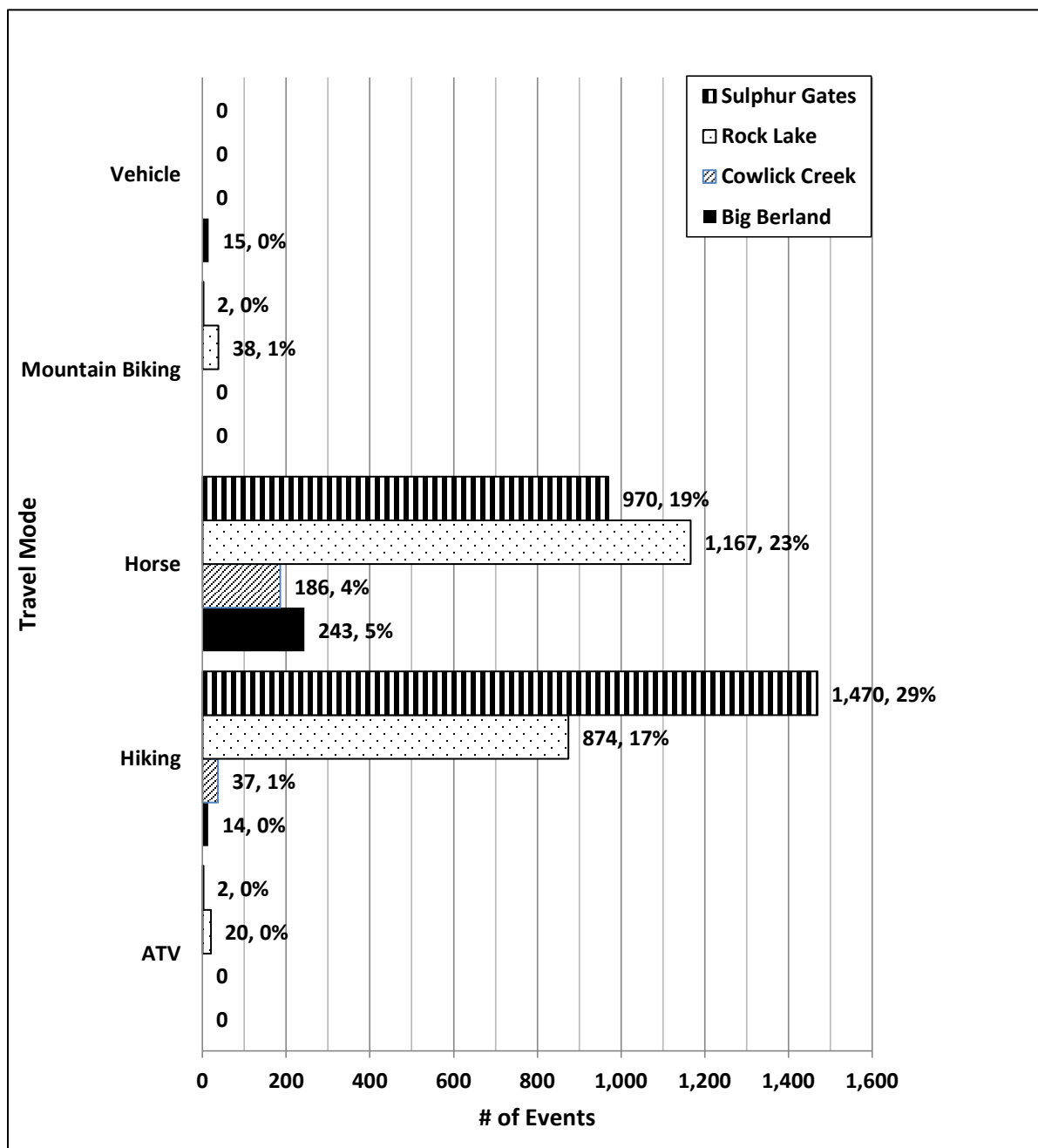
##### 4.1.1.3.1 Travel Mode

According to Watson et al. (2000), hiking was the most common method of wilderness travel mode, though other activities such as horse riding, rafting, and canoeing may approach or surpass hiking. The most common travel mode present at the Willmore staging areas was horse, closely followed by hiking (Figure 9). Other travel modes included: mountain-biking, horse and wagon, motorized vehicles, and OHVs. From these results, Willmore appears to be an important park for both hiking and horse-related activities. Extrapolations were not applied to travel mode calculations. When examining travel modes for individual staging areas, Sulphur Gates was the most popular staging area for hiking (Figure 10). At Rock Lake, horse was the most popular mode of travel, though the gap between hiking was not substantially large (Figure 10). As mentioned previously, the Sulphur Gates camera was missing a large proportion of data. It can be speculated what this additional data would have revealed if it had not been lost. There was a fairly large gap between hiker and horse counts for travel mode at Sulphur Gates. If this trend had continued, hiking would have surpassed horse as a mode of travel across all staging areas.



**Figure 9. Travel Mode Summary for all Willmore Staging Areas**

$n = 5,038$ . Sulphur Gates camera was missing 18.9 days of data due to human tampering. There is no motorized use allowed in Willmore with the exception of off-highway vehicles (OHVs) used by registered trappers during permitted times of the year or by park personnel. Other OHV use would most-likely be illegal if it were not one of these two user groups, with the exception of the Big Berland camera which was located on crown land (which permits motor vehicle access). Hiking activity can also include walking or trail running.



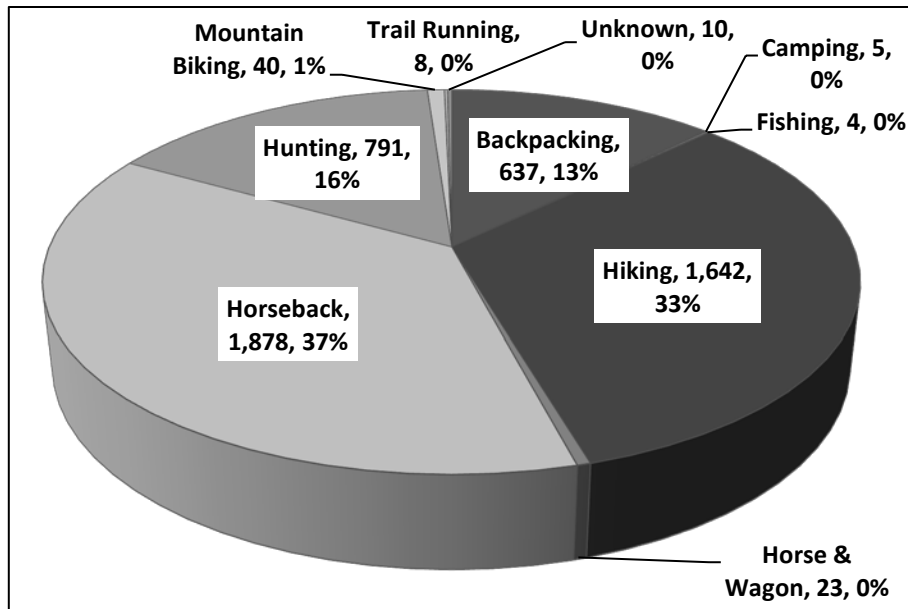
**Figure 10. Travel Mode for Individual Staging Areas**

$n = 5,038$ . Sulphur Gates camera was missing 18.9 days of data due to human tampering. Motorized use is not permitted in Willmore with the exception of off-highway vehicles (OHVs) used by registered trappers during permitted times of the year or by park personnel. Other detected OHV use would most-likely be illegal with the exception of the Big Berland camera which was located on crown land (which permits motor vehicle access). Hiking activity can also include walking or trail running. Percentages are rounded.

#### **4.1.1.3.2 Activity Types**

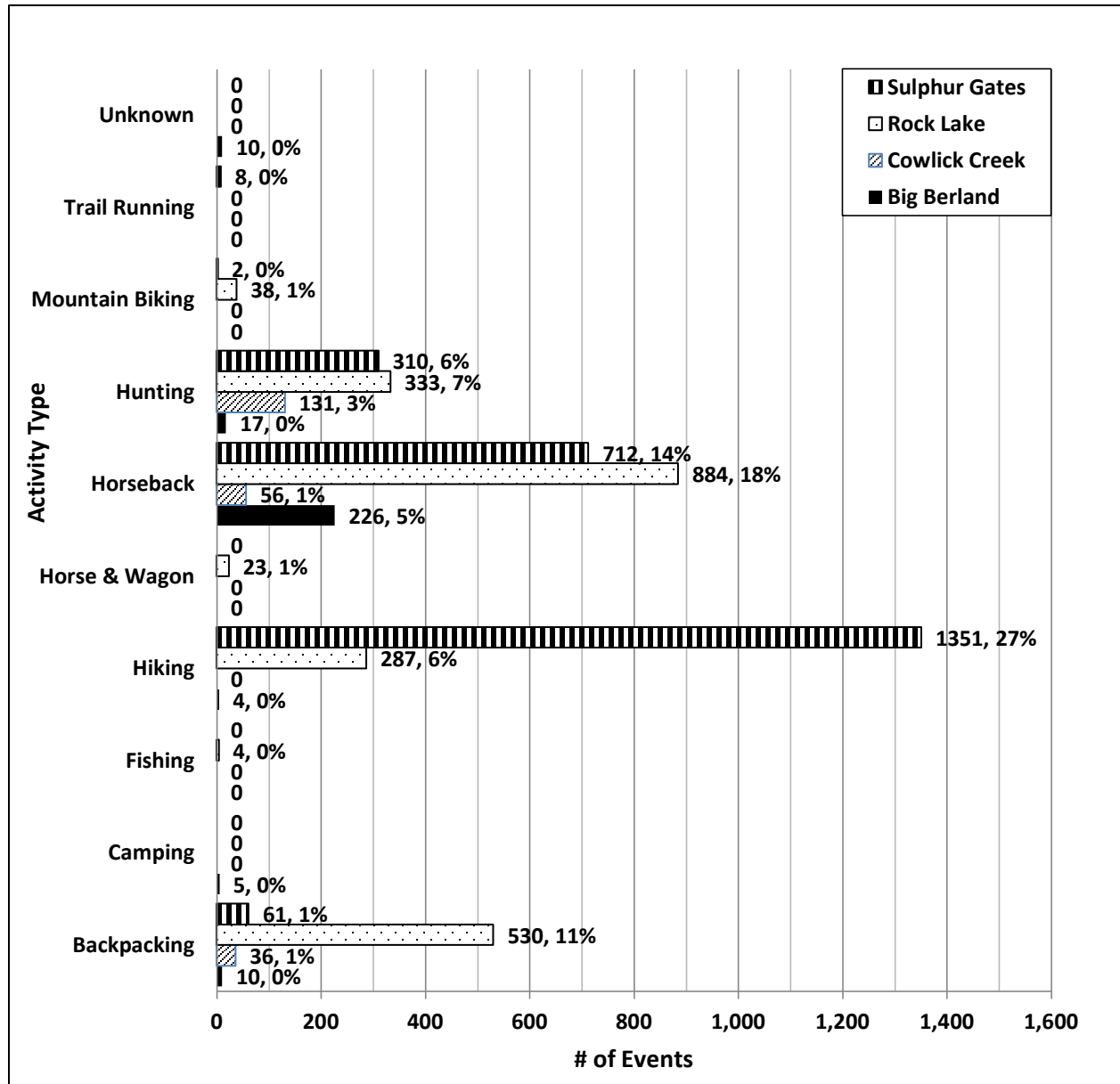
The main activities derived from the camera images revealed that the majority of Willmore staging area activities were centered on horse and hiking activities however, other activities included: hunting, fishing, trail running, mountain-biking, horse and wagon, and backpacking (Figure 11). For example, hunters either used horses or hiking as a mode of transport whereas their main activity was to go to Willmore to hunt. Assigning an activity through trail camera image classification generalized the activity based on the gear that was visually present to the image coder and was therefore subjective. Assumptions were made about the activity visible in the image and therefore may not be accurate. However, generalized activities have the potential to provide informative information. For example, hunting was assigned as an activity from images where a rifle was present or where hunting gear and apparel were observed (e.g., camouflage clothing etc.) during hunting season. This may have been misleading because some people may have worn camouflage clothing, but may not have been hunting (or may have been carrying a rifle for safety reasons). In addition, individuals may have appeared to be hiking but could have been heading in to meet a hunting group that had already transported their gear and clothing to camp. It may have been possible that visitors were participating in more than one activity on their trip. This would not have been captured by the image coding procedure where only one activity was coded for a human event. For example, hunters that were hiking may have been coded as hunters or hikers vice-versa. Day hikers were coded as hikers and were observed exiting the trailhead within the same day; backpackers were hikers that were not observed exiting on the same day. Many backpackers also had large day packs; however, this was not always an accurate indicator. Please refer to Appendix H for a detailed description of trail camera coding attributes. For individual staging areas, Rock Lake was the most popular staging area for horse riding and backpacking (Figure 12). Hiking was the most common activity at the Sulphur Gates staging area (Figure 12). Horse and wagon was an activity that is only possible at the Rock Lake staging area and the beginning of the Big Berland staging area trail (where there are no major river crossings). Horse and wagon activity was only recorded at the Rock Lake staging area. Horse and hunting were the dominant activities at the Cowlick Creek staging area (Figure 12). The most popular activity at Big Berland was horse-related (Figure 12).





**Figure 11. Summary of the Main Activities of Willmore Users**

$n = 5,038$ . Sulphur Gates camera was missing 18.9 days of data due to human tampering. Activities were coded from images where obvious gear, equipment or apparel was present (e.g., if a fishing rod was present, then activity was coded as fishing). Backpacking was discerned by a large pack whereas hiking was discerned by a lack of pack or what was determined to be a small backpack. Camping was coded at Big Berland because the camera was located outside the park boundary and occasionally truck campers were captured.

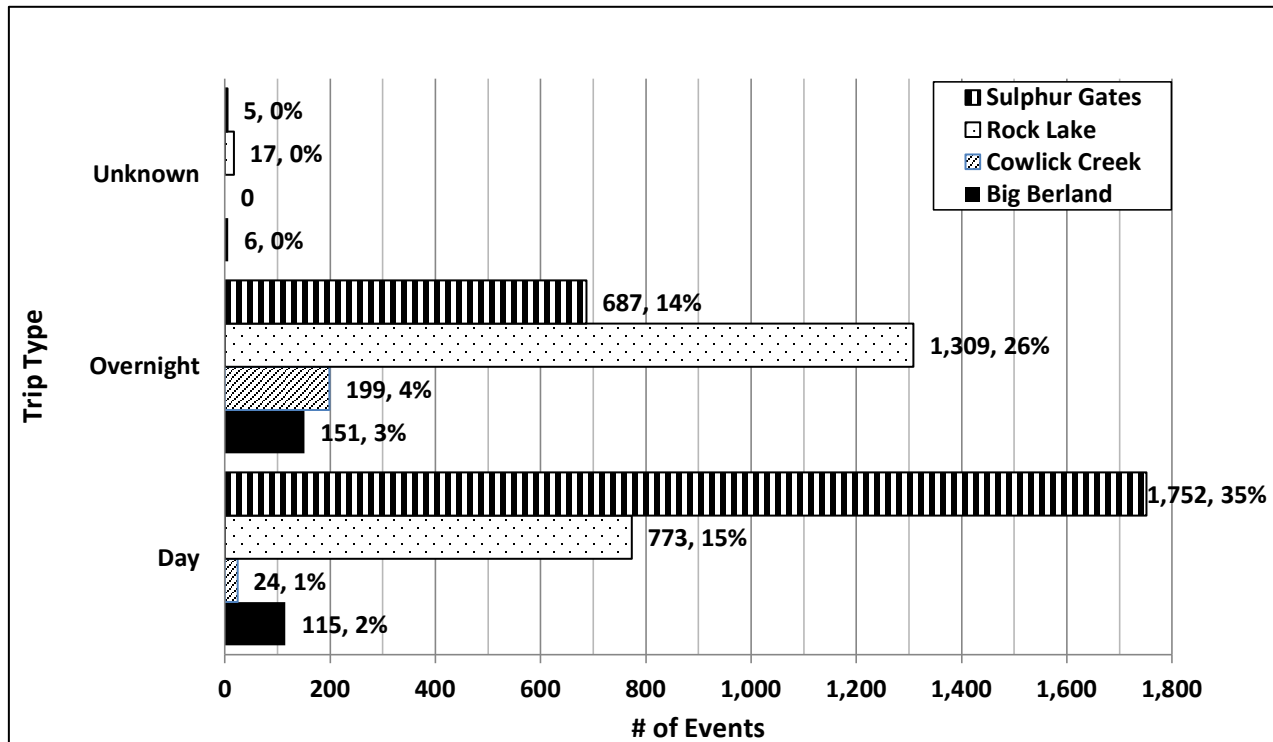


**Figure 12. Activities Summarized by Individual Staging Areas**

$n = 5,038$ . Sulphur Gates camera was missing 18.9 days of data due to human tampering. Activities were coded from images where obvious gear, equipment or apparel was present. Percentages are rounded.

#### 4.1.1.3.3 Trip Types

Cumulatively for all staging areas, day trips (53%) were more popular than overnight trips (47%). Please refer to Appendix H for a description of how trip types were coded. At individual staging areas, a different use pattern emerged. Sulphur Gates had the highest day use and Rock Lake had the highest overnight use (Figure 13). Cowlick Creek and Big Berland had more overnight users than day users (Figure 13).



**Figure 13. Trip Type Summary for Individual Willmore Staging Areas**

$n = 5,038$ . Sulphur Gates camera was missing 18.9 days of data due to human tampering. Due to image quality and contrast, it was not possible to discern day versus overnight use so this resulted in the trip type for some human events to be coded to unknown. Percentages are rounded.

In the U.S. there are protected wilderness areas which are vast in size. The physical legal boundaries of these areas are a distance to reach from some trailheads. This tends to limit day use in some of these wilderness areas (Dawson & Hendee, 2009). Large wilderness areas can also be located far away from major centres. This results in the area being more of a multi-day trip destination rather than a destination for shorter day or weekend trips (Dawson & Hendee, 2009). Wilderness day use in the U.S. was estimated to comprise more than half of all visits to the National Wilderness Preservation System (NWPS) (Abbe & Manning, 2007). These day users may have an alternative perception of wilderness (e.g., concepts or values) compared to multi-

day users, and can be the cause of resource (e.g., trail, litter, wildlife) and social impacts (e.g., crowding and conflict) (Abbe & Manning, 2007). Often, little or no park management action has been directed to the resultant impacts from day use (Abbe & Manning, 2007). Sulphur Gates staging area is located close to a major highway and the town of Grande Cache. It is also a well-established staging area with good road access and a short drive to the trailhead facilities which include outdoor washrooms, picnic tables, horse corrals and camping spots for both day and overnight use. Access to the Willmore park boundary is a short distance from the staging area, so low effort is required to access Willmore from this location. A popular day hike (Eaton Falls) is located approximately 3 km from the Sulphur Gates trailhead and located inside the Willmore park boundary. In general, there appeared to be more information available about the Sulphur Gates staging area. For example, staff from the local visitor information centre seemed to suggest Eaton Falls as a destination due to its proximity to the trailhead and simple access for a variety of ages and abilities. Views at the trailhead are also immediate, with the option of a very scenic and short viewpoint of the confluence of the Smoky and Sulphur Rivers from the Sulphur Gates trail (which is located in the Sulphur Gates Provincial Recreation Area at the edge of Willmore).

This viewpoint also gives visitors a taste of Willmore as they have a good view of the valley that leads into the park. It could be possible that Highway 40 travelers used this staging area and the associated trails as a rest stop on their way to or from Grande Prairie. Their destination may not have been Willmore in particular, but they contributed to the day use of this staging area. Though not part of this study, it would have been interesting to see how many people that visited Eaton Falls were aware they were in Willmore Wilderness Park.

Although Cowlick Creek is located close to a major highway (Highway 40) and the town of Grande Cache, it seemed less marketed for park activities. From this staging area, more time and effort is required reach the park boundary (approximately 8 km on a rougher and boggier trail). The trailhead also lacks infrastructure such as outdoor washrooms and the parking area can be wet and muddy after inclement weather. Views are limited; however, the trail offers a pleasant forest hike.

The Big Berland staging area is located in a more remote area (between Hinton and Grande Cache), and because the boundary of Willmore is approximately 8 km it requires more time and effort to access the park boundary from this trailhead. This staging area has low

infrastructure (i.e., no official campsites or outdoor washrooms), and it can be difficult to access the main parking area after inclement weather.

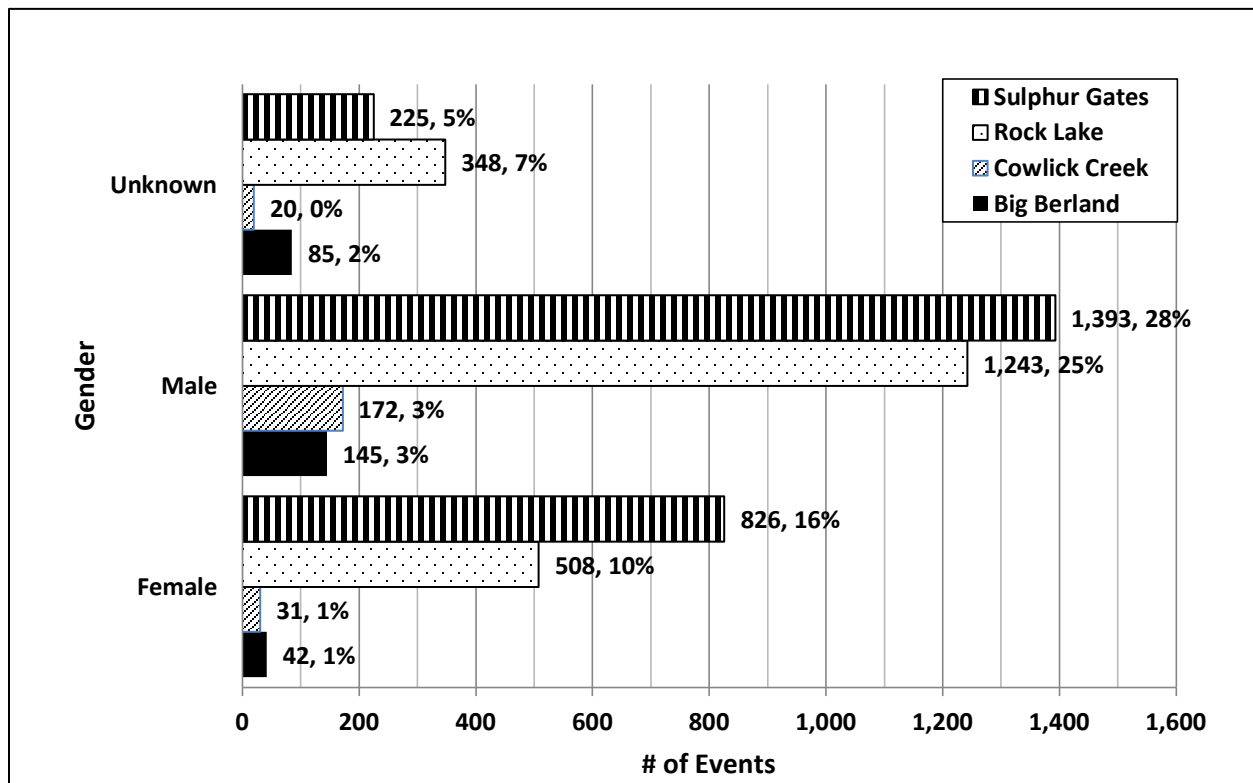
Access to the Willmore boundary from the Rock Lake staging area is near, however travel to get the staging area can be a challenge. The 32 km access road is gravel and can be challenging to travel during certain weather (e.g., during heavy rain) and in the winter. The staging area itself is well-established with day-use and overnight camp options, outdoor toilets, and horse corrals. There are tourism accommodations available near this trailhead.

Factors such as trailhead location, travel distance, and visitor awareness of the trailhead may play a role in which staging areas are popular for what type of use. Commercial operators may choose to operate out of specific trailheads, visitor information centres may suggest certain trailheads to visitors, and websites and other communications tools may market certain trailheads.

#### **4.1.1.3.4 Group Composition and Gender**

A majority of Willmore visitors travelled in a group (97%) and few visitors travelled solo (3%). Group sizes were not determined; however this should be counted in future studies. It is a common finding from past wilderness research that males comprised the majority of visitors. Past studies found that males can comprise greater than 70% of the visitors within a typical wilderness area (Dawson & Hendee, 2009; Dvorak, Watson, Christensen, Borrie, & Schwaller, 2012; Wallace, Brooks, & Bates, 2004) and hence wilderness use has been viewed within a more masculine sense (Dawson & Hendee, 2009). In Willmore, 59% of visitors were male and 28% were female. Thirteen percent were unknown as gender was indiscernible from certain images. It was likely that male visitation was higher than reported in this study, taking into account the lost images from camera tampering at Sulphur Gates, and past trends from other wilderness areas. Looking specifically at individual trailheads, males were the dominant gender across all trailheads (Figure 14). There were low numbers of females present at the Big Berland and Cowlick Creek staging areas (Figure 14). Referring back to earlier in this section, Cowlick Creek was a popular staging area for horse and hunting related activities. The highest visitation by females was at Sulphur Gates Trailhead. This trailhead also had the highest day use so it was possible that day trips into Willmore were more popular with females. Dvorak et al. (2012) found that there were a larger percentage of women that comprised day user survey respondents. Dawson and Hendee (2009) noted that smaller areas that are more oriented towards hiking

exhibit slightly higher average female visitation than wilderness areas that are large in physical size and are more horse-focused.



**Figure 14. Gender Summary for Individual Staging Areas**

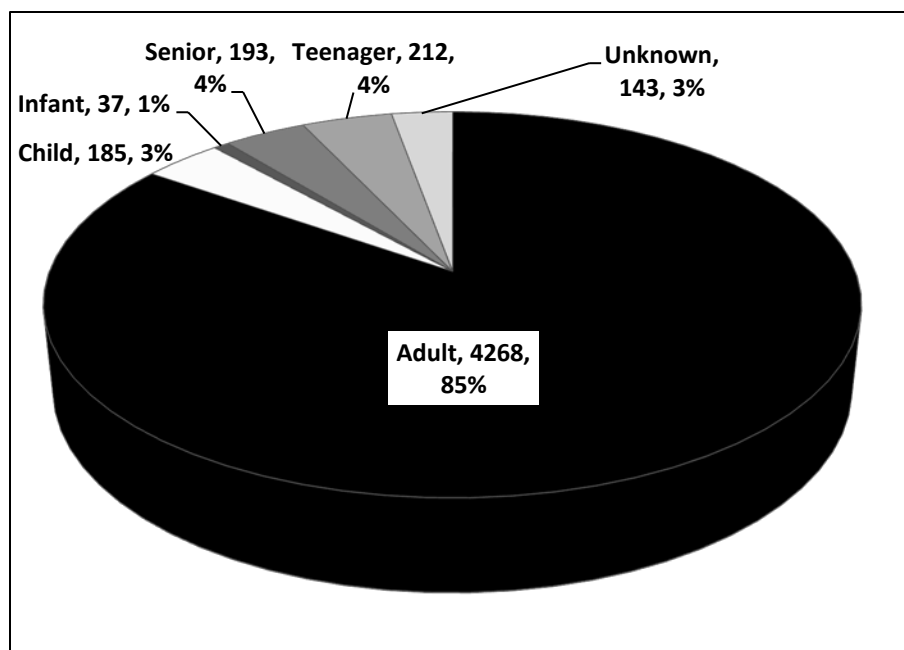
$n = 5,038$ . When gender could not be determined from the image it was coded as unknown. Sulphur Gates camera was missing 18.9 days of data due to human tampering. Percentages are rounded.

There has been much research into leisure constraints, but there was limited research on constraints and wilderness with the exception of Green, Bowker, Johnson, Cordell, and Wang (2007) and Schneider, Schroeder, and Schwaller (2011). According to Jackson (2000, p. 62) constraints are “factors that are assumed by researchers and/or perceived or experienced by individuals to limit the formation of leisure preferences and/or to inhibit or prohibit participation and enjoyment in leisure.” Green et al. (2007) found that women felt more constrained in all constraint questions compared to men. Reasons included “not aware of wilderness areas, physical disability, feel uncomfortable in wild areas, don’t have enough hiking and map reading skills, prefer places with more people, don’t know about recreation opportunities, hiking and climbing trails is difficult, lack basic services, and concerned for personal safety” (Green et al., 2007, p. 31). In their study of wilderness visitation and structural, intrapersonal, and

interpersonal constraints, Schneider et al. (2011) found that a new infant was the most constraining for some women in their study.

#### 4.1.1.3.5 Age Categories of Visitors

Dawson and Hendee (2009) suggested wilderness visitors were more likely to be young to middle-aged adults. However, younger and older age classes were present as well (Dawson & Hendee, 2009). In general wilderness users tend to be younger than the general population (Roggenback & Lucas, 1987). In Willmore, the majority of visitors (85%) were adults (Figure 15).

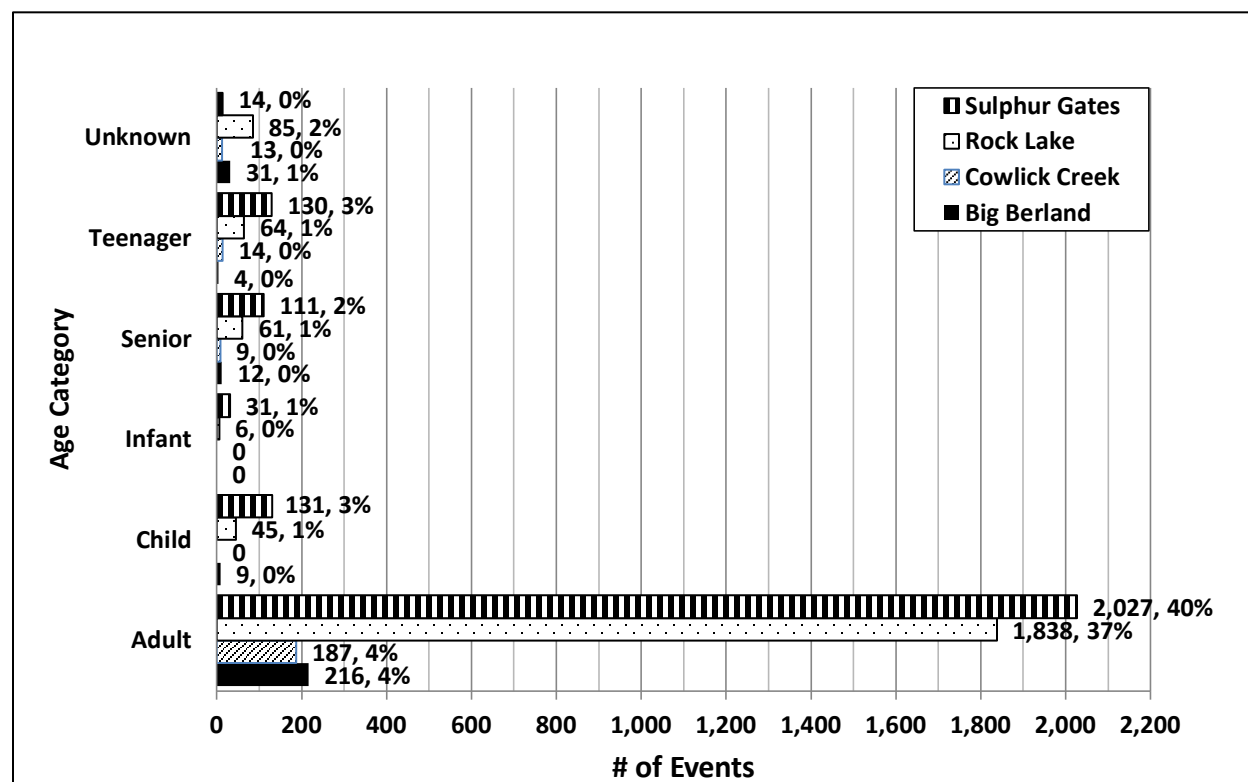


**Figure 15. General Age Categories of Visitors Across all Staging Areas**  
*n* = 5,038. Age category of the visitor was estimated from the camera image into the following categories: infant (in stroller or being carried), child (able to walk and under 12 years), teenager (12-18), adult (18 to 55), senior (55 and above).

Similar to using images to classify visitor activity types, there were limitations with classifying the age category from camera images. There may be inter-rater bias (individual project staff coding the same object differently) present depending on who was coding the image. In this project, two different summer staff coded the images and the principal researcher did a final quality control check of the image coding for all images. However, there still may have been coding inconsistency for more subjective fields such as gender, age category, or activity. For example, for the age category of humans, what appeared to be an older adult for one person coding the image may have appeared as an adult for another. In some cases, coding the image for

age category was an estimate. For example, distinguishing an adult from a teenager, or an adult from a senior in an image may be difficult.

Adults were the most commonly represented age category across all staging areas (Figure 16). The highest proportion of adults was present at Sulphur Gates closely followed by Rock



**Figure 16. General Age Categories of Visitors Across Individual Staging Areas**

$n = 5,038$ . Age category of the visitor was estimated from the camera image into the following categories: Infant (in stroller or being carried), child (able to walk and under 12 years), teenager (12-17), adult (18 to 55), senior (55 and above). Percentages are rounded off.

Lake (Figure 16). It was most common to find infants, children, teenagers and seniors at the Sulphur Gates staging area, though their numbers were not large. No children were recorded at the Cowlick Creek staging area.

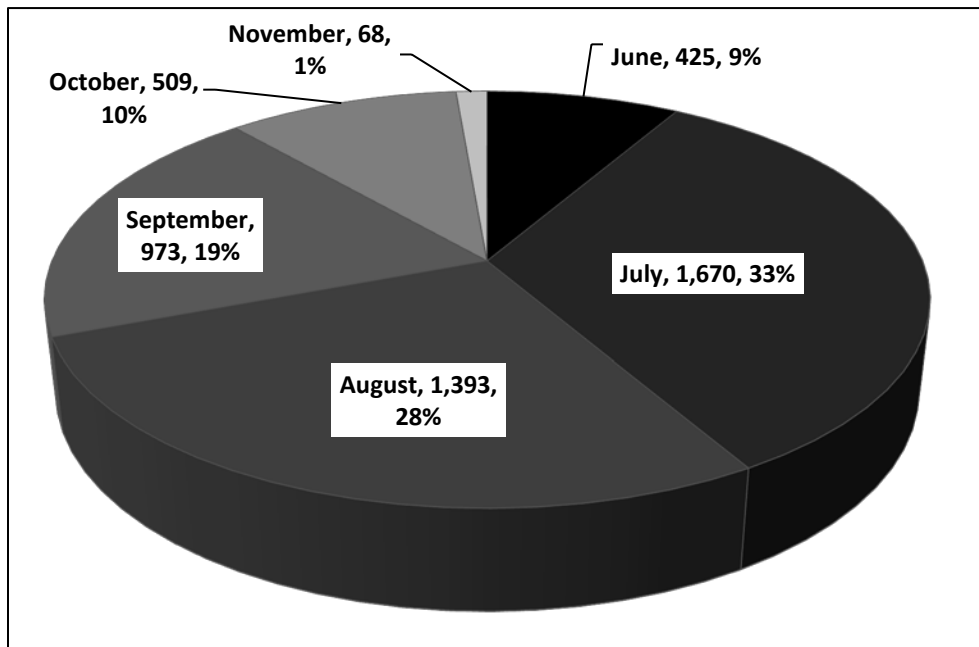
#### 4.1.1.4 Visitor Temporal Use

##### 4.1.1.4.1 Individual Visit Counts - Monthly

For all the staging areas combined, the highest visit count occurred during summer in the month of July (Figure 17). This coincides with findings by Dawson and Hendee (2009) where the highest visitation to wilderness areas in the United States was found to occur during the summer season. However, because Sulphur Gates was missing a large proportion of data from

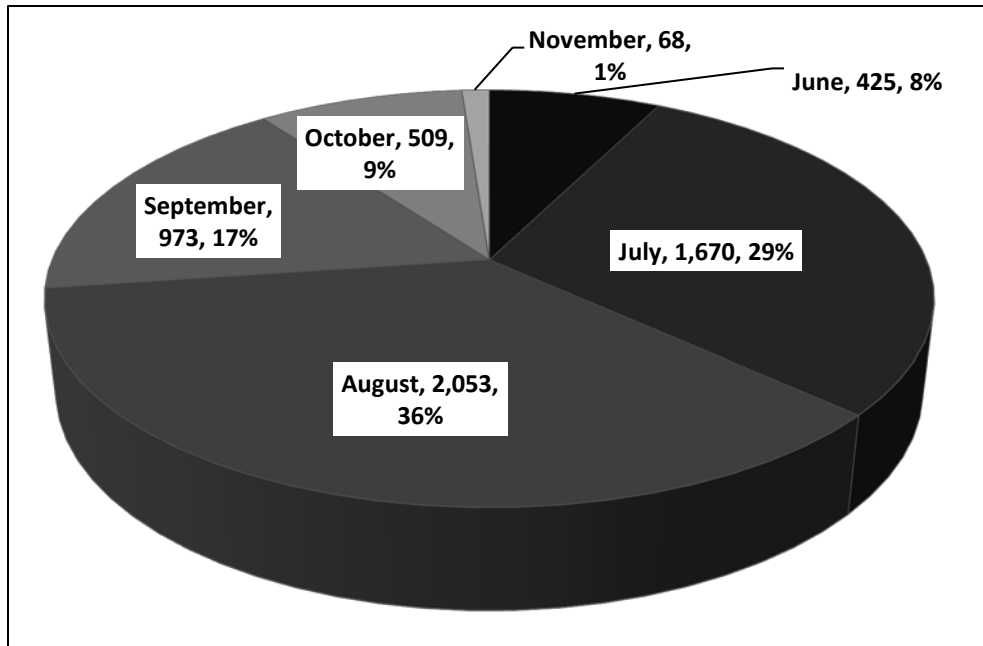


August (18.9 days), it was very likely that August visitation would have been higher if data had been collected during this period. To illustrate this possibility, extrapolated data values for humans were applied to monthly human counts (Figure 18). August was the highest use month across all four staging areas with the extrapolation. Typically, river levels are lower in August (due to less run-off) which makes river crossings easier for both horse and hikers. August also tends to be drier with less precipitation, though snow is still possible in the backcountry during all summer months.



**Figure 17. Total Visit Counts for all Staging Areas Summarized by Month**  
 $n = 5,038$ . Only human events are included in visit counts. Sulphur Gates camera was missing 18.9 days of data due to human tampering.

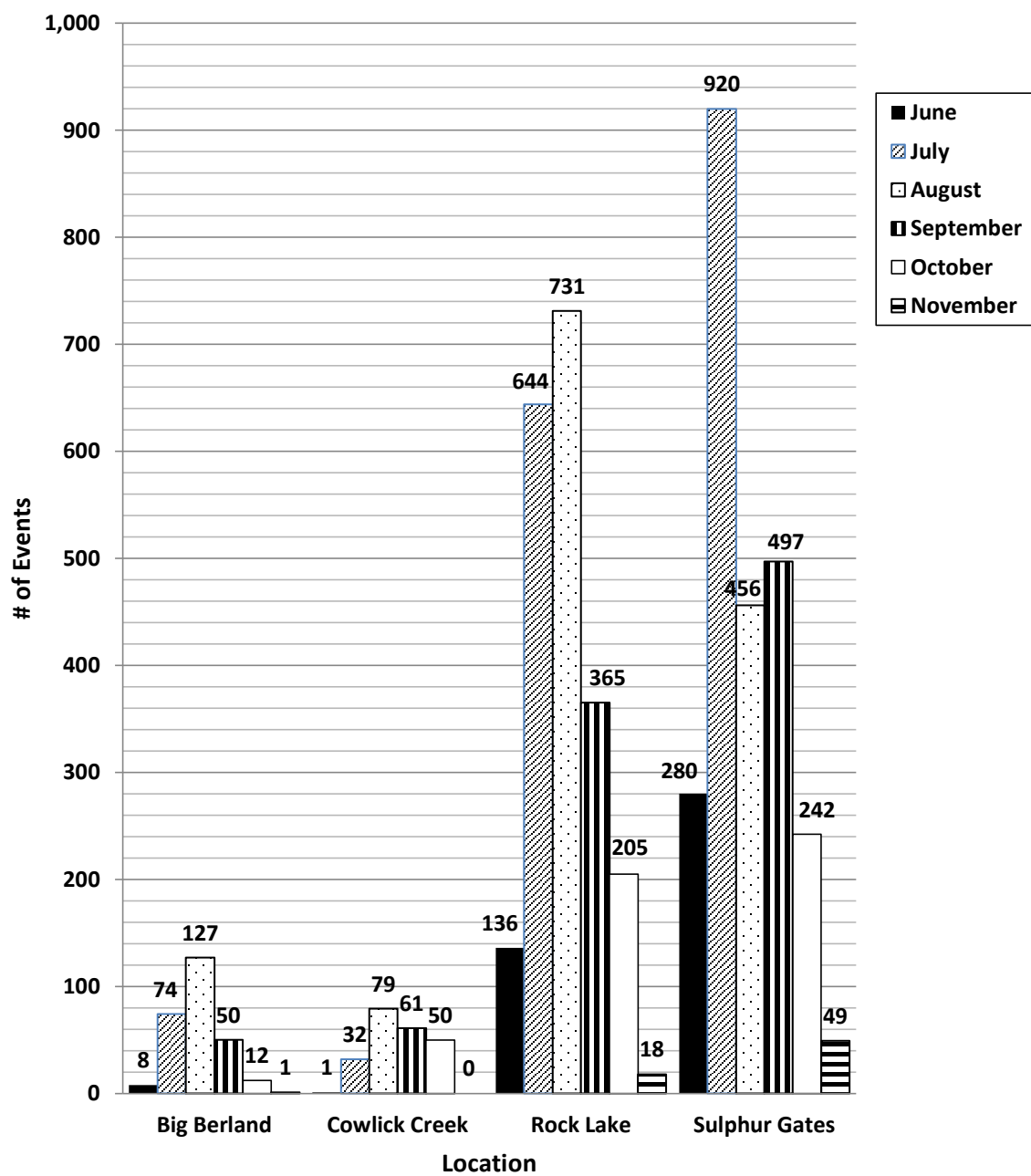
There was little climate information available for Willmore Wilderness Park. However, due to the size of the park and the diversity in physical geography and varying altitude, the weather can be expected to vary throughout the park (Graham & Quintilio, 2006). The hunting season in Willmore for many large game species begins at the end of August which results in steady amount of visitation into the months of September and October at staging areas.



**Figure 18. Total Visit Counts for all Staging Areas Summarized by Month with Extrapolation**

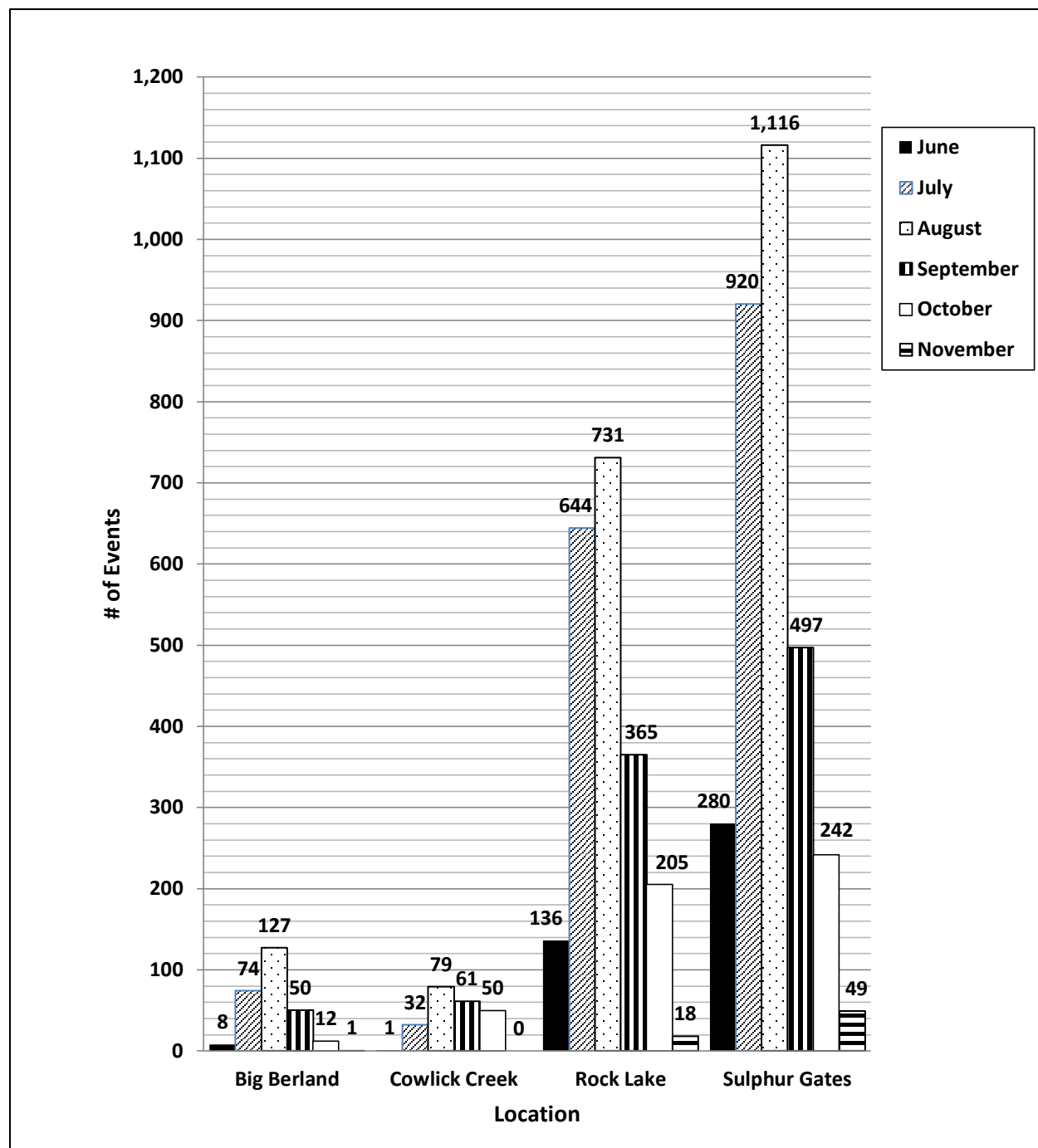
$n = 5,698$ . Only human events are included in visit counts.

For individual staging areas, Figure 19 summarizes total visits counts by trailhead for each month. Across all staging areas, August was the highest use month with the exception of Sulphur Gates. For all four staging areas, November exhibited the lowest monthly visitor count (Figure 19). It is quite likely that without the missing data for the Sulphur Gates camera that the trend would have also resulted at Sulphur Gates with August being the highest use month. The extrapolated values were applied to the monthly total for Sulphur Gates and the resultant graph is shown in Figure 20. With the extrapolation, August was the highest use month for Sulphur Gates.



**Figure 19. Monthly Total Visit Counts Summarized by Individual Staging Areas**

*n* = 5,038. Only human events are included in visit counts.

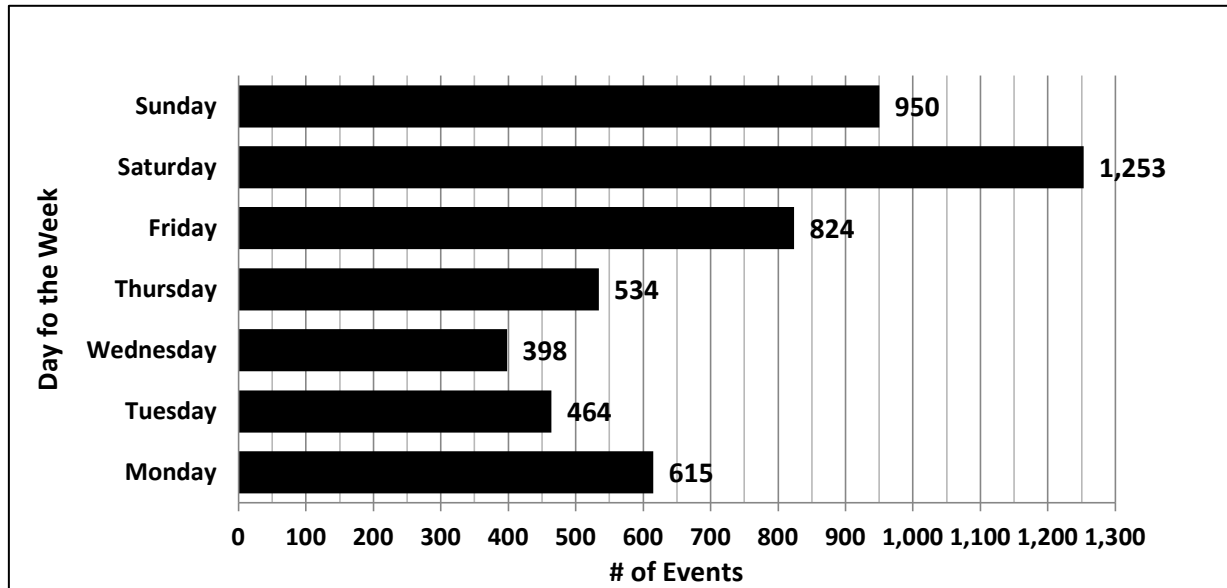


**Figure 20. Monthly Total Visit Counts Summarized by Individual Staging Areas with Extrapolation**

$n = 5,698$ . Only human events are included in visit counts.

#### 4.1.1.4.2 Individual Visit Counts - Daily

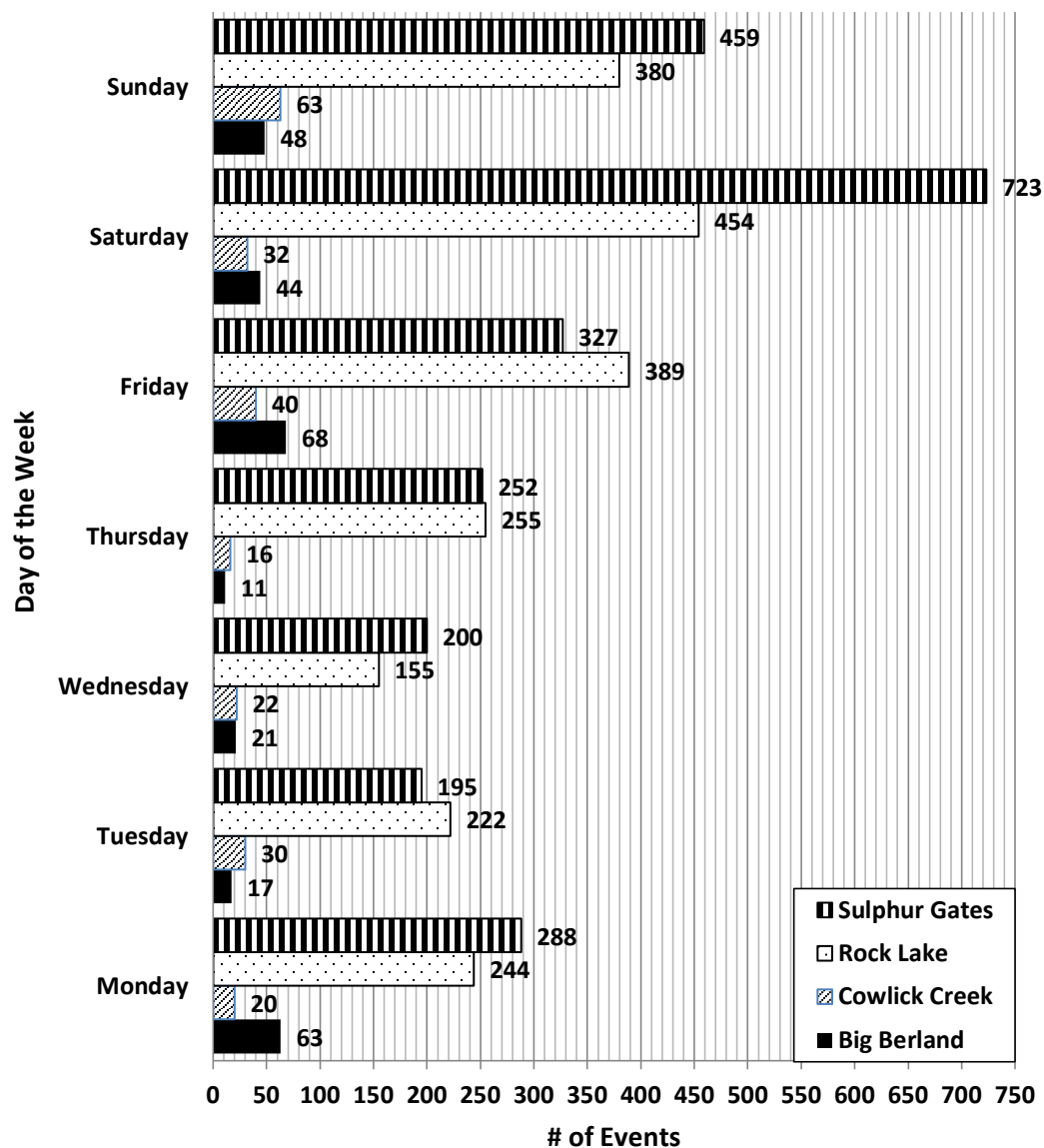
Weekends (Saturday and Sunday) were the busiest days across all Willmore staging areas and Fridays were the busiest week day (Figure 21). Wednesdays were the least busy week day.



**Figure 21. Daily Individual Visit Counts Summarized Across all Staging Areas**

*n* = 5,038.

By examining each individual staging area, interesting patterns emerged. Sulphur Gates generally followed the overall pattern of Figure 21 and had the highest total daily individual visit count on weekends including a large peak on Saturdays (Figure 22). The busiest week day at Sulphur Gates was Fridays (Figure 22). Visit counts for Rock Lake also followed the weekend trend; however, the peak on Saturdays was not as large as the peak at Sulphur Gates. Fridays were also a popular day for visitors at Rock Lake (Figure 22). Cowlick Creek experienced higher individual visit counts on weekends however, peak visit counts occurred on Sundays with Fridays being the busiest week day (Figure 22). Big Berland was the only staging area that did not follow the general pattern of higher weekend use. The highest individual visit counts occurred on week days, with Mondays and Fridays having the highest counts.

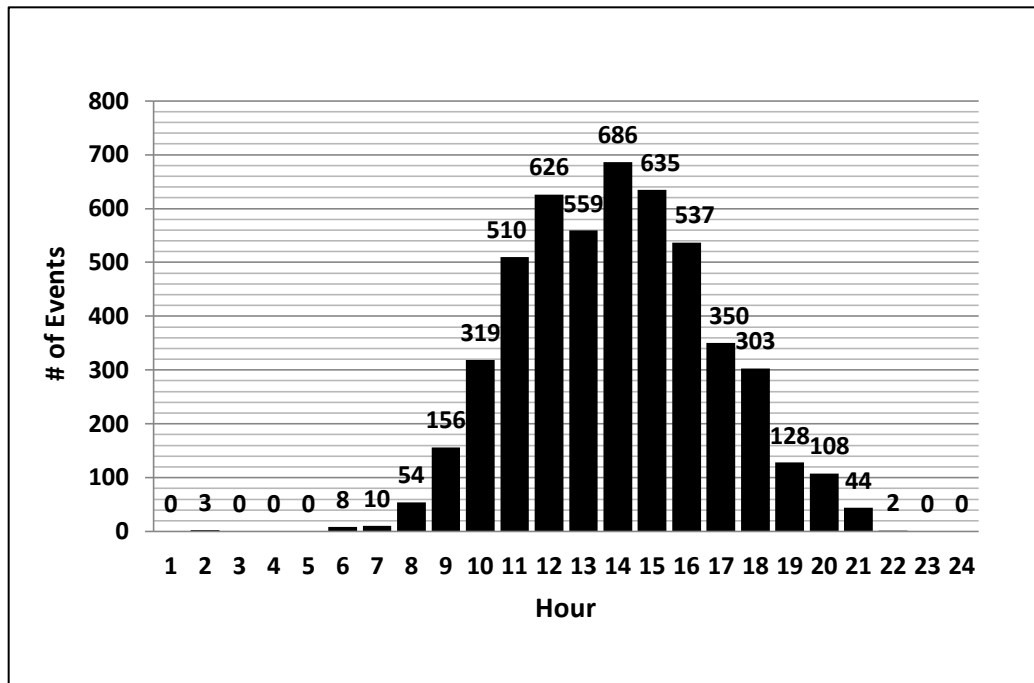


**Figure 22. Total Daily Individual Visit Counts for Each Staging Area**

$n = 5,038$ .

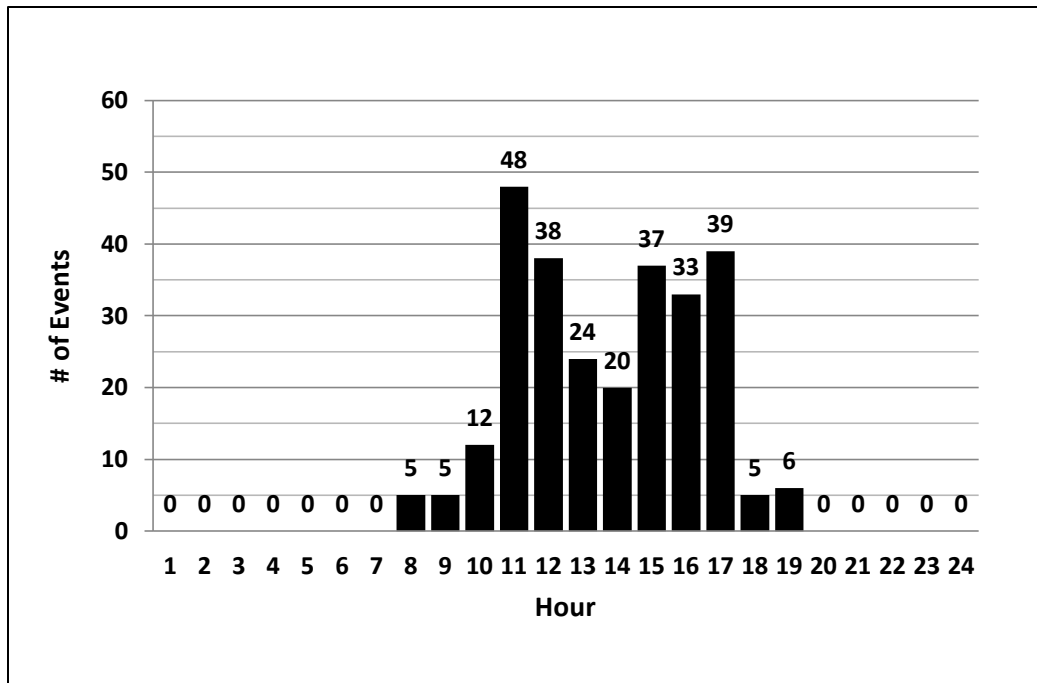
#### 4.1.1.4.3 Visit Counts - Hourly

The majority of visit counts occurred between 10:00 and 18:00 across all staging areas (Figure 23). Though visit counts were lower after 16:00, there was visitor activity at staging

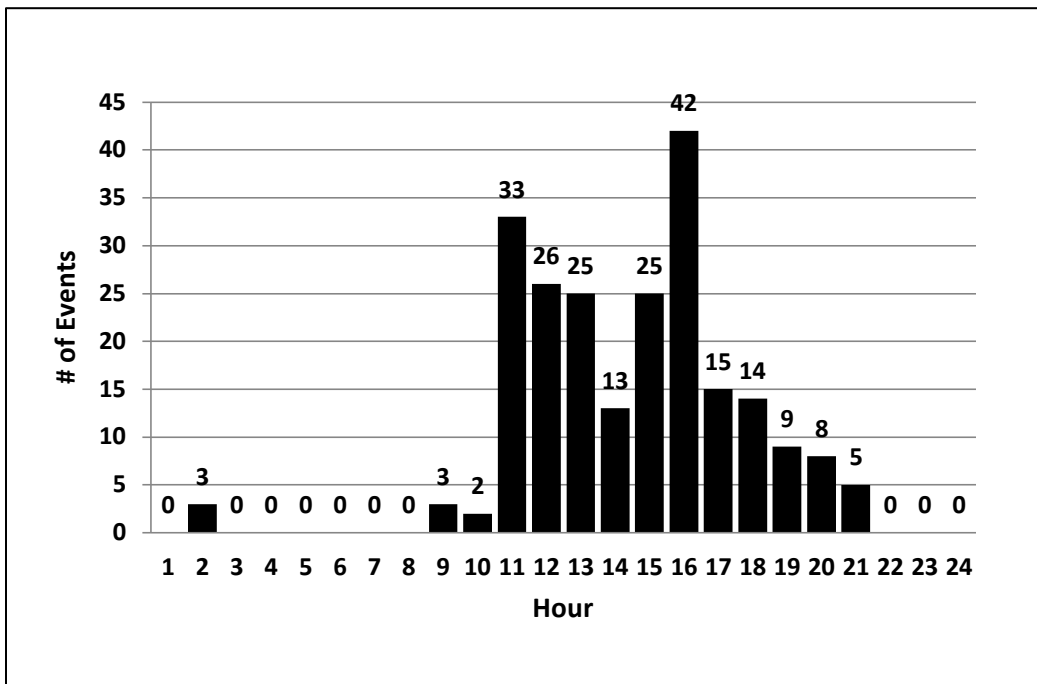


**Figure 23. Visit Counts Summarized by Hour Across all Staging Areas**  
 $n = 5,038$ .

areas later in the day and into the evening. Visit counts were low before 8:00 across all staging areas. Visitor activity at Big Berland (Figure 24) was most common between 11:00 and 17:00. This was similar to Cowlick Creek (Figure 25) where visitation was highest between 11:00 and 16:00. Rock Lake staging area activity was more common between 11:00 and 17:00. Activity at Rock Lake began earlier in the day before 9:00 and continued later into the day after 18:00 (Figure 26). Sulphur Gates visitation began before 10:00, peaked at 14:00 and continued past 18:00 (Figure 27).

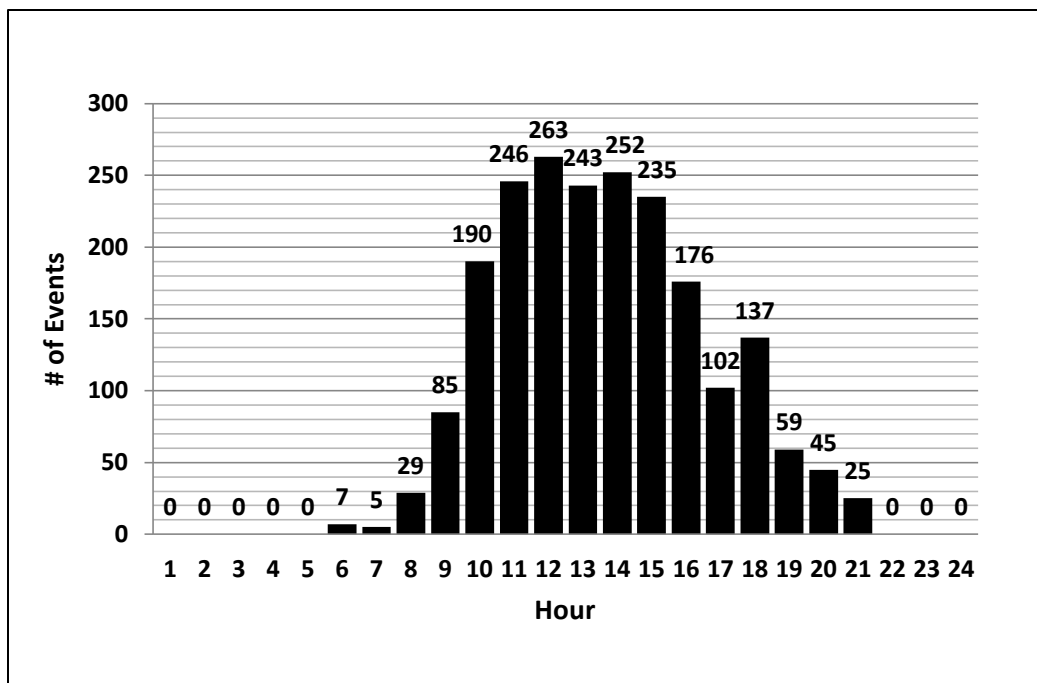


**Figure 24. Visit Counts Summarized Hourly for Big Berland Staging Area**  
*n* = 272.

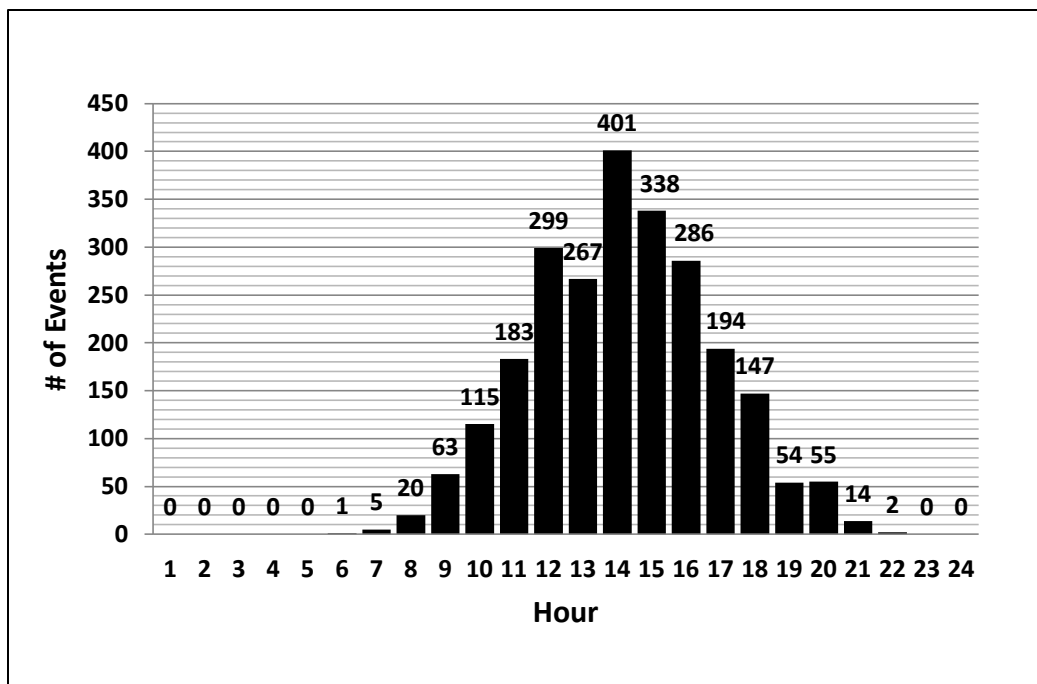


**Figure 25. Visit Counts Summarized Hourly for Cowlick Creek Staging Area**  
*n* = 223.





**Figure 26. Visit Counts Summarized Hourly for Rock Lake Staging Area**  
*n* = 2099.



**Figure 27. Visit Counts Summarized Hourly for Sulphur Gates Staging Area**  
*n* = 2444.

#### **4.1.1.4.4 Trail Camera Summary**

Overall, trail cameras were powerful, low cost, and low maintenance instruments for gathering visitation, stock, wildlife numbers and visit characteristics. Trail cameras assisted in gathering “the where” (e.g., where are the most highly visited staging areas?), “the when” (e.g., when are the busiest times and days?), “the who” (e.g., who is visiting Willmore – men or women?), and “the what” (e.g., what are the main travel modes?). Trail cameras were a powerful tool for collecting information for user segments that have typically been challenging to gather. As discussed, previous research had identified low response rates for stock users for both self-registration and trailside bulletin boards (Cole, Hammond, & McCool, 1997; Lucas, 1983; Petersen, 1985). Trail cameras were a simple and effective instrument to gather accurate stock counts which in past Willmore studies have not been obtained. Limitations of the trail cameras included: potential for human tampering, reduced ability to capture fast moving objects, not capturing all the use in the area (theoretically a visitor may enter and exit Willmore in any location), resources and time to analyze the images, and ethical considerations regarding the use of technology in wilderness.

#### **4.1.2 Trail Surveys**

As described under the methods section of this thesis, self-administered trail surveys were available for users to complete through a variety of distribution methods. This section summarizes the information collected from completed self-administered trail surveys. Specifically, the response rates and the resulting visitor and trip characteristics are revealed and discussed.

##### **4.1.2.1 Survey Response Rates**

Self-administered trail surveys were available at all staging areas, through the Internet, and at additional locations from mid-June 2010 until early December 2010. A total of 201 surveys were completed by park visitors. Four surveys were incomplete and another two were questionable in authenticity so a total of six surveys were excluded from analysis resulting in 195 that were used in the final analysis. The proportion of visitors that completed a survey (i.e., compliance) was unknown. Previous research has shown that trail registration response rates can vary (Lucas, 1983; Petersen, 1985). For example, Cole and Hall (2008) found approximately two-thirds of wilderness visitors completed trail registration upon entering a wilderness area. O’Brien (1983) observed that groups that were guided (e.g., horse or hiking) failed to register

while observing self-registration compliance at Willmore in 1982. O'Brien determined that 66% of visitors to Willmore completed self-registration when entering the park (O'Brien, 1983).

Table 4 summarizes the number and percent of trail surveys that were completed by distribution type.

**Table 4. Completed Surveys Summarized by Distribution Type**

<b>Distribution Type</b>	<b>Number</b>	<b>Percent</b>
Conservation officer	7	3.6%
Downloaded from website	6	3.1%
Dropped off to individual	1	0.5%
Eagles Nest cabin	10	5.1%
Information centre	7	3.6%
In-person	52	26.7%
Kiosk	101	51.8%
Online survey	10	5.1%
Rocky Mountain Riding Association	1	0.5%
	195	100.0%

Most visitors (51.8%) completed trail surveys through pen and paper at one of the survey stations. Visitors that were asked to complete a survey by one of the summer research assistants (i.e., in-person) at either Sulphur Gates or Rock Lake staging areas was a popular method of completion (26.7%). The completion of a survey through the Internet (by either downloading or completing an online survey) was not a popular choice for survey completion (on-line surveys 5.1% and downloaded surveys 3.1%). The total number of surveys that were distributed was unknown. There was one known refusal from a participant to complete a survey in-person at the Cowlick Creek trailhead. The summer research assistant reported that the male park visitor thought this survey was being carried out by the Willmore Wilderness Foundation and replied “it’s none of your damn business.”

#### **4.1.2.2 Visitor Characteristics/Profile**

##### **4.1.2.2.1 Origin**

Ninety-five percent of visitors that completed surveys were from Canada (Table 5). Six other countries were represented though in small percentages with the United States being the highest represented country at 2% (Table 5). The majority of Canadian visitors to Willmore

**Table 5. Country of Origin of Willmore Visitors**

<b>Country</b>	<b>Number</b>	<b>Percent</b>
Canada	186	95.4%
Czech Republic	1	0.5%
England	1	0.5%
France	2	1.0%
Netherlands	1	0.5%
New Zealand	1	0.5%
United States	3	1.5%
	195	100.0%

**Table 6. Province of Origin of Canadian Willmore Visitors**

<b>Province</b>	<b>Number</b>	<b>Percent</b>
Alberta	165	90.2%
British Columbia	8	4.4%
Manitoba	1	0.5%
Northwest Territories	2	1.1%
Nova Scotia	1	0.5%
Ontario	4	2.2%
Saskatchewan	2	1.1%
	183	100.0%

were from Alberta (90.2%) (Table 6). McFarlane and Watson (1998, 1999) had reported 91% of their registrants were from Alberta in 1998 and 86% in 1999. There were few visitors from the neighboring provinces of British Columbia (4.4%) and Saskatchewan (1.1%) (Table 6). A majority of wilderness visitors are from the region where the wilderness park is located (Dawson & Hendee, 2009).

The majority of provincial Willmore visitors were from non-local urban communities (greater than 50 km from the Willmore park boundary). Edmonton and adjacent communities (Ardrossan, Beaumont, St. Albert, Sherwood Park, Spruce Grove, and Stony Plain) comprised 27.9% of visitors (Table 7). Local communities (Brule, Hinton, and Grande Cache) comprised 17.6% of visitors (Table 7). Visitors originating from the Calgary area (Calgary and Cochrane) comprised 4.8% and the remainder of visitors (49.7%) were from locations throughout Alberta.

**Table 7. Origin of Alberta Willmore Visitors**

<b>Area</b>	<b>Number</b>	<b>Percent</b>
Edmonton region	46	27.9%
Calgary region	8	4.8%
Local communities	29	17.6%
Other	82	49.7%
	165	100.0%

These findings were similar to McFarlane and Watson (1998, 1999) where the majority of visitors originated from the Edmonton and surrounding area (e.g., Sherwood Park and Spruce Grove). However in this trail survey, more local visitors from Grande Cache completed visitor surveys compared to McFarlane and Watson's previous studies where only two surveys were completed each in 1998 and 1999 from Grande Cache. In general, a majority of wilderness visitors originate from urban locations but typically do not travel far distance to visit wilderness (Lucas, 1989). The proportion of urban visitors is typically related to the presence of nearby urban areas (Lucas, 1989). Though there were a variety of smaller communities represented by Willmore visitors, a majority of the visitation was from larger local and non-local urban centres such as Hinton, Grande Cache, Grand Prairie and Edmonton and its surrounding communities.

#### **4.1.2.2.2 Age and Gender**

Age was reported by the respondents through general age categories which corresponded to gender. One individual for each group completed a survey that reported the general age categories of their group members. Survey participants along with their group members slightly consisted more of males (53%) than females (47%) (Table 8). The highest percentages of both males (13%) and females (11%) were present in the 50 to 59 year age category (Table 8). As discussed earlier, trail cameras revealed that a majority of visitors were adults (85%) and were male (59%) corroborating the results for age and gender from the trail surveys.

**Table 8. Age Category and Gender of Survey Participants**

<b>Age Category</b>	<b>Male</b>		<b>Female</b>	
	<b>Number</b>	<b>Percent</b>	<b>Number</b>	<b>Percent</b>
9 and under	7	1.0%	10	1.4%
10 to 19	42	5.7%	39	5.3%
20 to 29	69	9.4%	64	8.8%
30 to 39	69	9.4%	42	5.7%
40 to 49	54	7.4%	63	8.6%
50 to 59	98	13.4%	78	10.7%
60 and over	46	6.3%	50	6.8%
	385	52.7%	346	47.3%

*Note.*  $n = 731$ . 194 out of 195 trail surveys provided ages of participants.

#### 4.1.2.2.3 Group Size and Composition

Group size ranged from one to 19. The average group size of survey participants was 3.8 ( $n = 194$ ). The largest proportion of visitors (39.2%) consisted of a group size of two (Table 9). The same pattern was found by Cole and Hall (2008) where the most common group size for wilderness travelers was two and Dawson and Hendee (2009) where the group size of wilderness visitors often consisted of two to four people. In Willmore, solo travelers comprised the lowest percentage of visitors (9.3%) (Table 9). In general, few visitors travel to wilderness solo (i.e., less than 10% of all wilderness visitor groups) (Dawson & Hendee, 2009). The total number of visitors to Willmore was 731 ( $n = 194$ ).

**Table 9. Group Size**

<b>Group Size</b>	<b>Number</b>	<b>Percent</b>
One	18	9.3%
Two	76	39.2%
Three	33	17.0%
Four	22	11.3%
Five or more	45	23.2%
	194	100.0%

The majority of respondents were travelling with friends (46%), family (32%), or a spouse/partner (32%) (Table 10). This pattern was also found for participants in the Alberta Park visitor survey where over 91% travelled with friends or family (The Praxis Group, 2008). In general for wilderness areas that have had long term visitor studies, group size has been found to be declining in size (Dawson & Hendee, 2009). This may be attributed to rules and regulations pertaining to group size and concerns in general from the groups themselves about

environmental and wilderness experiential impacts from larger groups (Dawson & Hendee, 2009). To date in Willmore, there have been no firm restrictions on group size. This coincided with results from nearly all wilderness areas where small groups of family and close friends comprised the majority of users (Dawson & Hendee, 2009). Hikers categorized as solo, sometimes had a dog or dogs(s) as travel companions. It was identified by Coble, Selin, and Erickson (2003) that solo hikers experience psychological benefits (e.g., freedom of choice, autonomy, and personal control), but they may also experience fear while hiking solo. The main fears that were revealed included: being injured by another, accidental injury or emergency, getting lost, fear of wildlife or dogs, and theft occurring to their unattended vehicle (Coble et al., 2003).

**Table 10. Group Composition**

<b>Group Type</b>	<b>Number</b>	<b>Percent*</b>
Alone	16	8%
Business associates/colleagues	2	1%
Clients	1	1%
Dog	4	2%
Family	63	32%
Friends	89	46%
Guide/outfitter	9	5%
Organized group/club	6	3%
Spouse/partner	63	32%

*Note.*  $n = 195$ . \*Percentage exceeds 100% because respondents could provide more than one answer.

#### **4.1.2.2.4 Frequency of Previous Total Visits**

The number of previous total visits ranged from none to 1000 visits. Seventy-five percent of the respondents fell into one of two frequency categories: first-time visitors and repeat visitors with five or more previous visits (Table 11). The percentage of first-time visitors very similar to findings from Cole and Hall (2008) where they found 43% of their participants were on their first trip to wilderness. A previous research study in Alberta Parks, revealed that many provincial park users are repeat visitors indicating they mainly visit one park (The Praxis Group, 2008). Repeat visitors present an opportunity for education and outreach. These visitors may also have a stronger attachment to the area they are frequenting. “Past experience at a place and a longer history of contact with a place tend to be positively associated with emotional place attachments” (Brooks, Wallace, & Williams, 2007, p. 452). This does not necessarily infer that past experience

results in place bonding, but rather time in a place is a precursor for experiences with the setting and social interactions for the accumulation of place meanings (Brooks et al., 2007).

**Table 11. Previous Total Visits**

Number of Visits	Number	Percent
None	73	38.8%
One or two	35	18.6%
Three or four	12	6.4%
Five or more	68	36.2%
	188	100.0%

*Note.*  $n = 188$ . Previous total visits not including the current visit.

#### 4.1.2.2.5 Frequency of Previous Visits Past Twelve Months

The number of previous visits in the past twelve months ranged from none to ten visits. For the majority of respondents (55.5%) it was their first visit to Willmore within the last year (Table 12).

**Table 12. Visit Frequency Past Twelve Months**

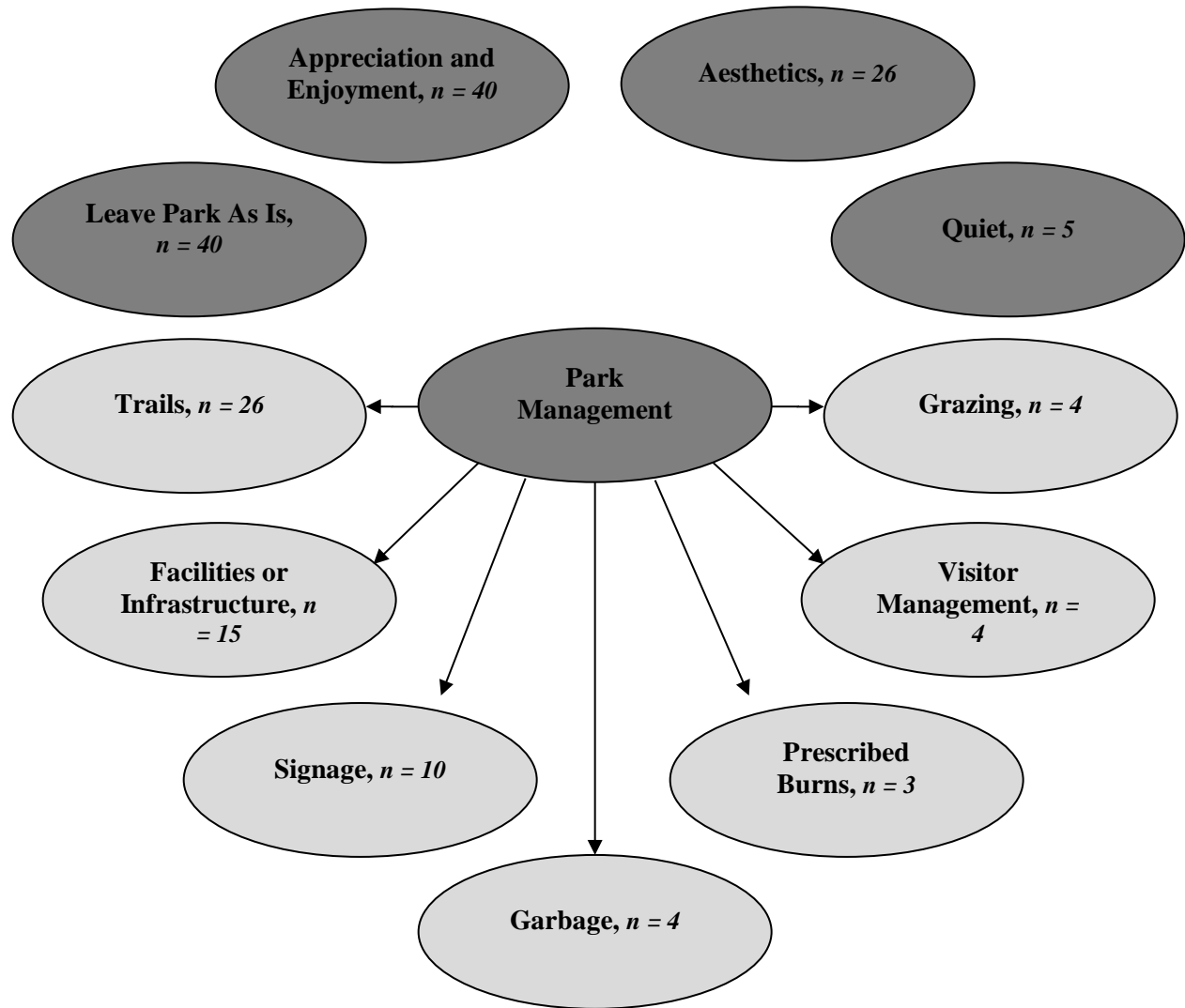
Number of Visits	Number	Percent
None	106	55.5%
One or two	49	25.7%
Three or four	24	12.6%
Five or more	12	6.3%
	191	100.0%

*Note.*  $n = 191$ .

#### 4.1.2.2.6 Visitor Comments

Respondents had the option of providing general comments towards the end of the survey. Seventy-four percent of the respondents provided additional handwritten comments. These comments were reviewed and grouped into major themes using NVivo 10 software. The main themes that emerged were the following: “appreciation and enjoyment,” “leave park as is,” “aesthetics,” “quiet,” and “parks management” (Figure 28). The highest numbers of responses were comments themed under appreciation and enjoyment of the park and leaving the park as is. Comments related to park aesthetics were also popular. The main theme of parks management was sub-divided into sub-themes: “trails,” “facilities or infrastructure,” “signage,” “garbage,” “prescribed burns,” “visitor management,” and “grazing” (Figure 28). From these sub-themes, comments related to trails, facilities or infrastructure, and signage were the most prevalent.





**Figure 28. Major Themes of Respondent Comments**

Tables 13 and 14 provide a summary, description and a sample of example comments provided by respondents. Some comments were classified under more than one theme.

**Table 13. Major Themes from Visit Comments**

Major Theme	Description of Major Theme Comments	Example Comments
Aesthetics	Related to the beauty of the park	<ul style="list-style-type: none"> <li>• “A jewel that will become more precious as it becomes rarer.”</li> <li>• “Absolutely drop dead gorgeous.”</li> <li>• “It is an incredibly beautiful part of the planet.”</li> <li>• “Beautiful sights.”</li> </ul>
Appreciation and Enjoyment	Referring to appreciation of the park and comments about the enjoyment of the trip	<ul style="list-style-type: none"> <li>• “Amazing place - will definitely be back.”</li> <li>• “Everything is great.” “We really appreciate being able to use the facilities provided here.”</li> <li>• “Have enjoyed the area for many years, like the wilderness aspect of this park.”</li> </ul>
Leave Park As Is	Comments about the park not changing and leaving things the way they currently exist in Willmore	<ul style="list-style-type: none"> <li>• “Please maintain this park and facilities as they are.”</li> <li>• “It should be used in the future the same as in the past - horses/hiking only - no changes.”</li> <li>• “Hope to see it remain a wilderness park with historical uses.”</li> </ul>
Quiet	Referring to the quiet quality of Willmore	<ul style="list-style-type: none"> <li>• “Like peace and quiet. No quads!”</li> <li>• “Nice and quiet! No generators, loud tourists!”</li> <li>• “It is beautiful, peaceful, and very quiet. No vehicles.”</li> </ul>
Park Management	Comments related to park management (was broken down into sub-themes)	<ul style="list-style-type: none"> <li>• Refer to Table 14 for parks management sub-themes</li> </ul>

**Table 14. Major Sub-themes Under Park Management Theme from Visit Comments**

Sub-Theme	Description of Sub-Theme Comments	Example Comments
Trails	Related to trails, maintenance of trails or condition	<ul style="list-style-type: none"> <li>• “Nice trail system.”</li> <li>• “All trails should be upgraded and cleaned up.”</li> <li>• “Trail is dry and need some deadfall removed (chainsaw work).”</li> </ul>
Facilities or Infrastructure	Trailhead staging areas, and park infrastructure	<ul style="list-style-type: none"> <li>• “Great facility for equestrian camping.”</li> <li>• “Nice staging area, needs washroom facilities for women.”</li> <li>• “ALL CABINS should be left unlocked in case of emergencies.”</li> </ul>
Signage	Related to comments about signage within Willmore	<ul style="list-style-type: none"> <li>• “Signage is not always very good. Hard to distinguish main trails with the number of secondary horse trails.”</li> <li>• “Could use more signage.”</li> <li>• “Signage into the staging area was minimal.”</li> </ul>
Garbage	Comments about garbage	<ul style="list-style-type: none"> <li>• “Garbage at trapper’s cabin at Rock Creek.”</li> <li>• “Concerns about garbage left at horse camps and especially ‘trapper’s cabin’ along Rock Creek. The vicinity was strewn with garbage. Terrible for bears!”</li> </ul>
Prescribed Burns	Fire or prescribed burns	<ul style="list-style-type: none"> <li>• “Prescribed burns are essential to the future of Willmore.”</li> <li>• “Brush in valley is too thick for grazing (NEEDS to be burnt).”</li> </ul>
Visitor Management	Visitor or people management comments	<ul style="list-style-type: none"> <li>• “I have never seen so many backpackers/hikers in the park. There will be conflicts with hikers tying up horse camps.”</li> <li>• “Like not having to have permits / not like Jasper (controlling).”</li> </ul>
Grazing	Grazing for stock e.g., horses	<ul style="list-style-type: none"> <li>• “Grazing was sparse.”</li> <li>• “Clear out the willows in Eagles so horses can get more grass to eat.”</li> </ul>

#### 4.1.2.2.7 Future Participation in Information Gathering

Respondents were asked to indicate their interest in participating in future information gathering related to their Willmore visit(s). Sixty-four percent of respondents indicated a willingness to be contacted. From the respondents that indicated a willingness to participate, 97% were interested in completing a more detailed questionnaire and 72% were willing to

participate in an in-depth interview/focus group. McFarlane and Watson (1998, 1999) also had found a high proportion (97.4% and 93.2%) of their study participants were interested in participating in additional information gathering on wilderness management. The researchers pointed out that these participants may represent stakeholders whose management views and opinions may not be represented through traditional stakeholder processes (McFarlane & Watson, 1998). Not all participants who indicated they were willing to participate provided complete contact information.

#### **4.1.2.3 Trip Characteristics of Willmore Visitors**

The following section describes results that summarize the trip characteristics of Willmore Wilderness Park visitors derived from the self-administered trail survey. As described in the Methods Chapter, trail surveys were available at the main Willmore staging areas, the Grande Cache, Hinton, and Switzer Park information centres, through the Internet, Eagles Nest cabin (Rock Lake staging area), and through distribution by conservation officers at the Rock Lake staging area while on a patrol.

##### **4.1.2.3.1 Trip Entry Point**

Responses indicated that Rock Lake and Sulphur Gates were the most popular trip entry points into the Willmore Wilderness Park. These two staging areas comprised over 80% of trip entries (Table 15).

**Table 15. Trip Entry Point**

<b>Entry Point</b>	<b>Number</b>	<b>Percent</b>
Big Berland	14	7.2%
Cowlick Creek	4	2.1%
Jasper National Park	1	0.5%
À la Pêche Lake	1	0.5%
Little Berland	2	1.0%
Rock Lake	101	51.8%
Sulphur Gates	71	36.4%
Victor Lake	1	0.5%
	195	100.0%

#### 4.1.2.3.2 Trip Travel Mode

The majority of respondents (62%) reported hiking as a mode of travel (Table 16). Hiking was identified as the most common travel mode in U.S. wilderness areas with few exceptions (Dawson & Hendee, 2009). Travelling by horse was more important in larger U.S. wilderness areas; however, it accounted for a minority of total previous use (Dawson & Hendee, 2009).

**Table 16. Travel Mode**

<b>Travel Mode</b>	<b>Number</b>	<b>Percent</b>
Hiking	120	62%
Horseback	82	39%
Mountain bike	5	2%
Wagon	3	1%

*Note.*  $n = 195$ . \*Total percentage exceeds 100% because respondents could provide more than one answer.

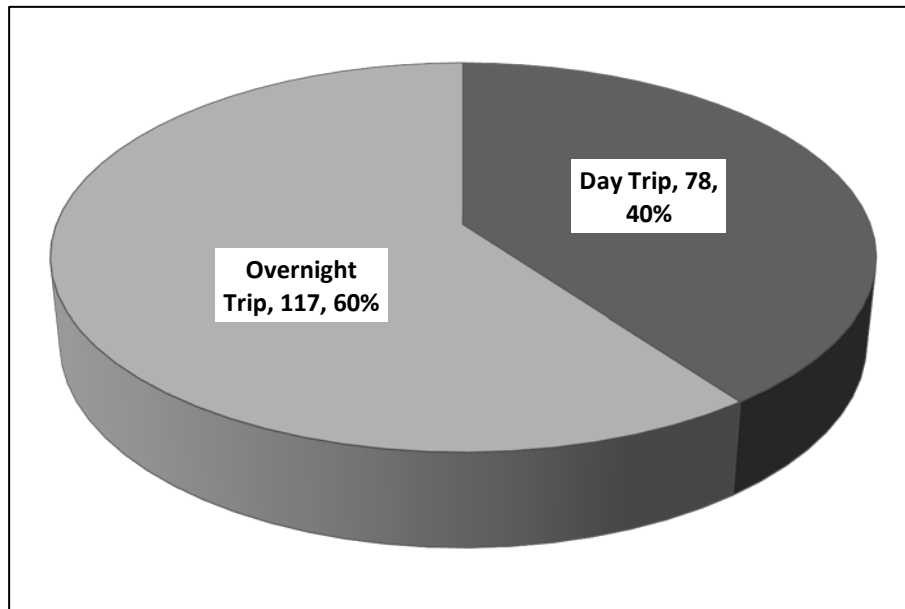
Previous studies have shown that horse users and hunters generally have a lower compliance rate at voluntary trail registers (Lucas, 1983). In general, Petersen (1985) found the compliance rate at voluntary registration stations in the U.S. varied from 20% to 89%. As discussed in the results from the trail cameras used in this study, Willmore had nearly equivalent horse (51%) and hiker (48%) use across all staging areas (bearing in mind that Sulphur Gates was missing a substantial amount of camera data during what was estimated to be a high use month August due to human tampering). This suggests that a higher proportion of hikers were completing surveys in comparison to horse users in Willmore, however compliance rates were not determined. It did appear that the number of commercial groups that completed surveys on each of their trips was few, so it was likely the sample of survey participants was not representative of the general population of Willmore visitors.

Petersen (1985) indicated that survey station visibility, messaging, station maintenance, survey design, and station location were important considerations that helped influence trail registration rates. In this study, in order to attempt to raise the participation rates of horse users, trail survey stations were implemented at horse specific staging areas at Rock Lake and Sulphur Gates in addition to the main staging areas. This was to allow for more opportunities for horse users to complete a survey before or after their trip. An effort was made to enhance existing infrastructure (i.e., messaging and aesthetics) that were used for survey distribution and new

surveys stations were built where there was not an existing station to utilize. A survey station was also located at Eagles Nest cabin which appeared to be popular location for both hikers and horse users. Petersen (1985) concluded that the location of survey stations was extremely important and compliance rates may be improved by simply selecting effective locations. At Willmore staging areas, a small awning over the survey station helped preserve the survey station from the weather and also kept people out of the elements when reading the display or completing a survey. In general, there appeared to be low completion of surveys at Sulphur Gates by both horse users and hikers. This trailhead appeared to attract a strong proportion of commercial horse use and day hikers. As found by Lucas (1983) often commercial users (e.g., guides and outfitters) do not complete surveys. Day hikers may not feel they are wilderness visitors so therefore may not be motivated to complete a trail survey (Petersen, 1985). At Sulphur Gates, it was possible that some of the day hikers were intent on Eaton Falls and were not aware they were in Willmore or were unaware of the survey station. In general, at the start of this project, many of the kiosks at the main staging areas to Willmore were under-utilized, in disrepair, and missing park information such as maps, regulations, general messaging.

#### 4.1.2.3.3 Trip Type and Length

In general, respondents reported more overnight trips (60%) than day trips (40%) to Willmore (Figure 29). The Rock Lake staging area was the most popular trailhead (66.4%) for



**Figure 29. Trip Type Summary Across all Staging Areas**

overnight trips (Table 17). Rock Lake has a well-developed campground and also camping locations for horse users. The higher proportions of overnight users at Rock Lake could reflect the effort to reach the staging area and the backcountry of Willmore. The Rock Lake trailhead is remote and access is via a 32 km gravel road that begins from Highway 40. It would be difficult to do day trips unless the visitor was based out of the campground or commercial lodging. Users may have been more aware of this staging area and backcountry trails through the Internet (e.g., web pages) and through the information and products conveyed at information centres or through commercial operators, etc. The proportion of day use was highest (60.8%) at the Sulphur Gates staging area. Wilderness studies within the U.S. have found wilderness day use to comprise a higher proportion of use than overnight visitors (Abbe & Manning, 2007; Cole & Hall, 2008).

The length of stay for overnight respondents ranged between one and seventeen nights with an average of 4.6 nights ( $n = 115$ ). There were 2,244 aggregated overnight stays reported by respondents in Willmore ( $n = 115$ ). The average length of stay in Willmore contrasted findings by Dawson and Hendee (2009) who found shorter trips of one or two nights and day use or shorts stays in general for wilderness in the U.S. For larger wilderness areas (e.g., Selway-

Bitterroot), they found that less than one-tenth of all wilderness visits were longer than a week or more in duration (Dawson & Hendee, 2009). Zinn and Graefe (2007) referred to a “speeding up of outdoor recreation” (p. 19) over the past few decades where trip durations tend to be shorter and longer trips such as one to two weeks are becoming less common. Whether this was the case in Canada, and more specifically Willmore, was not determined due to the inconsistent baseline of visitor information (especially related to outdoor recreation in wilderness areas). Dvorak et al. (2012) found a slight increase in the average length of overnight visits in the Boundary Waters Canoe Area Wilderness, U.S. from 4.0 nights in 1969, 4.2 nights in 1991 and 4.4 nights in 2007. Long term trends in trip duration are important to learn for Willmore. Shorter trips and an increase in day use have been found in many U.S. wilderness areas. This has led to the concern that short-term exposure to wilderness does not foster unique experiences and associated wilderness benefits (Cole & Hall, 2010). Longer trip lengths allow the time to travel to remote and low use areas and tend to have less impact related to overuse and crowding (O’Brien, 1982).

**Table 17. Trip Type by Trailhead**

<b>Trailhead</b>	<b>Day</b>		<b>Overnight</b>	
	<b>Number</b>	<b>Percent</b>	<b>Number</b>	<b>Percent</b>
Big Berland	2	2.5%	12	10.3%
Cowlick Creek	2	2.5%	2	1.7%
Jasper National Park	1	1.3%	0	0.0%
À la Pêche Lake	0	0.0%	1	0.9%
Little Berland	1	1.3%	1	0.9%
Rock Lake	24	30.4%	77	66.4%
Sulphur Gates	48	60.8%	23	19.8%
Victor Lake	1	1.3%	0	0.0%
	79	100.0%	116	100.0%



#### 4.1.2.3.4 Main Activity

Forty-six percent of respondents identified hiking as their main activity during their trip, though horse-riding was also a common activity (28%) (Table 18).

**Table 18. Main Trip Activity**

<b>Main Activity</b>	<b>Number</b>	<b>Percent</b>
Biking	5	2.6%
“Burning daylight”	1	0.5%
Climbing	5	2.1%
Fishing	4	2.1%
Fun	1	0.5%
Gather information for future trip	1	0.5%
Health and fitness	1	0.5%
Hiking	89	45.9%
Horseriding	55	28.4%
Hunting	16	8.2%
Job-related	2	1.0%
Passport to the Peaks	1	0.5%
Photography	3	1.5%
Sightseeing	7	3.6%
Wildlife viewing	3	1.5%
	194	99.5%

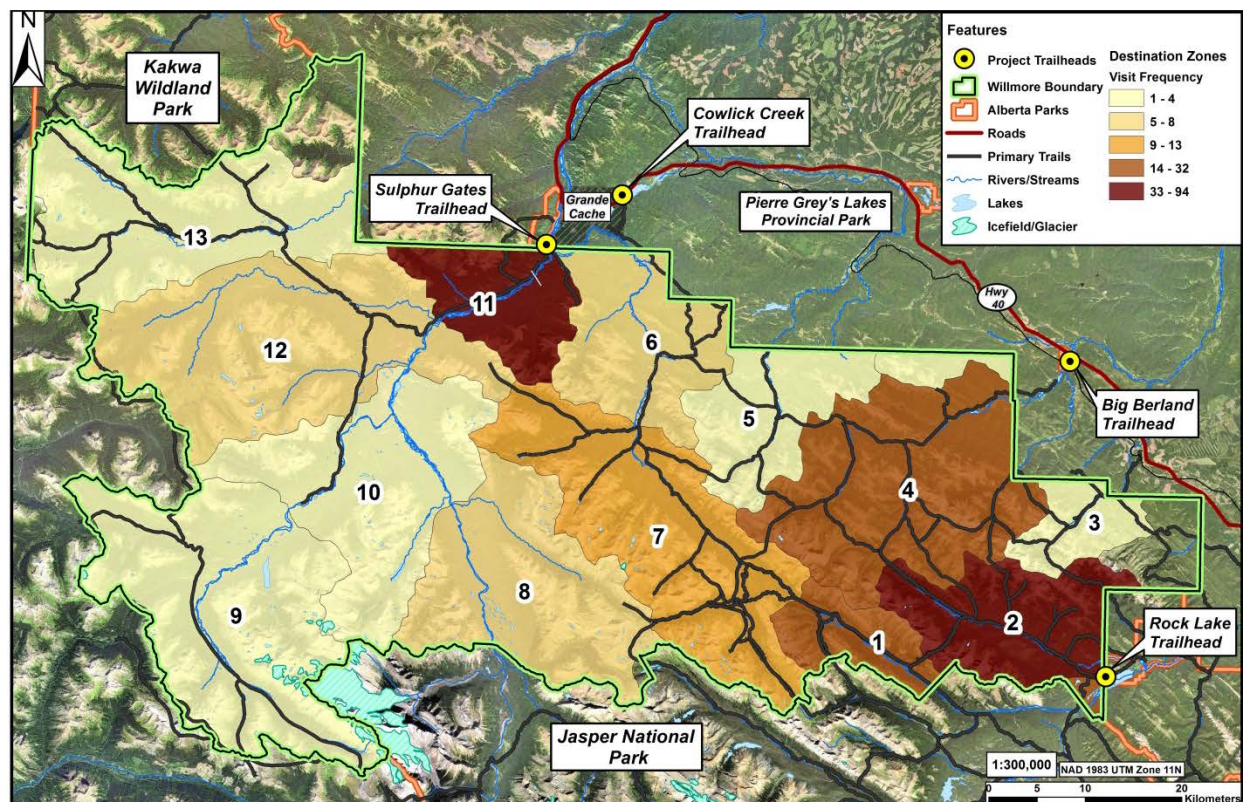
*Note.*  $n = 194$ . Some users had indicated more than one activity. Only the first activity was used in analysis.

#### 4.1.2.3.5 Trip Destination Zones

To gather trip destination information, survey respondents were asked to either trace (on an attached survey map) or to list the trails and campsites that they used or intended to use. Willmore Wilderness Park was initially delineated into 15 zones that were derived from watershed delineations of the park<sup>1</sup>. From the trip descriptions or sketches provided, a broad-scale map of destination zone usage for Willmore was created based on the summation of the frequency of trip occurrences within a particular zone. For example, if a respondent indicated they hiked to Eaton Falls, then one occurrence was coded to the corresponding zone (zone 11). The number of zone destinations indicated by respondents ranged from one to seven zones for an individual trip description. This resulted in a frequency of one to 94 within a total of 13 zones (zones with a zero frequency were not included in the final map). The most popular zones utilized by respondents were zone two (adjacent to Rock Lake staging area) and zone eleven

<sup>1</sup> Watershed delineations were created by Julie Duval, Foothills Research Institute for the Foothills Stream Crossing Partnership.

(Sulphur Gates Staging area) (Figure 30). This corresponded to the highest use staging areas identified by the trail camera data in this study. The next highest use zone was zone four which was accessible through both the Rock Lake and Big Berland staging areas (Figure 30). The proportion of usable or effective land area differs between wilderness areas (Dawson & Hendee, 2009). Though the physical size and space of Willmore is available to visitors, it appears that only certain areas of Willmore were used. The amount of usable land for visitors can be related to steepness of slope, vegetation types, number and sizes of water bodies and rivers, wetlands, degree of access development, number of trails, and travel routes (Dawson & Hendee, 2009). In Willmore, generally there is low trail maintenance, and trail maintenance can be non-existent in many areas of the park. Trails that might have existed historically may be lost as they are becoming overgrown with vegetation. There are some areas of the park where there are no major trails or where travel is difficult due to the non-maintenance of trails. Few trails exist in the central, south-western portion of Willmore which coincides with these zones (zone 8, 9, 10) having low destination use (Figure 30). It should be noted there were few survey respondents



**Figure 30. Visitor Destination Zones of Willmore**

*Note.* Watershed zones that had a zero frequency were not included.

that reported trips into the west side of the park. Bias may have been present as people who visited the west side were not represented in this sample. The results from the destination zones of the park are valuable in helping to determine where park resources should be focused. For example, park staffing, patrols and trail maintenance can be focused within these areas as they appear to be the more popular zones. Visitor experience and park stewardship activities should be focused on these zones (e.g., crowding, campsite management-firewood, and overgrazing).

Route information collected from the trail surveys were not analyzed at a fine scale due to a variety of reasons. First, Willmore is large in physical size (4,597 km<sup>2</sup>) which made it difficult to collect fine-scale route information through a non-digital survey-based mapping approach. It was a challenge to fit Willmore into a discernible survey map that could be packaged along with the trail survey. When mapping landscape values or special places, Brown (2005) indicated that the selection of the map type, size, color, scale, layers, and general readability were critical in determining the success of the mapping approach. The map utilized in the 2009 Willmore surveys was too small in size and had low readability. This resulted in the map size being increased from 8.5" x 11" to 11" x 17," the map being printed in color, and additional identifying layers and labels added. It was also found that the survey maps were a popular collector's item. Quite a few trail surveys were returned without the map being attached. This may indicate the need for more readily available maps of Willmore for visitors.

Previous research has identified that traditional methods used to gather trip information (e.g., survey itineraries, trip diaries etc.) may exhibit inaccuracies, potential bias, or deficiencies in the validity of the data (Shoval & Isaacson, 2007; Hallo, Manning, Valliere, & Budruk, 2005). For example, respondent recall can be a source of error for gathering trip information especially when detailed information is requested (Wolf et al., 2012). Visitors for example may not always be aware, familiar, and knowledgeable of the study area or be able to recall where they visited and the length of time they spent in each location (Tchetchik, Fleischer, & Shoval, 2009; D'Antonio et al., 2010). In general, there were few accurate, recent, and detailed maps of Willmore readily available to the public. It was possible that some respondents were not familiar with the park or they may not have the ability to read maps. First-time park users may not have been aware of their location or that they were inside the park; this would have made it difficult for them to sketch or describe where they were located or where they were planning to travel. Considering the size of Willmore, it would have introduced high visitor burden for visitors to

accurately record their entire trip in the detail required for in-depth trip analysis from map sketches. In addition, Willmore did not have a comprehensive GIS trail layer, so detailed analysis would have required a more comprehensive and detailed trails layer.

#### **4.1.2.3.6 Comparison with Past Willmore Recreation Studies**

Table 19 provides a summary that compared select trip and visitor characteristics with five previous Willmore recreation survey studies. Given the limitations with self-administered surveys (i.e., potential low participation by stock users) these studies provided interesting insight into characteristics of park visitors as snapshots in time. Response rates for self-registration have been variable through these studies with compliance only being confirmed in the 1982 study. McFarlane and Watson (1998) noted in their study that registration by horse users appeared low.

With the exception of the 1981 study, Rock Lake was consistently the most popular staging area. The popularity of Big Berland as a destination zone had decreased while Rock Lake and Sulphur Gates continued to be popular staging areas. Trip length appeared to be steady with a slight decrease in 2010 from what was recorded in 1981 and 2009. All studies indicated visitors to Willmore mainly travelled in groups. Average group size had remained steady with an average size between three and four people. The exception was 2009, where the average group size was slightly larger. In all of the studies, group composition was dominated by friends or family. Hiking and horse-riding have remained the most popular activities, while mountain-biking though it appeared less popular, emerged as an activity in 2009. Hiking had consistently been the dominant travel mode, but this could have been a reflection of more hikers completing surveys than horse-riders (i.e., it may have been easier for hikers to complete a survey than horse riders and some user types may be more likely to complete surveys than others). Fishing appeared to have decreased in popularity through time. Hunting appeared to have been decreasing in its popularity from earlier studies, though this may have been a result of commercial hunting groups or hunters not completing self-registration or self-administered surveys. In Alberta, hunter numbers have been in steady decline since the early 1980s (Boxall, Watson, & McFarlane, 2001). Boxall et al. (2001) examined the demographics of Alberta hunters during the provincial decline from 1990-1997. The researchers determined that the decline in hunting was likely to continue (i.e., decline in new recruits to hunting and new recruits are not being retained), gender appeared as contributing factor in the decline (i.e., the number of female hunters had declined),

and age appeared to relate to the probability of being recruited to hunting and also to cease hunting (Boxall et al., 2001). In general, Willmore remained a popular destination for Albertans, with many visitors originating locally or from Edmonton and surrounding communities. A majority of visitors were repeat visitors and this appears to have remained fairly stable over time. Gender was collected in 2009 and 2010 and more males visited Willmore than females.

**Table 19. Visitor and Trip Attribute Comparison with Previous Willmore Studies**

Attribute	1981 Study <sup>a</sup>	1982 Study <sup>b</sup>	1998 Study <sup>c</sup>	1999 Study <sup>d</sup>	2009 Study <sup>e</sup>	2010 Study <sup>f</sup>
<b>Response Rate</b>	91 Groups 285 Individuals	175 Groups 717 Individuals	91 Groups 274 Individuals	66 Groups 199 Individuals	59 Groups 248 Individuals	195 Groups 731 Individuals
<b>Trip Entry Point</b>	Big Berland <sup>g</sup> - 44% Rock Lake <sup>g</sup> - 28% Sulphur Gates <sup>g</sup> - 29%	Big Berland <sup>g</sup> - 15% Rock Lake <sup>g</sup> - 60% Sulphur Gates <sup>g</sup> - 20% Victor Lake <sup>g</sup> - 1%	Big Berland - 12% Rock Lake - 58% Sulphur Gates - 29%	Big Berland - 6% Rock Lake - 83% Sulphur Gates - 11%	Cowlick Creek - 2% Rock Lake - 88% Sulphur Gates - 10%	Big Berland - 7% Cowlick Creek - 2% Jasper National Park - 1% A la Pêche Lake - 1% Little Berland - 1% Rock Lake - 52% Sulphur Gates - 36% Victor Lake - 1%
<b>Destination Zone</b>	Big Berland - 30% Rock Lake - 21% Sulphur Gates - 28%	Big Berland - 16% Rock Lake - 27% Sulphur Gates - 21%	Not collected	Not collected	Not collected	Big Berland - 12% Rock Lake - 36% Sulphur Gates - 23%
<b>Trip Length</b>	Ave. - 5.2 days	Ave. - 4 days	Ave. - 5.5 nights	Ave. - 4.4 nights	Ave. - 6.9 nights	Ave. - 4.6 nights
<b>Trip Type</b>	Day - 30% Overnight - 70%	Day - 28% Overnight - 72%	Day - 33% Overnight - 67%	Day - 14% Overnight - 86%	Day - 26% Overnight - 74%	Day - 40% Overnight - 60%
<b>Group Type</b>	Group - 93 % Solo - 7%	Group - 86% Solo - 14%	Group - 89% Solo - 11%	Group - 85% Solo - 15%	Group - 92% Solo - 8%	Group - 90% Solo - 10%
<b>Group Size</b>	Ave. 3.1	Ave. 4	Ave. 3.1	Ave. 3.1	Ave. 4.6	Ave. 3.8
<b>Group Composition</b>	Friends - 66% Family - 23% Outfitter - 8% Other - 3%	Friends - 48% Family - 41% Outfitter - 6% School - 5%	Friends - 38% Family - 39% Alone - 12% Family & friends - 6% School - 5% Other - 1%	Friends - 45% Family - 22% Alone 16% Family & friends - 11% School or youth - 2% Other - 5%	Friends - 49% Family - 49% Outfitter - 5% Other - 5%	Friends - 46% Family - 32% Spouse/partner - 32% Solo - 8% Other - 11%
<b>Activity</b>	Hunting - 16% Fishing - 27% Hiking - 26% Photography - 18% Trail riding - 12%	Hunting - 15% Fishing - 25% Hiking - 49% Photography - 37% Trail riding - 25%	Hunting - 7% Fishing - 22%	Hunting - 3% Fishing - 14%	Fishing - 19% Hiking - 69% Photography - 56% Trail riding - 25% Sightseeing - 69% Mountain biking - 6%	Hiking - 46% Trail riding - 28% Hunting - 8% Sightseeing - 4% Mountain biking - 3% Other - 11%
<b>Travel Mode</b>	Hiking - 60% Horse - 40%	Not recorded	Hiking - 65% Horse - 19% Mountain bike - 17%	Hiking - 80% Horse - 13% Mountain bike - 8%	Hiking - 57% Horse - 37% Mountain bike - 5% Wagon - 2%	Hiking - 62% Horse - 39% Mountain bike - 2% Wagon - 1%
<b>Origin</b>	Alberta - 93% British Columbia - 1% Saskatchewan - 1% U.S.A. - 5% Edmonton - 31%  Near communities - 23% Other - 46%	Alberta - 91% British Columbia - 2% Other Provinces - 4% U.S.A. - 2% Europe - 1%  Edmonton - 36% Near communities - 23% Other - 41%	Alberta - 91% Other provinces - 5% U.S.A. - 5% Edmonton - 26% Near communities - 15% Other - 59%	Alberta - 86% Other provinces - 9% U.S.A. - 5% Edmonton - 30% Near communities - 8%  Other - 62%	Alberta - 86% Other provinces - 4% U.S.A. - 4% International - 6% Edmonton region - 47%  Near communities - 13% Other - 40%	Alberta - 90% Other provinces - 10% U.S.A. - 2% International - 3% Edmonton region - 27%  Near communities - 18% Other - 56%
<b>Previous Park Visits</b>	First-time - 44% Repeat - 56%	First-time - 37% Repeat - 63%	First-time - 41% Repeat - 59%	First-time - 34% Repeat - 66%	First-time - 34% Repeat - 66%	First-time - 39% Repeat - 61%
<b>Park Visits 12 Months</b>	Not collected	Not collected	Not collected	Not collected	First-time - 27% Repeat - 73%	First-time - 56% Repeat - 45%
<b>Age</b>	Not collected	Not collected	Not collected	Not collected	0 to 9 - 1% 10 to 19 - 23% 20 to 29 - 26% 30 to 39 - 17% 40 to 49 - 16% 50 to 59 - 14% 60 Plus - 2%	9 and under - 2% 10 to 19 - 11% 20 to 29 - 18% 30 to 39 - 15% 40 to 49 - 16% 50 to 59 - 24% 60 and over - 13%
<b>Gender</b>	Not collected	Not collected	Not collected	Not collected	Female - 32% Male - 64% Unknown - 4%	Female - 49% Male - 51%
<b>Compliance</b>	Not determined	66%	Not determined	Not determined	Not determined	Not determined

<sup>a</sup> O'Brien, S. (1982). *Willmore Wilderness Park recreation user study: 1981 Season*. Edmonton, AB: Alberta Forest Service

<sup>b</sup> O'Brien, S. (1983). *Willmore Wilderness Park recreation user study: 1982 Season*. Edmonton, AB: Alberta Forest Service

<sup>c</sup> McFarlane, B. L., & Watson, D. O. (1998). *Willmore Wilderness Park: Voluntary self-registration system 1998*. Edmonton, AB: Canadian Forest Service, Northern Forestry Centre, Socio-economic Research Network

<sup>d</sup> McFarlane, B. L., & Watson, D. O. (1999). *Willmore Wilderness Park: Second year (1999) of the voluntary self-registration system*. Edmonton, AB: Canadian Forest Service, Northern Forestry Centre, Socio-economic Research Network

<sup>e</sup> Alberta Tourism, Parks, and Recreation. (2009). [2009 Willmore Wilderness Park visitor survey]. Unpublished raw data. Data was collected through in-person observation/interviews and surveys and was analyzed for use in this table. Not all of the same attributes were collected through both methods.

<sup>f</sup> Mucha, Debbie. (2013). *Acquiring an improved understanding of Willmore Wilderness Park visitors, Alberta, Canada* (Master's thesis). University of Alberta, Edmonton, Alberta, Canada

<sup>g</sup> Average percent was calculated for groups and individuals combined.

*Note*. Studies had survey stations operational for varying durations. Percentages are rounded in some cases and not all results from each study are summarized. Some percentages add up to greater than 100% as more than one response could be provided. Outfitters were underrepresented in all studies. Other historic recreation studies may exist for Willmore but were not located for inclusion. Near communities include: Grande Cache, Brule, and Hinton.

### **4.1.3 Global Positioning System (GPS) Tracksticks/Survey Packages**

#### **4.1.3.1 Trackstick Distribution**

A total of 29 GPS Tracksticks were cycled through GPS Trackstick survey packages. These were distributed from June 24th, 2010 until September 18th, 2010. In total, 31 GPS Trackstick packages were distributed to participants out of the 49 packages that were available through the various distribution types. Table 20 summarizes the results of GPS Trackstick package distribution during the 2010 field season. In total, 24 individual trip tracklogs were successfully collected resulting in a success rate of 77.4% for distributed Tracksticks. A successful tracklog was defined as a discernible trip route (even if sections of the trip route were not captured) that was collected by the GPS Trackstick. In some cases, it was not possible to know what the entire trip route was. This was either because the associated trail survey was not returned along with the GPS Trackstick or there was a missing or a vague trip description described in the trail survey. Four tracklogs did not have an associated trail survey accompanying them when they were returned. Four of the distributed Tracksticks were not successful in collecting any discernible trip data (or no data at all). It appeared the Tracksticks were either not turned on, or they were perhaps improperly carried inside a jacket pocket or backpack. This would have resulted in the Trackstick not being visible to the sky and acquiring clear satellite reception. It should be noted that GPS Tracksticks were not calibrated in the study area (i.e., their horizontal accuracy compared to the locations from a high-accuracy GPS); however Trackstick asserts a 2.5 meter horizontal accuracy (Trackstick, 2007).

**Table 20. Summary of GPS Trackstick Package Distribution ( $n = 24$ )**

<b>Distribution Type</b>	<b>Actual Number Distributed</b>	<b>Actual Number Used</b>	<b>Successful Tracks Obtained</b>	<b>Lost</b>
Given to park users ahead of time for trips	7	1	1	2 <sup>a</sup>
Switzer Park Visitor Information Centre	5	2	1	1 <sup>b</sup>
Hinton Visitor Information Centre	1	1	1	0
Grande Cache Tourism and Interpretive Centre	2	1	1	1 <sup>c</sup>
Willmore Wilderness Foundation Office	2	0	0	0
Rock Lake trailhead distribution	17	17	14	2 <sup>d</sup>
Sulphur Gates trailhead distribution	14	9	6	0
<b>Total</b>	<b>48</b>	<b>31</b>	<b>24</b>	<b>6</b>
<b>Percentage</b>			<b>77.4%</b>	

*Note:* Six Tracksticks were lost in total, but two were recovered and returned to inventory resulting in a total of four lost Tracksticks at the end of the field season. Recovered Tracksticks may have been lost before they had an opportunity to collect a successful tracklog.

<sup>a</sup> Two Tracksticks were given to users much ahead of their trip and were lost prior to the trip.

<sup>b</sup> Trackstick was recovered and returned by a Rock Lake trail user. A successful tracklog was not collected.

<sup>c</sup> Trackstick was lost or stolen at the information centre.

<sup>d</sup> One Trackstick was recovered and returned by a Rock Lake trail user. A tracklog was present but was accidentally overwritten upon subsequent download so the success of the tracklog was uncertain. The second Trackstick was permanently lost on the trail.



D'Antonio et al. (2012) found the data capacity and battery life of the GPS units they used in their study to be limiting factors for extended backcountry trips. In this Willmore study, it was difficult to determine if these were limiting factors for the Super Trackstick. This was because there were few Tracksticks that were turned on for the entire duration of an extended multi-day trip (e.g., seven days). The true trial would be to test the Trackstick on a long trip (e.g., 12 day trip) where it is left on the entire duration versus just turning the unit on during trip travel time. Due to cost, alkaline batteries were used to power the Tracksticks. Tracksticks can also use NiMH and Lithium batteries which should result in longer operation. The GPS Trackstick had a vibration detector meaning if the unit was left on and it detected no movement, it would go into sleep mode (which is a low power mode). Users were also provided a spare set of batteries for extended trips. The capacity of the tracking unit should be considered and tested on extended multi-day trips. The advertised capacity for the unit is 4 Mb flash memory which is claimed to store months of location data (Trackstick, 2007). For most trip durations data capacity should not be an issue.

In this study, the main challenge was that users did not have their tracking devices turned on for the entire duration of their trip. In some cases, it appeared the tracking devices were turned off and the users forgot to turn them back on. This was common if the user had turned the unit off during the night or during a stop or period of rest. Some users did not turn the tracking unit on at the very beginning of their trip, but turned them on after a certain distance. Perhaps they forgot about the tracking device and remembered it further down the trail. It was common for users to have the tracking device turned on for the departure or early portion of their trip but not for their return trip. This was possible to determine through the associated Trackstick Manager software once the Trackstick file was opened. The file could be examined to see when the GPS Trackstick was turned on and to view the associated satellite fixes of the locations. In addition, the tracklog and point locations could be viewed in Arcmap software to assist with evaluating data gaps. It was possible that not precise enough instructions were provided to the participants to record their entire trip route or perhaps for some reason they did not want to record their entire trip. Recorded trip lengths from GPS Tracksticks were compared against corresponding surveys, and in many cases, the GPS Trackstick trip length was shorter than the trip length reported on the trail survey. It is speculation as to why some users turned off the Trackstick for short periods during the trip. For example, one trip route had a missing gap that

occurred both on the way into Willmore and on the way out. The unit had been turned off and on in both directions in a very similar location resulting in a gap. This gap was approximately 1.5 km in length. Perhaps it was coincidence the unit was not turned on for that portion or the user had a specific reason that they did not want the locations recorded. There could also be other reasons for turning the unit off including: forgetting to turn it on after a break, being worried about battery life or having to change the batteries, or not wanting their GPS locations to be captured (e.g., hunting locations, special spots, etc.). Though the device is a seemingly small burden, perhaps it is burden enough in some instances.

Past studies have found GPS units to function poorly in dense forest canopy cover or complex terrain (Hallo et al., 2005; Hallo et al., 2012; Lai et al., 2007; Rettie, 2012). GPS antenna technology has greatly improved depending on the GPS model, so these challenges did not appear to be an issue as long as the user carried the tracking unit so it was visible to the sky. GPS antenna technology will continue to evolve into the future, so this may not be so much of a future consideration if the model of unit is carefully selected. D'Antonio et al. (2010) found that signal reception was not significantly affected overall at their three study sites which consisted of a variety of terrain types (e.g., high-elevation meadows, large cirque walls, dense to sparse tree cover, steep open slopes, and deep canyons). The areas where users travelled with their GPS Tracksticks in Willmore consisted of varied terrain including forested valley bottoms, mountainous terrain, and wide open ridges. Few tracklogs exhibited jagged or erratic point collection which is usually associated with the GPS not being able to collect 3D satellite fixes due to dense canopy or other multi-path errors (e.g., mountain cliffs etc.). Where there appeared to be multi-path error, it was difficult to determine if the terrain or canopy were factors, or if the tracking device was being carried improperly by the participant. At Rock Lake, most users travelled to the Eagles Nest area which has a wide and open trail with moderate canopy and open valley bottoms with areas of dense and high willow growth.

There were no known refusals from participants that were asked to use a GPS Trackstick, though there were some refusals by hunters during hunting season when asked to complete a trail survey. These users were not asked to carry a track recorder since they had refused the survey. The refusal by some hunters to complete a trail survey is not surprising as some hunters may be sensitive about divulging information about where they hunt. GPS devices have been utilized in

previous studies to monitor the movement patterns of hunters (Brøseth & Pedersen, 2000; Lyon & Burcham, 1998; Stedman et al., 2004). In these studies it was not identified that hunters were sensitive to having their locations tracked, however Brøseth and Pedersen (2000) only distributed GPS units to the hunters of two teams and not a sample from the general public. Therefore, a relationship of trust may have already been present with their participants. The study also had a goal of evaluating the use of GPS in determining hunting effort. Stedman et al. (2004) used an intensive communications approach prior to the start of their field study to inform the public about the study and to garner study awareness. This included news releases through radio and newspapers, project mail-outs to hunting camp lessees, and to all residents of the community local to the study area. In addition, they attended a hunting stakeholder meeting just prior to the start of hunting season. The researchers also used check-point stations to stop vehicles entering the road to the study area and uniformed conservation staff requested drivers to participate in the study. Study personnel also visited hunting camps within the study area to request study participation. Stedman and others has strong participation from hunters and only had 11 refusals to use a GPS unit; otherwise 340 hunters had collected useable tracklogs for the study.

In Willmore GPS Tracksticks that were issued by a field assistant were all recovered. They were either returned at information centres, trailhead drop boxes, or through the mail. The exception was one Trackstick that was permanently lost on the trail by a Rock Lake user. D'Antonio et al. (2010) pointed out that it was important in complex trail systems to have project personnel or drop boxes located at all possible exit locations to ensure a high return rate of GPS units. A total of six GPS Tracksticks were lost throughout the summer, two of which were recovered on the trail by other users and returned back to project personnel (the Tracksticks had a contact phone number written on them). Four units were permanently lost. The four lost units resulted in an 87.1% return rate. Two Tracksticks were lost by users who were issued the GPS Tracksticks ahead of time for their planned summer trip. The two Tracksticks were misplaced before they even had an opportunity to be used on the trip. One GPS Trackstick was lost or removed from the Grande Cache Tourism and Interpretive Centre and one other Trackstick was lost during a trip at the Rock Lake staging area. One local user group who accepted Trackstick packages to distribute at their office or to use for their own trips did not seem interested in using or promoting the Trackstick packages. When Trackstick packages were retrieved, they were unopened and none of the project information appeared to have been reviewed. This group later

stated they did not support the project though initially they had supported it so this possibly explains why no effort was made. For Willmore, to increase participation by hunters and commercial operators, a similar approach to Stedman et al. (2004) is recommended. These researchers also noted that participation by hunters in GPS studies can be voluntary, though study participation may be made a requirement of being able to hunt in the study area or being a member of a hunting club.

As previously, described in the Methods Chapter, GPS Tracksticks were distributed in a package also containing a trail survey. The associated survey and GPS Trackstick attributes were combined to derive detailed trip information. Users who utilized a tracking device on their trip were mainly overnight users who were hiking as a main travel mode (Table 21).

**Table 21. Trip Type and Travel Mode of GPS Trackstick Users**

<b>Trip Type</b>	<b>Number</b>	<b>Percent</b>
Day	6	25
Overnight	18	75

<b>Travel Mode</b>	<b>Number</b>	<b>Percent</b>
Horse	3	12
Hiking	17	71
Unknown	4	17

It could be speculated that the majority of Tracksticks were distributed to hikers as they may have appeared more approachable. Horse users are often busy getting their stock and gear ready for the trip. Commercial horse users may also have clients, so the field assistant may have felt awkward approaching a commercial group. Perhaps more hikers were present during the time when Tracksticks were being distributed on weekends.

#### **4.1.3.2 Spatial Distribution of Visitor Use**

Each Trackstick was downloaded and processed as described in the Methods Chapter. This resulted in both line and point feature classes that were stored within an ArcGIS 10.1 geodatabase. Table 22 summarizes selected summary statistics of the GPS Trackstick data (points and lines).

**Table 22. Summary of Selected GPS Trackstick Trip Route Characteristics (n = 24)**

Attribute	Min	Max	Mean
Route length (km)	5.96	76.13	32.76
Trip duration (min)	95	12,778	2,052
Number of stops	1	148	40
Speed (km/hr)	1	9	4

*Note.* The trip duration includes stopping times and is dependent on if or when the unit was turned off and on. Speed does not include recordings of 0 km/hr or stopped locations. 51,609 total points were collected.

From the 24 successfully acquired GPS tracks, general spatial distributions were mapped for the Sulphur Gates (Figure 31) and Rock Lake (Figure 32) staging areas. Only one track was collected for the Cowlick Creek staging area (Figure 33) and no tracks were collected for the Big Berland staging area. Point data obtained from the GPS Tracksticks were used to derive visitor use densities through kernel density analysis in ArcGIS 10.0 for the Sulphur Gates (Figure 34) and Rock Lake staging areas (Figure 35). Kernel density analysis is a type of GIS analysis that calculates a magnitude per unit area from point or polyline features using a kernel function to fit a smoothly tapered surface to each point or polyline (ESRI ArcGIS 10.1 help). The kernel density analysis of the visitors that had Tracksticks at Rock Lake showed that the highest density of user points occurred from the Rock Lake staging area to the Eagles Nest Pass area. D'Antonio et al. (2010) noted that high user densities may result from overall high use levels or users remaining in an area for a period of time. Areas of high density may indicate locations that are at risk of environmental impacts or diminished visitor experience through crowding or conflict D'Antonio et al. (2012). Dawson and Hendee (2009) mentioned it is common to have the heaviest visitor use along a few miles of trail and that use patterns are generally related to trails. Certain users may have differing travel patterns. Horse users tend to have more concentrated travel patterns in comparison to hikers (Dawson & Hendee, 2009). This would be interesting to have investigated in greater detail, however, a comparison was not possible since the sample of Trackstick users were mainly hikers. Perhaps travel patterns in and around Eagles Nest were related to trail condition (i.e., overgrown willows, campsite availability, water sources and grazing), but this would need to be investigated further. Hikers for example may do ridge walks, but might have a base camp since there is not usually water sources on top of the ridges other than snowmelt during certain times of the year. The overgrowth of willows may also make travel for hikers less enjoyable and increase the probability of a bear encounter due to reduced



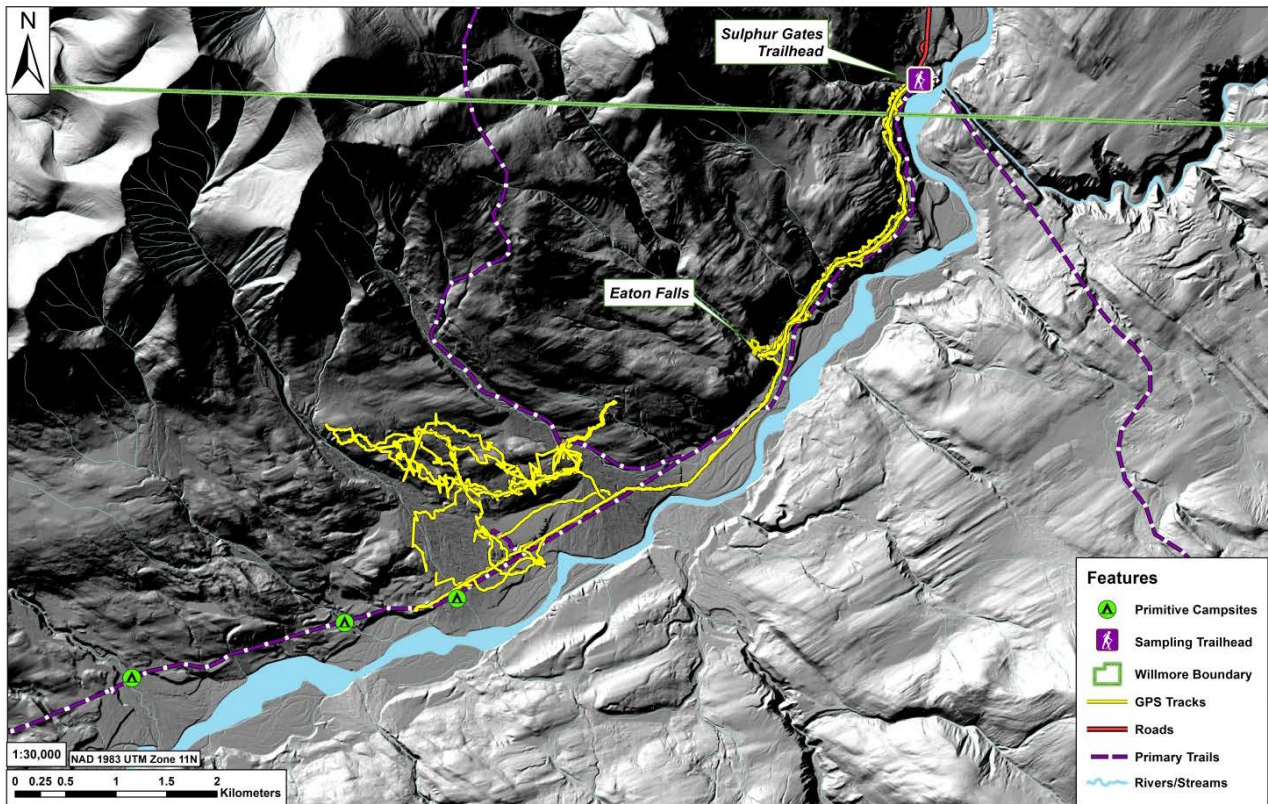


Figure 31. General Overview of GPS Tracks for the Sulphur Gates Staging Area

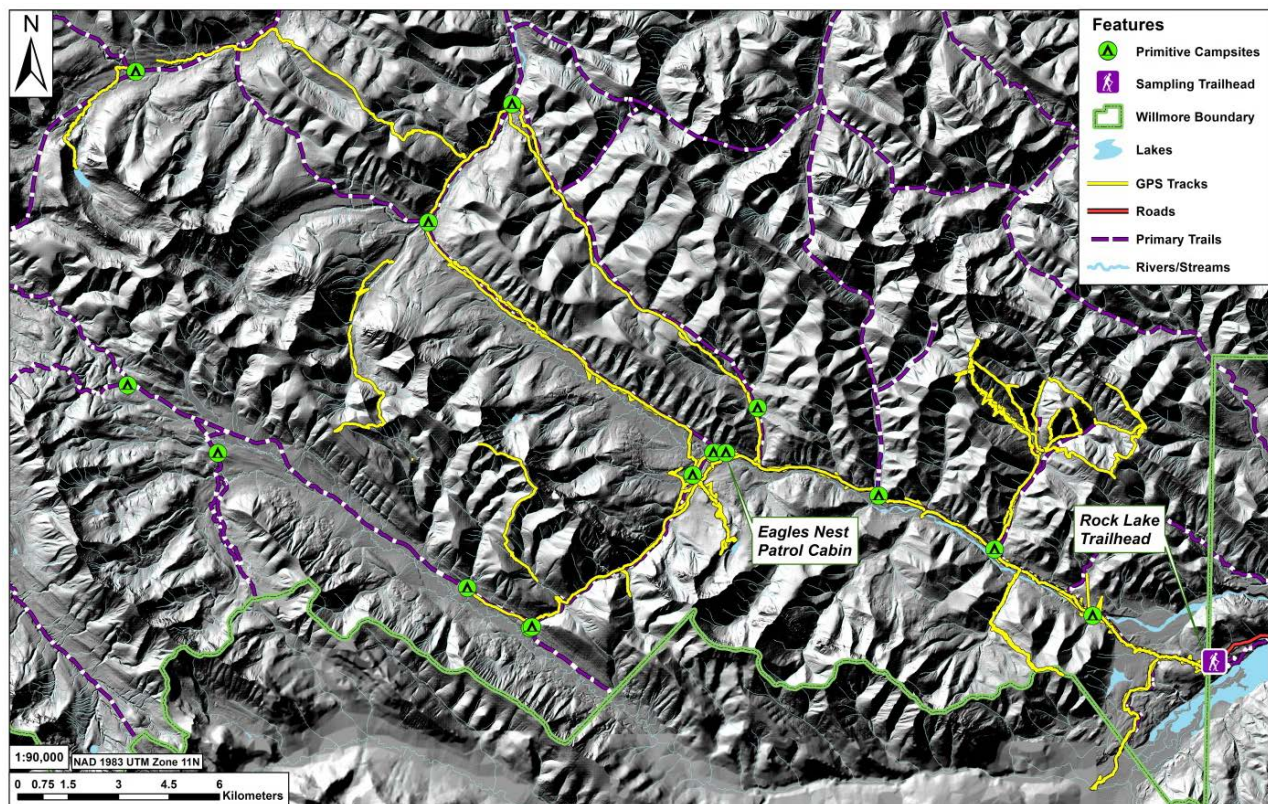
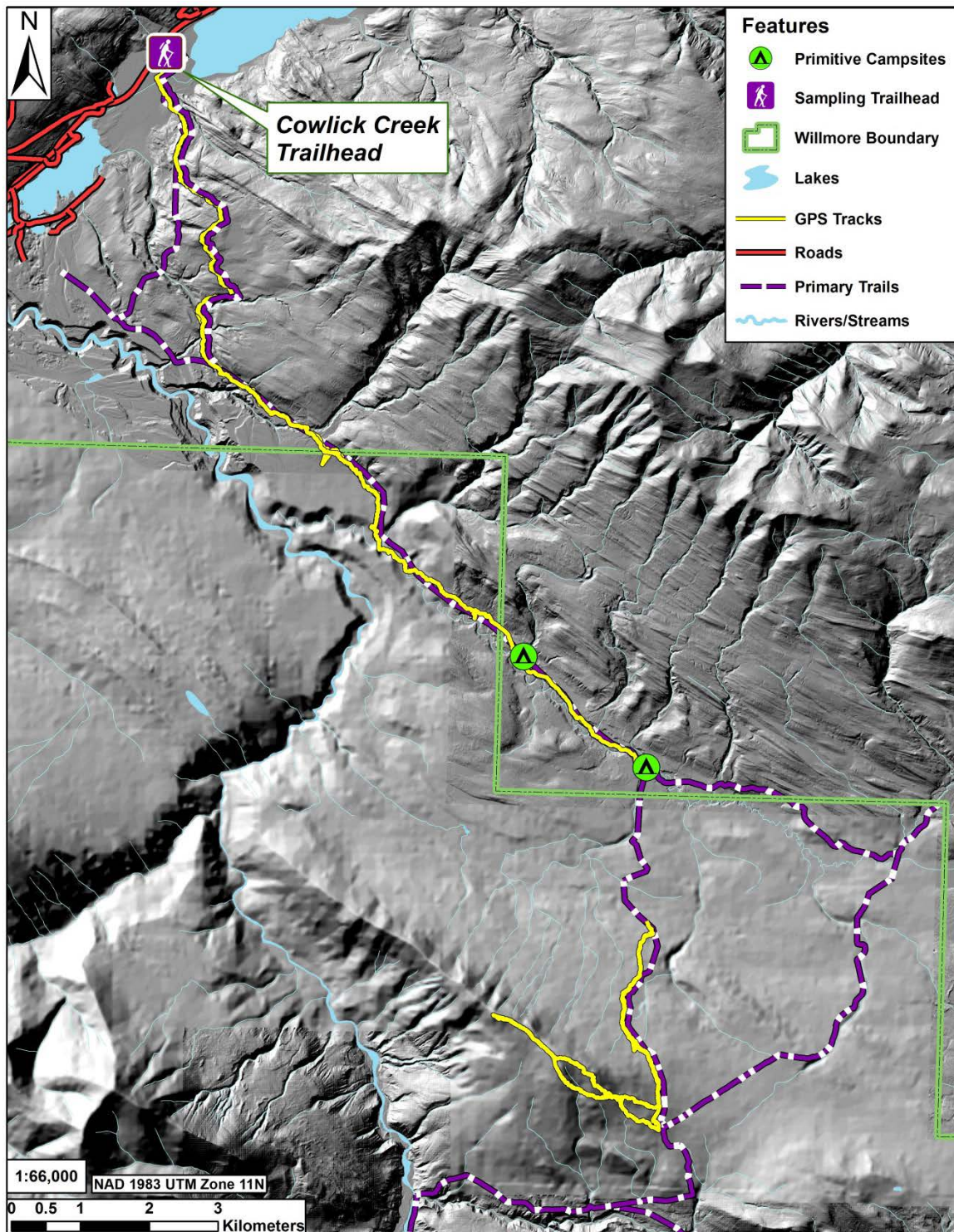


Figure 32. General Overview of GPS Tracks for the Rock Lake Staging Area





**Figure 33. Summary of GPS Tracklog Points for Cowlick Creek Staging Area**



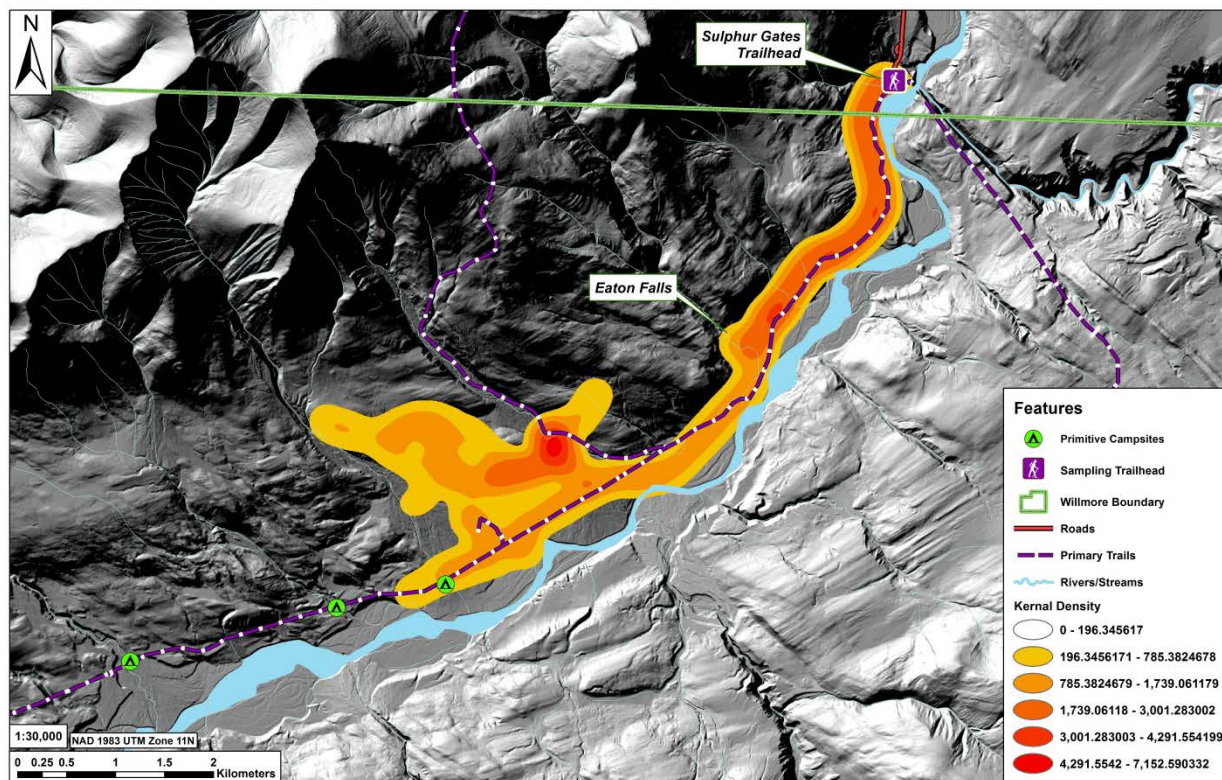


Figure 34. Kernel Density Analysis of Sulphur Gates GPS Tracking Points

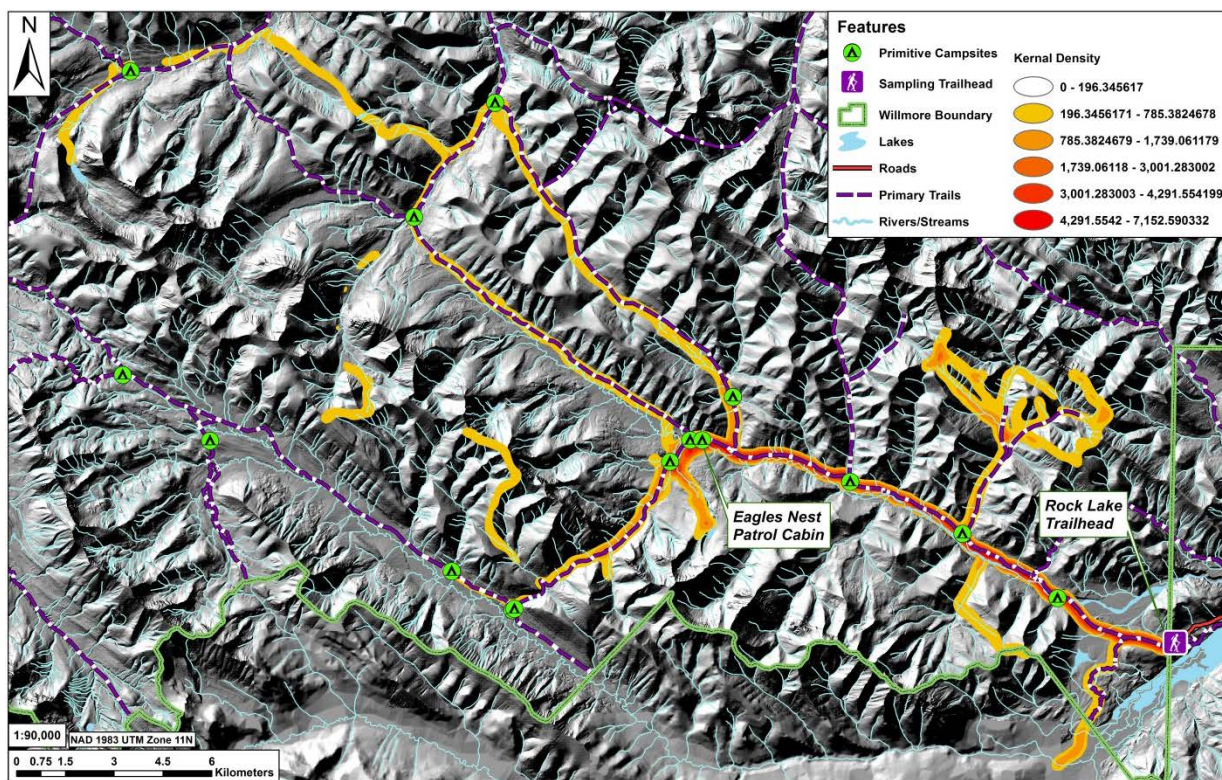


Figure 35. Kernel Density Analysis of Rock Lake GPS Tracking Points



visibility. Travel patterns may also vary seasonally. For example, patterns may vary during hunting season compared to earlier in the season. According to self-registration surveys from the late 1990s, the most popular trails in Willmore were: Mountain Trail, Eagle Nest Pass, Smoky River, Berland, and Willow Creek/Snake Indian Pass in 1998 and Eagle Nest Pass, Berland, Mountain Trail, and Pope Thoreau Pass in 1999 (McFarlane & Watson, 1998, 1999). In general, wilderness recreational use is unevenly distributed (Dawson & Hendee, 2009). The geographical density of use may also be further concentrated during peak seasons (e.g., summer) and weekends (e.g., long weekends) which in some areas may pose associated stewardship opportunities and challenges (Dawson & Hendee, 2009). Depending on the social and environmental carrying capacities of the area, some locations such as the high alpine may be more prone to physical and visitor experience impacts (e.g., solitude or escape) (Dawson & Hendee, 2009). These areas may become the focus of stewardship efforts and education, or in some highly impacted areas focus on the redirection, dispersing or limitation of use.

#### **4.1.4 In-Depth Mail Survey**

##### **4.1.4.1 Response Rate**

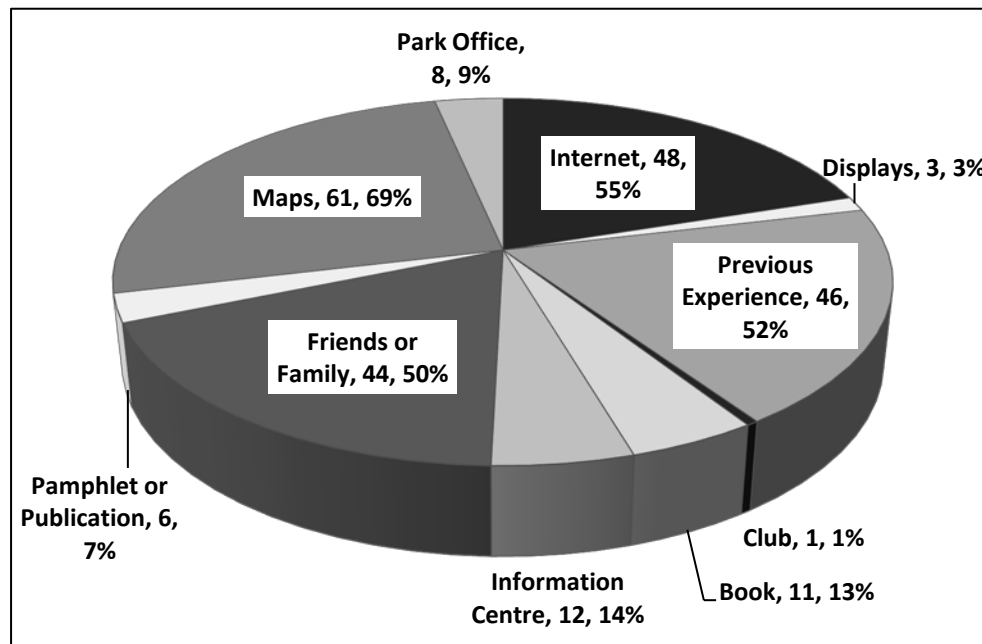
There were a total of 85 in-depth mail surveys completed by study participants resulting in a response rate of 89%. A high response rate was achieved because the participants had agreed previously they were willing to participate in further information gathering about Willmore. It should be noted that the results from this section may not represent or cannot be applied to all visitors to Willmore as it was not a random sample. It is likely that respondents had a personal interest and willingness to invest in Willmore and were therefore more likely to complete a trail survey and subsequent mail survey. It was identified by Crompton and Tian-Cole (1989) through their research that a 70% overall response rate from samples of recreation interest groups was reasonable. Please refer to Appendix J for the in-depth mail questionnaire.

##### **4.1.4.2 Trip Summary**

###### **4.1.4.2.1 Trip Planning Information Sources (Your Willmore Trip)**

Within the first section of the in-depth survey, respondents were asked various questions pertaining to their Willmore trip(s). Specifically, they were gauged on their trip planning and general trip satisfaction. According to Jenkins and Pigram (2003) “information sources and the credibility of the information itself are key issues in the choice of recreation settings, the

activities and their duration, the composition of the group, and perhaps the mode and route of travel to the site” (p. 359). Learning what information sources are used in trip planning can assist parks staff and operators assess the effectiveness of communications media, products and platforms for transferring park information (Papageorgiou, 2001). For Willmore respondents, the most popular sources for trip planning were the following: maps (69%), the Internet (55%), previous experience (52%), and friends and family (50%) (Figure 36). Few respondents indicated that they obtained trip planning information from clubs (1%), displays (3%), pamphlets or publications (7%), or the main park office (9%) (Figure 36). In the Bob Marshall Wilderness, U.S., Lucas (1990) found that wilderness visitors learned about park information (e.g., trailheads) in a variety of ways. He found that studying maps was the most popular method (i.e.,

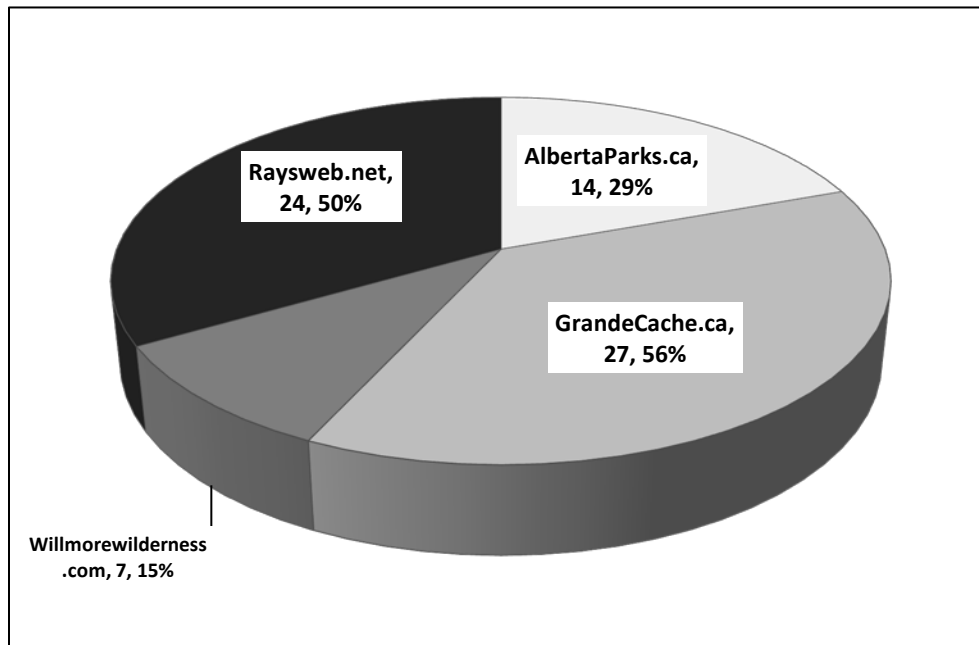


**Figure 36. Trip Planning Information Sources**

*n* = 88. Percentages exceed 100% because respondents could provide more than one answer. Percentages are rounded off. Main park office is located in Hinton, Alberta.

nearly 50% of visitors used maps) along with information from friends and personal knowledge gained from previous trips. It should be noted that this study was from a time period before Internet technology had infiltrated society and daily life. Canadian Travel Market wilderness tourists tended to utilize the following information sources for their trips: the Internet, word-of-mouth, and past experience (Lang Research Inc., 2007). It was also found that these wilderness tourists were above average users of travel-focused media including newspaper travel sections,

magazines, websites, and television travel features and shows (Lang Research Inc., 2007). This segment may have also been effectively communicated through travel magazines and outdoor, nature and science focused magazines, along with jazz and multi-cultural radio (Lang Research Inc., 2007). For Willmore, it appeared the most common publications were maps, which seemed to coincide with their popularity in trip planning. However, existing maps were criticized by some users for their inaccuracies (e.g., out of date data layers such as trails) and their lack of resolution for effective navigation and trip planning. Accurate and reliable maps should be readily available for park visitors since maps appeared to be an important information source. The importance of reliable maps was asserted by Willmore patrolman Harry Edgecombe (1980): “It cannot be stressed too strongly that when travelling in a wilderness area it is important to have an accurate reference to refer to” (p. 18). At the time of this, writing and during this study, there were few current and relevant publications available for Willmore and no recently published guidebooks. This could explain the low usage of pamphlets or publication for trip planning. In general, there has been sparse marketing done for Willmore Wilderness Park through Alberta, Tourism Parks and Recreation. Any marketing efforts for the park seem to have been developed through independent operators who work in the park or through private users that have a passion for the park (e.g., Raysweb.net). The Willmore Wilderness Foundation has some park information ( $n = 1$ , 17%) available on their website; however it appeared to be more focused on hunting, trapping, and traditional use. Other information sources specified by respondents included ( $n = 6$ ): Google Earth ( $n = 2$ , 33%), another person ( $n = 2$ , 33%), and local knowledge ( $n = 1$ , 17%). From the respondents that selected the Internet, GrandeCache.ca (56%) and Raysweb.net (50%) were the most popular websites used in trip planning (Figure 37). Other websites indicated by respondents included ( $n = 7$ ): Google Earth ( $n = 6$ , 7%) and Tom Vinson’s Horseback Adventures ( $n = 1$ , 1%). Past research on information sources used for trip planning by visitors identified that information not directly produced or delivered by the managing agency (e.g., outdoor clubs, professional outfitters, guidebooks etc.) was popular with respondents (Manning, 2011). In Willmore, this suggests that partnering with collaborative private and commercial organizations may be an option for improved information dissemination.



**Figure 37. Websites Used for Trip Planning**

$n = 48$ . Percentages exceed 100% because respondents could provide more than one answer. Percentages are rounded off.

The use of technology (i.e., laptops, desktops, tablets, and smartphones) is a common way for all ages to search for outdoor recreation information through the Internet. The Outdoor Foundation (2012) revealed most U.S. outdoor participants used desktops and laptops to search for outdoor information. However, smartphones seem to hold significant future potential in outdoor recreation and tourism. Not only do they provide an extensive array of information services for pre-trip planning but for wilderness areas may offer potential for post-trip sharing of images, uploading of GPS locations, and information sharing. Wang, Park and Fesenmaier (2012) examined the mediation mechanisms of smartphones through the acquisition of tourists' stories in relation to their smartphone use for travel. Smartphones were found to be a powerful tool for communicating to existing and potential visitors. These researchers asserted that smartphones would become a "dominant force shaping visitor behavior" (p. 384) and tourism related businesses should focus on mobile communications (Wang et al., 2012). "The user of Global Positioning System (GPS) technology and the Internet is changing how we as visitors communicate about and interact with wilderness" (Van Horn, 2007, p. 7). Though cellular tower coverage is limited in Willmore, it is a reality that users still have the capability to use their smartphone for example to collect GPS locations or to record their trip route on their own GPS

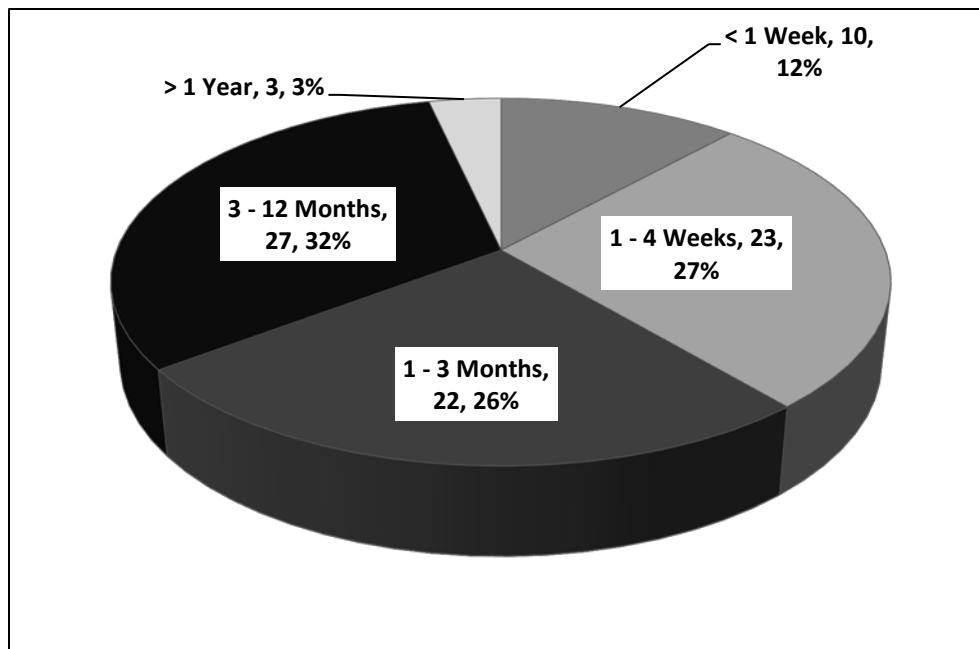
unit. The data from these devices is easy transferable to the Internet for sharing on numerous websites.

Eighty percent ( $n = 66$ ) of respondents indicated there was sufficient information for their Willmore trip planning, while 20% ( $n = 16$ ) indicated there was not enough information. For respondents that felt they did not have enough information for planning their trip, they appeared interested in the ability to have access to or to obtain improved park information. The desire for improved information was evident from the popularity of maps indicated as an information source. It is recommended that online mapping for current and potential visitors be implemented to enhance trip planning information resources for visitors. This could be integrated into a trip planning website that contains such things as: park rules and regulations, leave no trace suggestions, safety messaging, campsite and trail information along with associated conditions and online maps. Crowdsourcing is also becoming a popular way to involve the public, so ways to engage users also hold excellent potential for collecting and disseminating park information. For example, users could indicate on a map where they observed wildlife, indicate the condition of specific trail conditions from their trail. Table 23 summarizes the main emergent themes that emerged from respondents that indicated a lack of information availability. Comments were reviewed and manually grouped into major themes. A majority of the themes surround comments associated with maps, suggested improvement of park information related to trails, campsites, and park activities.

**Table 23. Trip Planning Suggestions Provided by Respondents Summarized by Major Theme (n = 16)**

Major Theme	Example Comment
Improved Information Availability Pertaining to Trails and Campsite Descriptions and Locations	<ul style="list-style-type: none"> <li>• “I would have appreciated more detailed descriptions of the various trails and campsites. Raysweb was the most thorough &amp; precise.”</li> <li>• “The trail information is out of date-trails may have been passable at one time: 20-50 years ago but no longer. Need to identify if they are passable by foot, horse, wagon - how current is information.”</li> </ul>
Improvement in Availability, Quality, and Usability of Maps for Willmore	<ul style="list-style-type: none"> <li>• “A map with current trails, routes and campsites.” “Most sources are written as if you are familiar with the park. Take x creek north to y camp. When x and y don't appear on any maps.”</li> <li>• “Topo maps of trails - more detail, GPS Coordinates.”</li> </ul>
Online Maps of the Park	<ul style="list-style-type: none"> <li>• “The Willmore website said the office was out of stock of maps, what I was hoping to find was a digital .pdf map on the website as I use paper maps so infrequently. I would like to print off my own map.”</li> </ul>
Trail Conditions	<ul style="list-style-type: none"> <li>• “Need better trail condition report for mountain bikes.” “Trail conditions.”</li> </ul>
Descriptions of Non-Horse Activities	<ul style="list-style-type: none"> <li>• “Better Maps.” “Maps of trails &amp; non horse related activities.”</li> </ul>
Pictorial Guide to Park Destinations	<ul style="list-style-type: none"> <li>• “More of a pictorial guide to significant destinations in the park.”</li> </ul>

A majority of respondents (88%) indicated they planned their trip into Willmore at least one week ahead of time with 12% indicating they planned their trip in less than one week prior to their trip (Figure 38). In many national parks, trip planning needs to be done months in advance in order to book certain backcountry campsites. For Willmore, the ability to plan trips with more flexibility and less lead time appears to be an important aspect. Knowing that users did plan their trips in advance reiterates the importance of having clear, simple, and readily available information for park users during the pre-trip planning stage. Lucas (1990) suggested the pre-trip planning stage was important for communicating messaging for minimum-impact practices. Once again, the Internet holds powerful potential for communicating through interactive and engaging media such as images, videos, Internet mapping applications, and mobile applications as previously discussed.



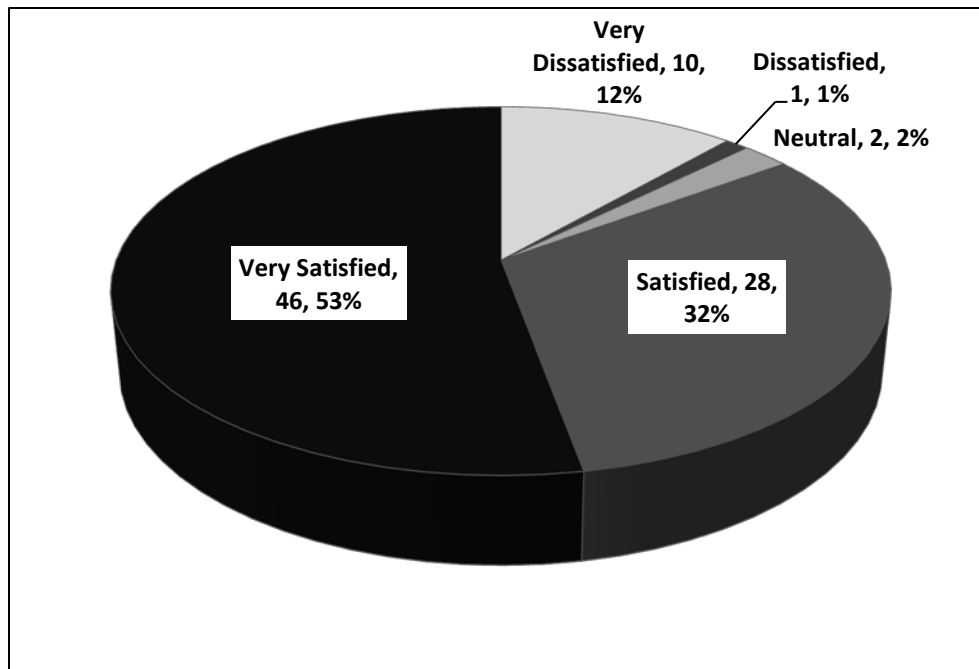
**Figure 38. Advance Trip Planning Time**

*n* = 85. Percentages are rounded off.

Jenkins and Pigram (2003) argued that a lack of information, “or misinformation, can impinge upon environmental perception and constrain the process of discriminating between alternative recreation settings and experiences” (p. 359). When selecting a travel destination for example, it is common for people to select from a sub-set of available alternatives (Jenkins & Pigram, 2003). Essentially travel choices are influenced by perceptions and awareness and often larger, more marketed areas are more probable for trip consideration. “Smaller parks or recreation sites, perceived to have fewer attractions and facilities, or in more remote locations, are less likely to be in an individual’s awareness set” (Jenkins & Pigram, 2003, p. 360). Therefore, if the goal is for people to be aware of Willmore as a possible destination given its remoteness, ruggedness, and low infrastructure, it will be important to provide relevant and accurate park information pertaining to activities, rules and regulations, and other park information (e.g., wildlife, history, and ecology) so that it can become an option for those individuals seeking a wilderness experience.

Survey participants were asked how satisfied they were with their trip to Willmore. Eighty-five percent of respondents indicated they were either satisfied or very satisfied (Figure 39). In comparison, 13% of respondents were either very dissatisfied or dissatisfied. Thirteen percent may be a higher percentage than actual, as the researcher suspects that some respondents

confused the terms dissatisfied with satisfied or very dissatisfied with very satisfied. For example, one participant indicated they were very dissatisfied with their trip, however they had many satisfying highlights listed under the most satisfying highlights of their trip (Appendix J - Question 5) and also positive highlights listed under the most dissatisfying aspects of their trip (Appendix J - Question 6).



**Figure 39. Trip Satisfaction**

*n* = 87. Percentages are rounded off.

Participants' most satisfying and dissatisfying trip highlights included a wide variety of responses (Appendix J - Questions 5 and 6). All participants provided a response for satisfying trip highlights (*n* = 88) and many participants also provided responses for dissatisfying aspects of their trip (*n* = 84). However, out of those respondents, seven people indicated in writing that they did not have anything to list (e.g., none, can't think of anything etc.). Due to the number and variety of responses, NVIVO 10 was utilized to categorize the responses into overarching themes for both satisfying trip highlights and dissatisfying trip aspects. The top five most mentioned satisfying trip highlights were: (1) "beauty," (2) "solitude or remoteness," (3) "wilderness experience," (4) "wildlife," and (5) "non-motorized" (Table 24).



**Table 24. Most Satisfying Trip Highlights**

Major Theme	Description	Example Comment
Beauty	References pertaining to the beauty, scenery, or the views.	<ul style="list-style-type: none"> <li>• “Amazing scenery.”</li> <li>• “Natural beauty of the environment.”</li> <li>• “Beautiful scenery.”</li> </ul>
Solitude or Remoteness	Descriptions related to not seeing other people, secluded, remoteness, isolated, few people, solitude, not being crowded.	<ul style="list-style-type: none"> <li>• “Remoteness.”</li> <li>• “Not crowded.”</li> <li>• “No people.”</li> <li>• “The fact that we are so isolated from other people.”</li> <li>• “Camping with nobody else around.”</li> </ul>
Wilderness	Related to feelings, experience, character, or atmosphere of wilderness, or references to wilderness	<ul style="list-style-type: none"> <li>• “The wilderness experience.”</li> <li>• “Undisturbed wilderness.”</li> <li>• “The wilderness atmosphere: few trails, very few people; lots of wildlife signs (bear, moose, wolves, tracks).”</li> <li>• “Feels more like wilderness than the big National park.”</li> </ul>
Wildlife	References pertaining to wildlife	<ul style="list-style-type: none"> <li>• “The amount of wildlife we saw.”</li> <li>• “Viewing elk.”</li> <li>• “Lots of wildlife signs (bear, moose, wolves, tracks) and a grizzly bear grazing near a pass on the Great divide trail. A great moment!”</li> </ul>
Non-Motorized	References related to the non-motorized aspect of Willmore	<ul style="list-style-type: none"> <li>• “Not having to put up with the ripping/tearing obnoxious OHVs.”</li> <li>• “Away from motorized recreation.”</li> <li>• “No motorized traffic.”</li> <li>• “The peacefulness and lack of motorized vehicles.”</li> </ul>

The themes scenic quality and solitude were also found by Cole and Hall (2008); however, they found water features, weather, and activities to be the other commonly mentioned trip highlights. Other themes that emerged as being important trip highlights were: horses

(Willmore being a great place to be with their horses and great trails for horses), campsites and trails, the social aspect of the trip (meeting people, spending time with friends and family), quiet, exploration, hiking, ridges, the primitiveness, nature, history, and low restrictions and freedom.

For dissatisfying trip aspects, the top five emergent themes were: (1) “trails, signage, or markers,” (2) “weather and smoke,” (3) “litter,” (4) “camps,” and (5) “perceptions of damage by horses” (Table 25). This contrasted many of the trip low points found by Cole and Hall (2008) which were: bugs, crowds, dust, horses, trail conditions, fatigue, temperatures, and steep hiking. Horses and trail conditions were found to be a source of trip dissatisfaction in both Willmore and in the U.S. wilderness areas represented in Cole and Hall’s study. For Willmore, some of the reasons for trip dissatisfaction included factors that were out of human control; the weather and smoke from forest fires, however, other items were related to potential park stewardship concerns. Interestingly, trails were also listed as mentioned above as a trip highlight where people indicated they enjoyed the trail system, the maintenance, and selection of trails; however, the conditions of some trails, the presence or absence of signs, markers, and maps were points of dissatisfaction to some respondents. Whether signs are appropriate or not within a wilderness area such as Willmore warrants deep future consideration in order to maintain wilderness character such as primitiveness. Experienced users who are familiar with the park may find signs revolting while first-time visitors with minimal navigational experience may find them a welcome sight. For example, Seekamp and Cole (2009) found in their study of Green Lake, Oregon wilderness users both tolerance and opposition to wilderness infrastructure (e.g., signs, bridges, toilets etc.). The participants who opposed infrastructure felt structures identified civilization and reduced reliance on personal skills. Tolerance for infrastructure was expressed as being more appropriate for high visitor areas to help reduce ecological impacts and for increasing the naturalness of the area (Seekamp & Cole, 2009). Edgecombe (1982) reiterated the importance of considering the philosophical aspect along with appropriate sign design and placement in Willmore.

Also indicated by survey participants was the issue of litter as a source of their trip dissatisfaction. Improper garbage disposal had been identified in the early 1980s as being “the number one problem” (p. 10) and had accumulated in campsites (Edgecombe, 1982, p. 10). In his report, Edgecombe had recommended an ongoing cleanup program and the implementation of

messaging for “pack-in, pack out” at trailheads. Though according to some users, the litter problem has improved over time, it still appears to be an issue in some areas, so education and communications would be a recommended action.

**Table 25. Dissatisfying Trip Aspects**

Major Theme	Description	Example Comments
Trails, Signage, or Markers	References pertaining trails, trail conditions, trail damage, signs, and markers	<ul style="list-style-type: none"> <li>• “Poor signage on trails.”</li> <li>• “Some trails need some chainsaw work. Used to do this myself when I was younger and in the park more.”</li> <li>• “The main trail, starting from the trailhead near Rock Lake, is a very boring hike, much like being on a treadmill. It is wide, bare and uninteresting.”</li> <li>• “Would have been nice to see some trail signs for hikes up the ridges.”</li> <li>• “Signage for trails and maps along the way. Most of the time we had no idea where we where or how far the next trail was.”</li> </ul>
Weather and Smoke	References to weather or forest fire smoke	<ul style="list-style-type: none"> <li>• “Unfortunately our trip shortened due the rain”</li> <li>• “The weather but you live with it.”</li> <li>• “It rained + snowed almost every day that we were in. We were sheep hunting so the rain &amp; snow reduced the amount of hunting we could do.”</li> </ul>
Litter	References related to litter or garbage	<ul style="list-style-type: none"> <li>• “Garbage left in the backcountry by other people.”</li> <li>• “The amount of garbage that has been left in the wilderness. We packed out everything we took plus saddle bags of trash we picked up.”</li> <li>• “Some horse camps were dirty, for example blue Grouse: garbage, opened tins... Campfire remains had been disturbed by wildlife, probably because of unburned garbage - IT'S NOT BEAR SMART! It seems that some horseback parties and/or hunters aren't always respectful to bears. And garbage = addicted (grizzly) bear which is dangerous for hikers... For our security we decided to avoid this campsite.”</li> </ul>
Camps	References made about backcountry camps	<ul style="list-style-type: none"> <li>• “Running across a couple of poorly maintained outfitter camps near Seep Creek.”</li> <li>• “Random toilets will get to be a major concern as Park usage increases, Firewood will also be a problem as usage increases.”</li> <li>• “Very limited spots to camp with our horses.”</li> </ul>

Major Theme	Description	Example Comments
Perception of Horse Damage	Related to references to horses	<ul style="list-style-type: none"> <li>• “Rock Lake to Starlight has been over used by horse. Trail damage, over grazing.”</li> <li>• Outfitters leaving horse unaccompanied to graze for days. Hooves and water erode trail into deep grooves (2'-3' deep) I am not against horse in the park just over used in some spots”</li> <li>• “Horse manure everywhere.”</li> <li>• “Level of erosion due to the level of use by horse pack trains.”</li> </ul>

#### 4.1.4.3 Willmore Trip Motivations

In-depth survey respondents were asked to indicate the importance of 24 motivations on a scale of 1 (*not at all important*) to 5 (*extremely important*). Responses are summarized in Table 26. The top three motivations for Willmore were: (1) “enjoy the experience of wilderness,” (2) “view and enjoy the scenery,” and (3) “enjoy quietness and be away from crowds” (Table 26). The three least popular motivations indicated were: (1) “do something creative (e.g., painting, photography, etc.),” (2) “teach others,” and (3) “grow spiritually” (Table 26). Other motivations that rated highly included: “explore new areas,” “experience solitude,” “get exercise,” “be away from other people,” “freedom to make your own decisions,” “be challenged,” and to “relax and rest” (Table 26). Within the Willmore trip motivation question, respondents could specify up to three of their own motivations and also rate the item according to the same scale described above. In total, there were 27 motivations specified by respondents, however 11 items were omitted because they were repeats of motivations already listed, there were no scale ratings indicated, or the motivation listed was illegible. This resulted in 16 final motivations. These motivations are summarized in Table 27. The top two motivations were: “to hunt” (12.5%,  $n = 2$ ) and to “travel in a non-motorized area” (12.5%,  $n = 2$ ). All the motivations that were specified by users were either rated 4 (*important*) or 5 (*extremely important*).

**Table 26. Visitor Motivations for Visiting Willmore (Descending Order of Means)**

<b>Motivation</b>	<b><i>n</i></b>	<b>Mean</b>	<b>Standard Deviation</b>
Enjoy the experience of wilderness	87	4.77	0.45
View and enjoy the scenery	87	4.75	0.44
Enjoy quietness and be away from crowds	88	4.67	0.54
Explore new areas	88	4.59	0.62
Experience solitude	87	4.47	0.80
Get exercise	88	4.26	0.73
Be away from other people	88	4.18	0.89
Freedom to make your own decisions	87	4.16	1.04
Be challenged	88	4.05	0.73
Relax and rest	87	4.00	0.99
Be with friends	86	3.84	1.23
Study nature or environment	88	3.78	0.99
Learn about the park	88	3.69	0.95
Be with others with similar interests	88	3.66	1.14
Engage in traditional uses of Willmore	86	3.59	1.38
Do something with your family	87	3.49	1.37
Learn more about yourself	87	3.38	1.11
Reflect on past memories	88	3.30	1.29
Improve your skills and abilities	87	3.25	1.15
Take risks	88	2.92	1.17
Do someone that someone else (e.g., family member) wanted you to do	87	2.91	1.20
Grow spiritually	88	2.83	1.32
Teach others	87	2.83	1.29
Do something creative (painting, photography, etc.)	87	2.75	1.17

**Table 27. Motivations Specified by Survey Respondents**

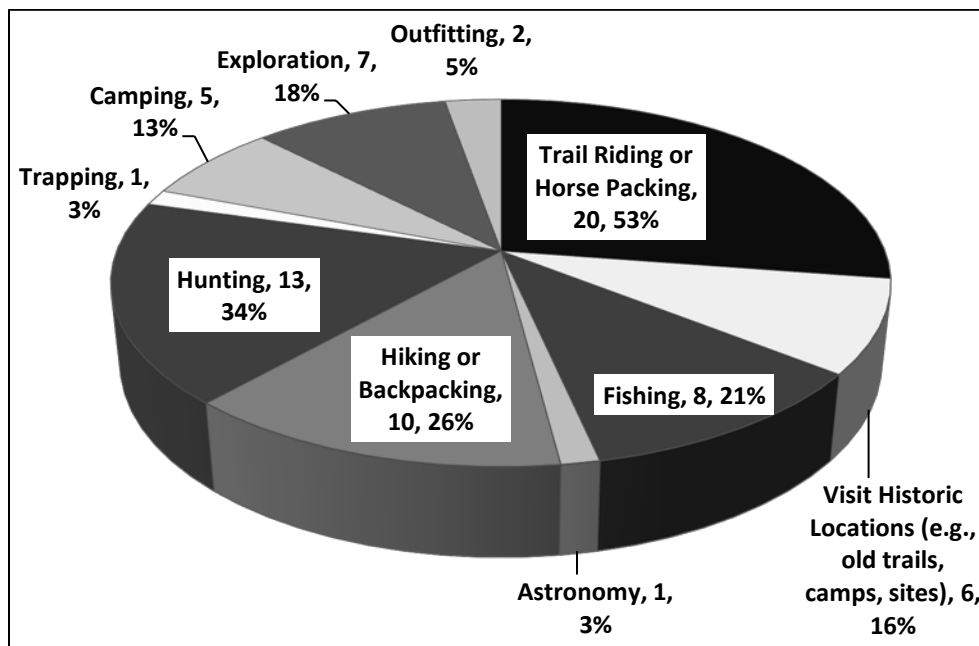
	1	2	3	4	5
Item	n(%)	n(%)	n(%)	n(%)	n(%)
To hunt	-	-	-	-	2 (12.5)
Use equipment	-	-	-	-	1 (6.3)
For satisfaction	-	-	-	-	1 (6.3)
Learn local history	-	-	-	-	1(6.3)
For wildlife	-	-	-	1 (6.3)	1(6.3)
To use horses	-	-	-	1 (6.3)	1(6.3)
To be self-reliant	-	-	-	-	1(6.3)
Travel in a non-motorized area	-	-	-	-	2(12.5)
Increase hunting success	-	-	-	-	1(6.3)
Enjoy food	-	-	-	-	1 (6.3)
No rules	-	-	-	-	1 (6.3)
Be away from restrictions (no registration)	-	-	-	-	1 (6.3)

Note: n = 16. 1 = Not at all important; 2 = Not important; 3 = neutral; 4 = Important; 5 = Extremely important.

The results of this study pertaining to motivations were consistent with preference domains from previous studies. As discussed in Chapter Two, the most popular recreation experience preference domains from wilderness studies conducted by both Cordell et al. (2005) and Hammit (2004) were: enjoy nature, physical fitness, reduce tensions, escape, and learning. Results obtained by Cole and Hall (2008) in their study of 19 U.S. wildernesses differed slightly with participants identifying closeness to nature, away from crowds, sense of being away from the modern world, sense of freedom, and wilderness opportunities as their top trip motivations. Alberta provincial park visitors identified the following as motivations for selecting a provincial park: appreciation of nature, to be with family and or friends, relaxation, wilderness/natural setting, and a safe/secure setting (the Praxis Group, 2008). For Willmore respondents, they appeared to be motivated to visit Willmore for a true wilderness experience along with enjoyable aesthetics such as pleasant scenery, quietness, and the opportunity to experience solitude and exploration. Similar to the findings of Cole and Hall, freedom was an important experiential aspect of their trip motivations.

For respondents that specified a rating of either 4 (*important*) or 5 (*extremely important*) for the motivation “engage in traditional uses of Willmore” they were asked to provide examples of traditional use. Forty-six respondents had indicated a rating of either a 4 or 5; however, eight

responses were missing a specified traditional use for a total of 38 responses for traditional use (some of which contained more than one example). Respondents' examples of traditional use are summarized in Figure 40. Activities centered around horses or mules (e.g., trail riding or horse packing) was the most popular response (53%), followed by hunting (34%), hiking or backpacking (26%), and fishing (21%) (Figure 40). It was common for respondents to list more than one traditional use, so it appears that many of these activities were related to one another. For example, one respondent listed "riding horseback trails used by natives and early outfitters" as a traditional use which was categorized under trail riding or horse packing and visiting historic locations. An important aspect categorized by respondents as traditional, was travelling in a non-mechanized manner as people did in the past through modes of travel such as horse and hiking. Related to horses and hiking were hunting, visiting historic locations, and general exploration.



**Figure 40. Traditional Use Examples from Survey Respondents**

$n = 38$ . Percentages exceed 100% because respondents provided more than one answer. Percentages are rounded off.

#### 4.1.4.4 Willmore Familiarity

In this section of the mail survey, respondents were gauged about their knowledge and familiarity of Willmore. It is important to bear in mind throughout this section that questionnaire respondents were Willmore park users with at least some park experience and not members of general public who have not visited the Park. One could speculate that users, who completed the

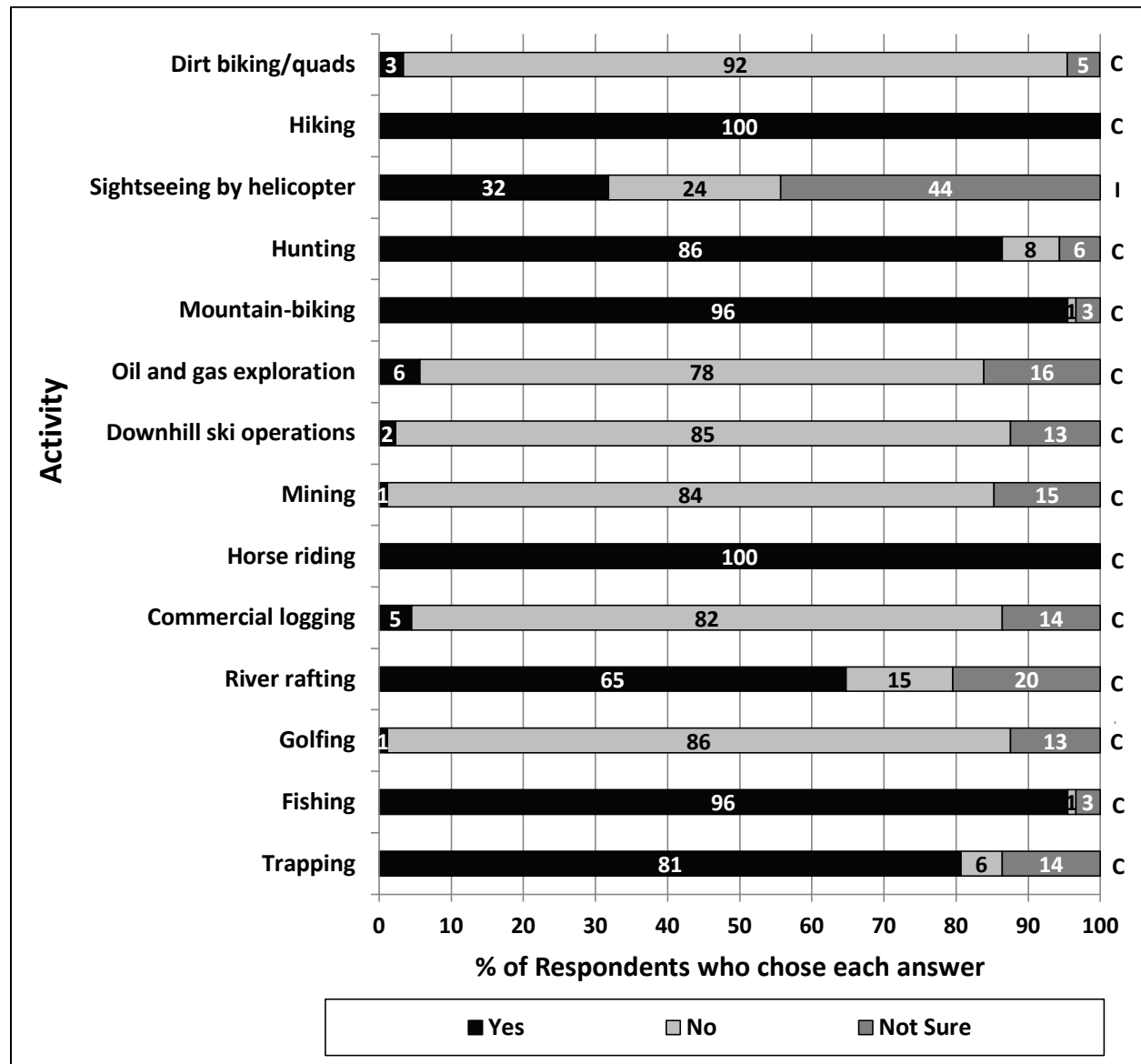


in-depth survey, should be more familiar with Willmore compared to someone from the general public who had not been into the park. This is similar to Booth et al. (2009) who indicated that their study provided conservative upper bounds on knowledge levels for protected areas and that the wider public was likely to have less knowledge than the surveyed visitors that were a selective subset. For Willmore, this study may have provided a conservative upper bound on knowledge levels pertaining to ecological, park management, and familiarity aspects of the Park.

#### **4.1.4.4.1 Willmore Activities**

Respondents were presented a list of activities and were asked if each activity was allowed in Willmore. A response of yes, no, or not sure was provided. This goal of this section was to gain an understanding of the knowledge level of respondents related to rules and regulations, more specifically, permitted activities within Willmore. As suggested by Hocket and Hall (2000) it was important to ask users specific questions on wilderness management policy to determine their true knowledge level. In their study, visitors were confused about differences between federal wilderness areas and national parks. It was important to learn respondent familiarity of management policies in Willmore as it differs not only from other designated wilderness parks in Alberta, but also from the rules and regulations of national parks (e.g., Jasper National Park). The level of respondent familiarity with allowable activities in Willmore is shown in Figure 41. Generally, respondents' knowledge about allowable activities in Willmore was good. This included horse riding and hiking, both of which respondents indicated with 100% certainty that these were allowable activities. Respondents were also fairly certain that both mountain-biking and fishing were allowable activities (96%), along with hunting (86%) and trapping (81%). This showed that respondents were aware that Willmore differed from other designated wilderness (e.g., the White Goat Wilderness Area) where horses, hunting, and fishing are not permitted activities. Respondent knowledge of hunting as an allowable activity showed that they understood the park rules that differ from Jasper National Park (where hunting and trapping are not allowable activities). Respondents were also aware that some activities such as dirt biking and quadding (92%), golfing (86%), downhill ski operations (85%), mining (84%), commercial logging (82%), and oil and gas exploration (78%) are not permitted in Willmore. Technically, one can bring a golf club and hit golf balls in the park, but commercial golf developments are not permitted. This item could have been worded more precisely within the survey. Respondents were less certain if sight-seeing by helicopter (44%) and river rafting (21%)

were allowable activities within the park. Sightseeing by helicopter is not permitted in Willmore; however, the uncertainty of this as a permitted activity could have been due to their use by Provincial Government and Federal staff (e.g., Alberta Parks and Jasper National Park) for research, cabin construction, fire patrols or suppression, search and rescue, and law enforcement.



**Figure 41. Activity Familiarity of Respondents**

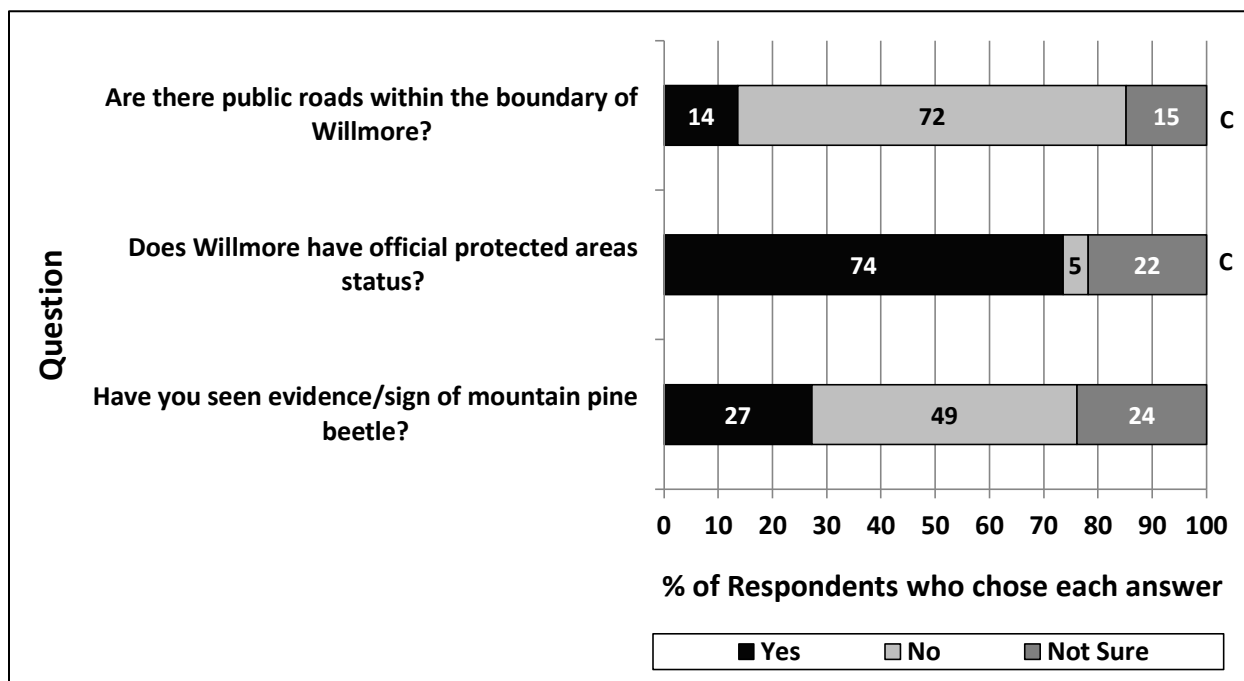
*Note.*  $n = 88$ , except oil & gas exploration where  $n = 87$ . C = correct answer; I = incorrect answer. Greater than 50% is considered a correct answer. Percentages are rounded.

This may have resulted in some visitors thinking that these are tours and not research or patrol activities. Technically, one can raft on Willmore rivers, but there are no existing commercial river rafting operations based inside Willmore. One rafting operation operates from Grande

Cache and operates some trips at the edge of Willmore among their trips on the Sulphur, Smoky, and Kakwa Rivers. Some visitors to Willmore may have been confused by observing OHVs in the park. They are only permitted for use by Parks' staff or licensed trappers during certain seasons; otherwise motorized use is prohibited within the park. This should be better communicated to visitors and rules enforced to ensure users are following these guidelines.

#### 4.1.4.4.2 General Willmore Familiarity

Figure 42 summarizes the results of general park familiarity questions.



**Figure 42. General Willmore Familiarity Questions**

*Note.*  $n = 88$  except for question 10 where  $n = 87$ . C = correct answer; I = incorrect answer. Greater than 50% is considered a correct answer. There was no correct answer for the third question above. Definitions were provided for public roads, but not protected areas status. Percentages are rounded.

#### 4.1.4.4.3 Knowledge of Public Roads

Approximately 72% of survey respondents indicated there were no public roads in Willmore; however, 29% either thought there were public roads or they were not sure (Figure 42). This may have been because some visitors were not familiar with the location of the Willmore boundary at the main staging areas. They may have considered the main access roads as being inside the park boundary. Other respondents may not have been familiar enough with Willmore to have determined this.

#### **4.1.4.4.4 Knowledge of Protection Status**

Interestingly, over 27% of respondents either thought Willmore did not have official protected areas status or were not sure (Figure 42). This was not surprising to the researcher, as some people may not have been familiar with the classification of parks within Alberta. In addition, activities such as hunting and trapping are permitted in Willmore, which some visitors may have found confusing. In general, these activities are not permitted in protected areas and may have potentially created confusion over the protection status of Willmore. Willmore is governed under its own Act, and deciphering the level of protection that Act offers through its legislation, may have been confusing. Park users not being highly aware of the protected area designation of a site was consistent with previous research. Booth et al. (2009) found that many users were not aware of SSSI designation when they were recreating within in the United Kingdom. Correct knowledge levels about the site designation varied for sites from approximately 8% to 43% (Booth et al., 2009). In Shenandoah National Park, Virginia only 25% of backcountry visitors appeared to be aware if they had visited a federal wilderness area before (Hockett & Hall, 2000). It was also found that hikers were not aware which management zones was wilderness. Cole and Hall (2008) also found that most visitors just knew a little about how wilderness was legally defined. This lack of awareness has management implications for Willmore. For example, if users think Rock Lake and Willmore are both classified as Willmore Wilderness Park, then they may react differently to proposed management actions such as regulations and camping restrictions. Hockett and Hall (2000) indicated it is critical to know the true knowledge of respondents, so additional knowledge questions are essential (e.g., questions pertaining to management policies of the area). As discussed in the previous section, respondents in this study were gauged about allowable activities and had a good level of knowledge. This suggests they were familiar with rules and regulations for Willmore as some activities that are permitted in Willmore vary from some adjacent protected areas (e.g., Jasper National Park and Kakwa Wildland Provincial Park).

#### **4.1.4.4.5 Familiarity with Mountain Pine Beetle**

This particular question did not have a correct answer but instead probed respondents to gauge if they were familiar with signs or evidence of MPB. To some respondents, MPB may have been a new hazard. According to McFarlane and Watson (2008) some people were not familiar with MPB since its impacts were localized and relatively unknown to people outside the

area of infestation. In their study, it appeared that local visitors (i.e., from Alberta or British Columbia) had some knowledge of MPB whereas visitors from other areas had substantially less knowledge. In Willmore, approximately 27% of respondents indicated they saw signs or evidence of MPB during their trip (Figure 42). Respondents that indicated they saw signs or evidence were requested to describe if the beetle impacted their trip in any manner. The responses ( $n = 24$ ) were grouped into three overarching themes: (1) “did not affect their trip,” (2) “their trip was affected,” or (3) “their future trip would be affected.” Most respondents felt that their trip enjoyment was not affected by MPB, though they had observed evidence or sign. For example, one respondent commented “it didn't impact our enjoyment and we didn't adjust our route to avoid it.” While another commented “the pine beetle has no impact on my enjoyment of the Willmore. The pine beetle likely was a natural cycle similar to other forest pests. Attempts to stop the pine beetle are rather arrogant and useless.” Another respondent perhaps noticed pine beetle on earlier trips but had become accustomed to it stating “getting used to seeing it, try to stay above the tree line anyhow.” Another individual saw the positive aspect of MPB and stated “did not impact trip at all. Dead trees = fire wood.”

For other respondents, observing evidence or sign of pine beetle affected their trip experience. Two respondents indicated that the crews working on MPB control had impacted their trip through altered aesthetics and from leaving behind physical objects. Their comments were the following: “I've encountered numerous control points for MPB and I was disturbed to find an abandoned gas can (plastic). Also I didn't see the need to leave a meter of tape around given today's GPS technology” and “on a trip into the Jackpine R. and Mt. Deheber area crews had done considerable cutting and burning of individual trees.” Other respondents found the general visual aesthetics of Willmore degraded by noticeable pine beetle sign and stated “not as visually pleasing with beetle damage,” “saw the damages from a distance away” and “there were lots of dying trees.” One respondent found the physical effects of pine beetle altered their trip experience specifically related to trails and commented “trees where flattened across trails and had to be cut to continue.” Interestingly enough, one respondent was not presently concerned about pine beetle but more concerned about future affects and commented “trails will be impacted in the future as the dead trees fall.”

The low proportion of respondents that indicated they saw signs or evidence of MPB could have been due to a few different reasons. First, respondents may not have travelled in areas

where MPB infestation or MPB management control (e.g., fall and burn, baiting or pheromone traps) was present or visible. There are certain areas of Willmore that have experienced extensive fall and burn control measures. Two wildfires in 2006 in the Fetherstonhaugh-Sheep Creek-Muddywater drainages and the Jackpine drainage removed a large proportion of MPB habitat and infested trees (Graham & Quintilio, 2006). Second, respondents may have seen signs or evidence of mountain pine beetle or beetle control but were not familiar with it or aware of what it was. This could especially be true for visitors from other areas as was described above. McFarlane, Stumph-Allen, and Watson (2004) generally found their study respondents (park visitors and residents) were not very knowledgeable about MPB. Knowledge levels about MPB for Willmore visitors was not investigated; however, this and management preferences for MPB may be valuable to learn in future studies should MPB become more prevalent in Willmore. D'Antonio et al. 2012 suggested visitors in their study were more aware of management issues that directly affected their park experience. MPB outbreaks in Rocky Mountain National Park have resulted in management intervention (e.g., campground closures) which may have altered visitor experience resulting in more aware visitors. Study participants self-rated themselves as being the most knowledgeable of MPB-related management issues while over half rated themselves with no knowledge of other management issues (e.g., elk management, fire management) (D'Antonio et al., 2012). Perhaps in Willmore, if MPB becomes more prevalent in higher use areas, visitors may also become more aware of MPB. In this study, it did not appear to have greatly impacted visitors' park experience. D'Antonio et al. (2012) discovered a relationship between prior experience and park ecological knowledge. Repeat visits may increase visitor learning (i.e., park ecology or stewardship practices) of a protected area. Their findings revealed that the more ecological knowledge that a visitor had may have influenced their awareness and perceptions of ecological resource impacts.

#### **4.1.4.4.6 Familiarity with Species at Risk**

This question investigated if respondents were aware of species at risk in Willmore. If they were, respondents were to list the species they considered at risk. Sixty percent of survey respondents were aware of species at risk (either flora or fauna) in Willmore ( $n = 86$ ). Though the majority of respondents were aware of species at risk, it was surprising that approximately 40% of respondents were not aware of species at risk within Willmore. This is concerning especially with high profile species of concern (e.g., grizzly bear and caribou) that inhabit

Willmore. In some cases, this may have been attributed to respondents being from outside of Alberta and not being familiar with Willmore. For respondents from Alberta, perhaps improved park outreach, communications, and information about Willmore ecology including wildlife should be enhanced. Forty-four responses were provided by participants who chose to list species and many people indicated more than one species. It should be noted that three respondents who indicated they were not aware of species at risk provided comments for this question. Two of these respondents noted they were not familiar with but were interested in becoming more knowledgeable about this topic and stated “this is due to my lack of education. I would be very interested in learning if there are plant and animal species at risk, what they are and why” and “need to be educated/informed what they are.” One respondent was apparently in denial that grizzly bears were classified as a species at risk and stated “I do not think the grizzly bear study is accurate or that they are at risk.” The most common species that were listed (in order of frequency) were: grizzly bear, caribou, wolverine, and bull trout. Animal species were more commonly listed than plants or trees; however, some respondents were familiar with listed species such as Whitebark Pine, and a moss called Porsild's Bryum. Please refer to Appendix M for a list and frequency of species mentioned by respondents. As discussed in the literature review, previous research has found varied results pertaining to visitor knowledge of wildlife or specific species for particular parks or protected areas. For example, visitors to Rocky Mountain National Park, Colorado were found to have the greatest ecological knowledge related to wildlife (D'Antonio et al., 2012). Randler et al. (2007) found through comparing people who had never visited an urban German park with park visitors, the park visitors scored better than non-visitors on their knowledge of faunal species of the site. In Willmore, study participants had experience with the Park, but were not extremely knowledgeable about species at risk inferring members of the general public would even be less knowledgeable about species at risk.

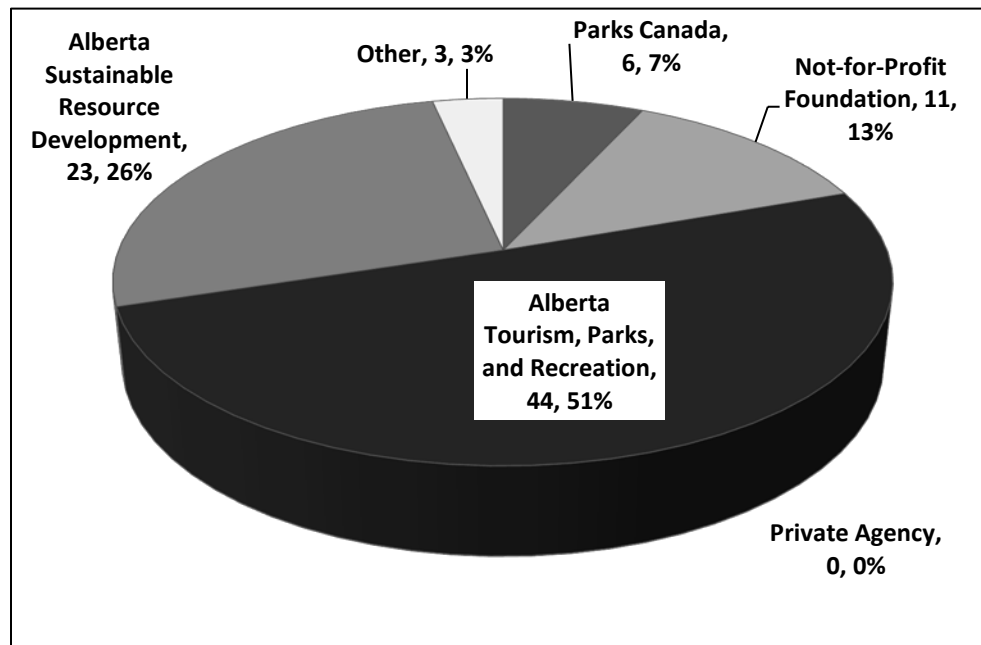
#### **4.1.4.4.7 Familiarity with Major Rivers**

Respondents were asked to list major rivers that flowed through Willmore. Respondents provided 80 responses many of which contained a list of rivers. Eight respondents indicated they either did not know or did not complete the question. Many respondents were familiar with the major rivers in Willmore. The top five most frequently listed major rivers in descending order of frequency were: Wildhay, Smoky, Berland, Sulphur, and the Jackpine. Major rivers in Willmore often present challenging river crossings to both horse and hikers especially during periods of

spring run-off and precipitation. It is important for users to be knowledgeable not only about the names of the rivers but the locations of crossings with relation to their trip route and the potential hazards associated with high water and river crossings. As described in the Introduction to this thesis, these rivers are important headwaters and with the exception of the Smoky, all of them originate in Willmore (Alberta Forest Service, 1988). D'Antonio et al. (2012) found Rocky Mountain National Park, Colorado visitors to be most knowledgeable about water and wildlife when gauged on their self-rated ecological knowledge.

#### 4.1.4.4.8 Familiarity with Willmore Management Agency

Just over 50% of survey respondents were familiar with the managing agency for Willmore (Figure 43) meaning nearly 50% of respondents did not know the correct management agency. Respondents that indicated other (3%) specified that they did not know who managed



**Figure 43. Park Management Agency**

*n* = 87. Percentages are rounded off.

Willmore and one respondent indicated Alberta Community Development which is an outdated government department which was no longer in existence (Figure 43). Thirteen percent indicated they thought a not-for-profit foundation managed the park. The Willmore Wilderness Foundation is a charitable, not-for-profit group that performs trail maintenance and promotes the history of the Park. They publish a newsletter, have their own website, and a dedicated office in Grande

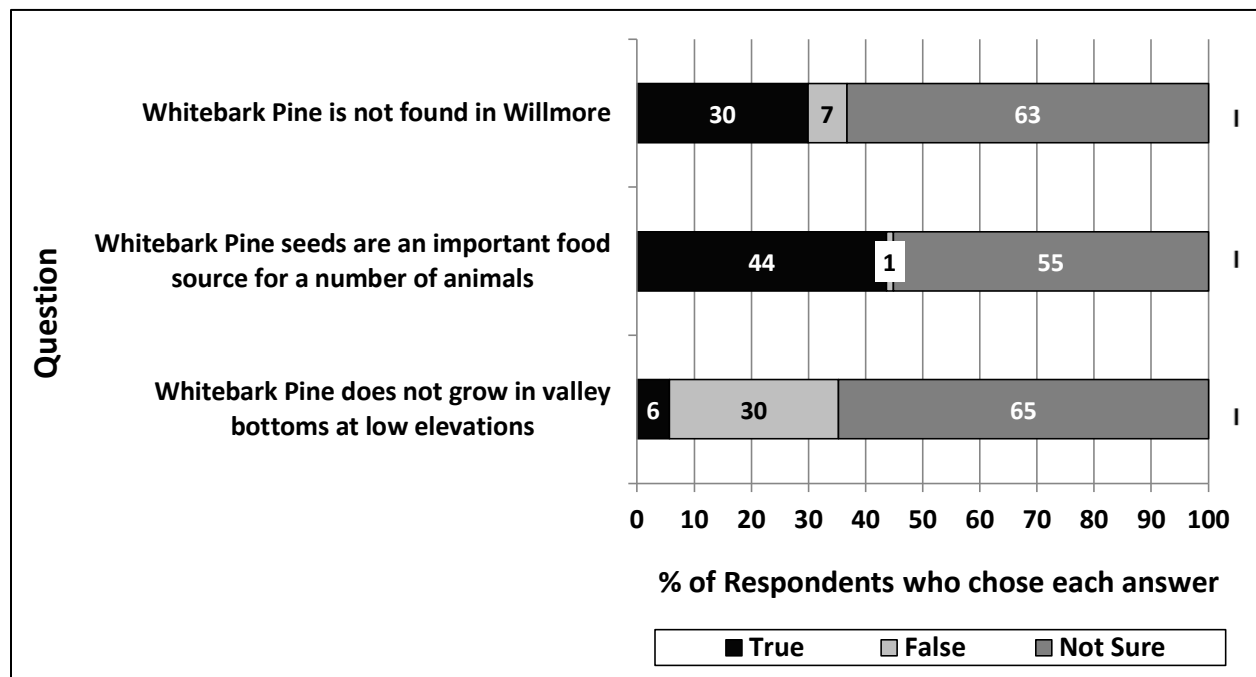


Cache. Some confusion may have existed that they are the land manager for the park. Low knowledge levels regarding the park authority was also found by Papageorgiou (2001) where only 50.5% and 43.6% of their two subsequent sample groups were aware the Forest Service managed national parks in Greece.

The lack of knowledge could have potential have negative effects. If visitors are not aware of the managing agency for Willmore, this may link to these visitors not being able to locate the correct information, rules and regulations for the park. The lack of awareness about the managing agency for Willmore may have been attributed to the park not having a management plan. Often for a management plan to be successfully implemented there needs to be engagement of park users and the greater general public. Without a management plan and the associated engagement process (which would be carried out through the managing agency - Alberta Tourism, Parks and Recreation), perhaps there were few opportunities for park visitors to be involved or to be exposed to the managing agency. It was also common for the Provincial Government to experience internal reorganizations, so names and departments have changed over time. Users may not have been aware of past internal reorganizations and some may have been confused. For example, in the late 1980s Willmore was administered by the Alberta Forestry, Lands and Wildlife, Forest Service. In addition, there are few recent publications about Willmore and those that do exist are often out of date, thus communicating inaccurate information about the current managing agency for the park. Staging areas appeared to have sparse park information available for visitors. Both Big Berland and Cowlick Creek staging areas did not have trailhead kiosks to convey park information in 2010 (Big Berland has an old kiosk located a few kilometers down the trail but when examined in 2010 the kiosk was in decrepit condition displaying only a historic map of the Park). Through this project, the Rock Lake and Sulphur Gates trailhead kiosks were updated with basic park information (e.g., park map, rules and regulations, and bear education posters). For users from other provinces or countries, being familiar who managed the park may have been a challenge.

#### 4.1.4.4.9 Familiarity with Whitebark Pine

In question 15 of the survey, visitors were posed three true or false questions related to Whitebark pine (*Pinus albicaulis*). Whitebark pine is a species of concern as its population is globally in decline as a result of an introduced fungus *Cronartium ribicola* (that manifests as blister rust), MPB, fire suppression and changing climate (Alberta Tourism, Parks and Recreation, 2013a). The species is an important food source for other species such as birds, squirrels, and bears and is considered a *keystone species* (Alberta Sustainable Resource Development and Alberta Conservation Association, 2007). A keystone species “is a plant or animal that plays a crucial role in ecosystem functioning” (National Geographic, 2013). The pine is limited to high elevation habitats where it can live many years sometimes reaching over 1000 years in age (Perkins & Swetman, 1996). It was important to learn how familiar park visitors were with whitebark pine because it may not be as well-known as other high-profile species of concern (i.e., grizzly bear and caribou) and park visitors may have a role to play in future conservation initiatives. If visitors are not aware of the species, then education can be geared towards educating Willmore visitors about this important keystone species. The results are summarized in Figure 44.



**Figure 44. Familiarity with Whitebark Pine**

Note.  $n = 87$  except for question 15 (c) where  $n = 88$ . C = correct answer; I = incorrect answer. Greater than 50% is considered a correct answer. Percentages are rounded.

It was evident from this series of questions that many respondents were not familiar with whitebark pine, its ecology, and that it was found in Willmore. Only 7% of respondents correctly indicated that whitebark pine was found in Willmore. A large percentage of respondents were not sure (63%). Forty-four percent of respondents were correct in agreeing that whitebark pine seeds are an important food source for a number of animals. Just over half of the respondents were not sure (55%). Only 6% of respondents were correct in indicating that whitebark pine does not grow in valley bottoms at low elevations in Willmore (Figure 44). Most respondents indicated they were not sure (65%). Overall, the majority of respondents indicated they were not sure for all three whitebark pine questions. This suggests that familiarity with the species was low. As mentioned previously, these results indicate the importance of improved outreach and education for species such as whitebark pine in Willmore.

#### **4.1.4.4.10 Familiarity with Neighbouring Protected Areas or Parks**

In question 16 of the survey, respondents were asked to list adjacent protected areas or parks to Willmore. It was expected that responses to this question would depend on how the respondent defined adjacent. To analyze and determine correct responses from this question because respondents could self-define adjacent, parks or protected areas that were located at least partially within 25 km of the Willmore boundary were accepted as correct answers (the park or protected area did not have to share the boundary with Willmore to be adjacent). A 25 km buffer was created around Willmore in Arcmap 10 software and Alberta and British Columbia Parks that were at least partially contained within the 25 km clip layer were considered to be correct answers (adjacent parks). The resultant list of Alberta and British Columbia Parks that were contained in the 25 km buffer surrounding Willmore are summarized in Table 28.

**Table 28. Alberta and British Columbia Parks Located Within 25 km of the Willmore Park Boundary as Determined Through GIS Buffering**

<b>Park or Protected Area Name</b>	<b>Province</b>
Holiday Creek Arch Protected Area	British Columbia
Kakwa Provincial Park and Protected Area	British Columbia
Mt. Robson Provincial Park	British Columbia
Small River Caves Provincial Park	British Columbia
Sunbeam Creek Ecological Reserve	British Columbia
Big Berland Provincial Recreation Area	Alberta
Jasper National Park	Alberta
Kakwa Wildland Provincial Park	Alberta
Pierre Grey's Lakes Provincial Park	Alberta
Pinto Creek Canyon Natural Area	Alberta
Rock Lake-Solomon Creek Wildland	Alberta
Rock Lake Provincial Park	Alberta
Sheep Creek Provincial Recreation Area	Alberta
Smoky River South Provincial Recreation Area	Alberta
Sulphur Gates Provincial Recreation Area	Alberta
Wildhay Provincial Recreation Area	Alberta
William A. Switzer Provincial Park	Alberta

*Note.* Alberta Provincial Recreation Areas do not typically offer a level of protection as their main focus is for recreation; however, they were included because they were designated under the Provincial Parks Act.

There were 79 responses specified by respondents, most of which included more than one park or protected area. The top five most common responses were: Jasper National Park ( $n = 72$ ), Kakwa Wildland ( $n = 20$ ), Kakwa ( $n = 15$ ), Rock Lake Solomon Creek Wildland ( $n = 14$ ), and Rock Lake Provincial Park ( $n = 11$ ). Often, respondents did not specify a full name for the park they listed so it was unclear if for example the answer Kakwa was referring to Kakwa Provincial Park in British Columbia or Kakwa Wildland Provincial Park in Alberta (or both). This was often the case for Rock Lake, where there seemed to be confusion with respondents naming Rock Lake Provincial Park or Rock Lake-Solomon Creek Wildland Park. Sometimes incorrect names were listed such as Rock Lake Recreation Area or Rock Creek Provincial Park. Other incorrect park names included: Sulphur Lake, Solomon Wildland Park, Greg Lake, Buck Lake Provincial Park, and the area around Tumbler Ridge. Kakwa Provincial Park and Mt. Robson Provincial Park were the only British Columbia parks that were listed. This was most likely due to most respondents being from Alberta or outside the province and not being familiar with British Columbia parks. Various Alberta provincial recreation areas were specified by

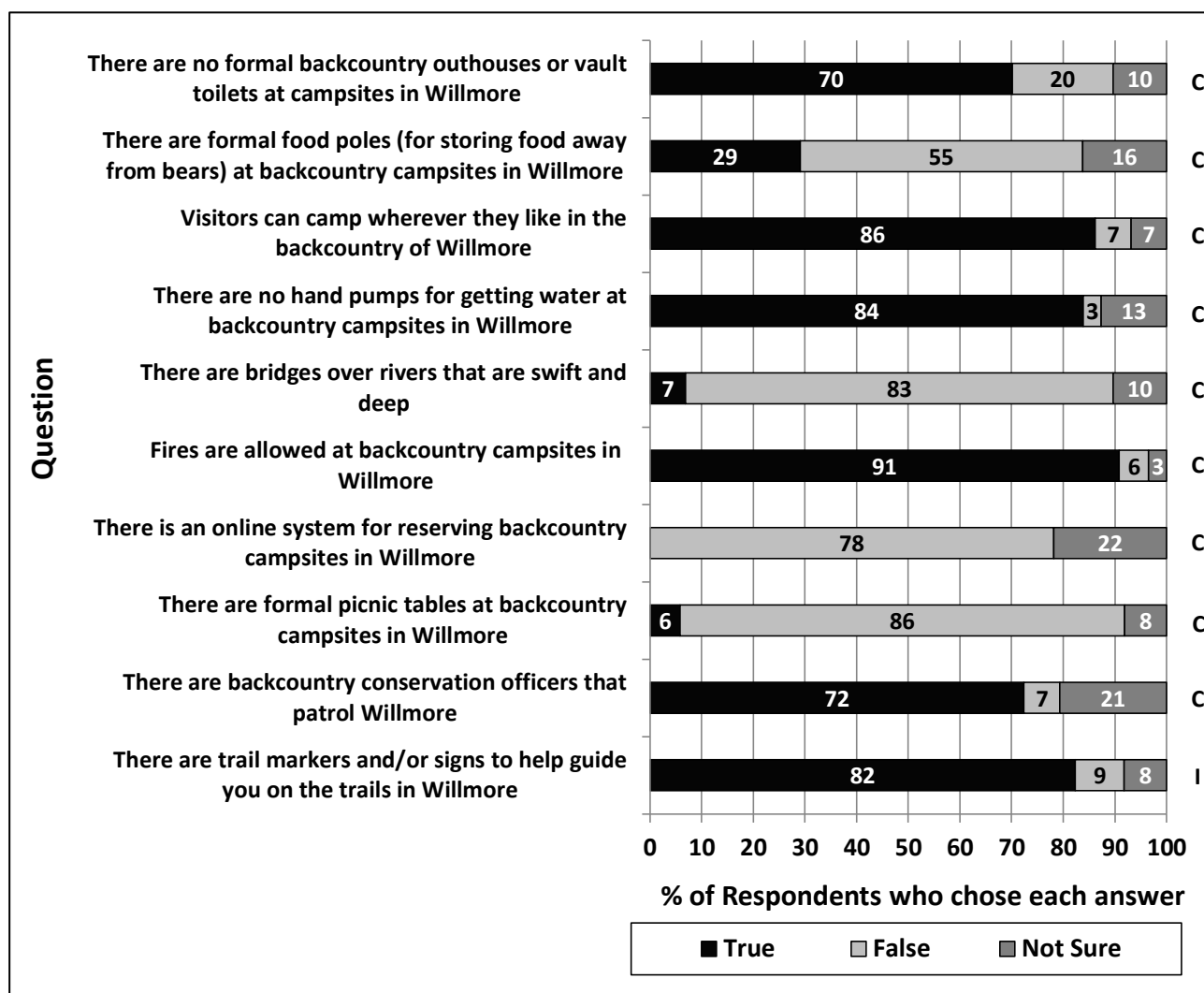
respondents; however, in a true protected area definition where the main goal of the protected area status is to protect and preserve the area, provincial recreation areas have a main goal of recreation. Technically recreation areas are not true protected areas or parks. There was no mention by respondents of the Kakwa-Willmore Interprovincial Park which consists of Willmore Wilderness Park, Kakwa Wildland Park, and Kakwa Provincial Park (including Kakwa Protected Area) in British Columbia. This could be due to sparse visitor communications and information surrounding this memorandum of understanding between Alberta and British Columbia. Participant knowledge of adjacent protected areas to Willmore may be important in their overall knowledge level. For example, Papageorgiou (2001) found that park visitors' past experience in other parks in Greece was related to their enhanced overall knowledge level. Contact and immersion within natural areas such as protected and wilderness areas may "be an efficient mechanism and a significant impetus for generating substantial learner interest in critical park issues compared to simply communicating factual information." (Papageorgiou, 2001, p. 71). For example, an outdoor interpretive program in Jasper National Park that focusses on caribou may go beyond the Jasper boundary and resonate with users as they visit and experience a park such as Willmore.

General visitor knowledge pertaining to Willmore and its ecosystem is important. Pavlikakis and Tshihrintzis (2006) felt that well-informed users not only aided in the development of a management plan, but would also participate in monitoring and adaptation to management plans. According to Lafon (2002) past studies have revealed that active participation in natural resource management can improve participant knowledge. This suggests that opportunities to engage Willmore visitors would be beneficial to both park managers and to park visitors alike.

#### **4.1.4.4.11 Trip Familiarity**

Participants were presented a set of ten true or false statements referring to things they may have noticed during their trip(s) to Willmore. In general, respondents were familiar with Willmore, answering nine out of the ten questions correctly (Figure 45). Willmore differs greatly from the developed backcountry visitor areas of Banff and Jasper, so it was important to learn if visitors were knowledgeable about these differences. For example, high use backcountry areas in Jasper National Park have designated campsites which require a permit (that has an associated

fee). Backcountry campgrounds may have picnic tables, vault toilets, structures or poles for food storage from bears, and trails may have bridges or structures over larger and deeper water crossings. There is generally trail maintenance in higher use areas and signage for most camps and trails. Due to recent budget reductions in Parks Canada, trail maintenance in some parks have been drastically reduced or terminated and backcountry bridges or water crossing structures may no longer be maintained in low use regions (e.g., North Boundary Trail, Jasper National Park). Willmore is a much different experience with limited trail maintenance (mainly done by users), generally few signs and trail markers, non-designated campsites, and no formally implemented campsite structures (e.g., vault toilets). If there are structures such as toilets or bear food poles at campsites it is most likely these were constructed by park users (i.e., outfitters). One may find rustic pit toilets, food hangs etc., but these were not formally implemented by the managing agency.



**Figure 45. Trip Familiarity**

*Note.*  $n = 87$  except for questions 17(b)  $n = 86$ , 17(h)  $n = 86$ , 17(j)  $n = 85$ . C = correct answer; I = incorrect answer. Greater than 50% is considered a correct answer. Percentages are rounded.

There appeared to be some confusion with trail markers in Willmore, as 82% of respondents indicated they thought there were trail markers or signs to help guide visitors on the trails. There are some older markers and signs present (e.g., Eagles Nest area); however, unlike many national parks areas, many trails in Willmore are not officially marked and signed. The confusion may be due to many respondents visiting the areas of Willmore where signage exists and not areas of the park where signage does not exist. The responses may also be an artifact of how the question was posed. It would have been clearer to have worded the statement as: all trails in Willmore are marked and signed. As will be discussed under place meanings, signs and markers may impact wilderness qualities.

#### 4.1.4.5 Your Relationship with Willmore

This section of the survey explored respondents' place attachment to Willmore. Respondents rated each of the 17 place attachment statements from *strongly disagree* to *strongly agree*. Responses are summarized in Table 29. Respondents expressed a moderately high level of place attachment through their ratings on a five-point scale ( $M = 3.91$ ,  $SD = 0.9$ ).

**Table 29. Place Attachment Statements for Willmore (Descending Order of Means)**

<b>Item</b>	<b><i>n</i></b>	<b>Mean</b>	<b>Standard Deviation</b>
<b>I would be sad if I could not enjoy the physical attributes of Willmore</b>	86	4.64	.631
<b>I am fond of Willmore</b>	86	4.57	.712
<b>I have pleasant memories of spending time with friends and family in Willmore</b>	86	4.51	.778
<b>I have strong positive feelings for Willmore</b>	86	4.49	.628
<b>I will (do) bring my family and friends to Willmore</b>	86	4.36	.734
<b>My attachment to Willmore is mainly due to its landscape and wildlife</b>	87	4.22	.676
<b>Visiting Willmore says allot about who I am</b>	86	4.08	.857
<b>I have a special connection to Willmore and the people I spend time with there</b>	86	3.90	1.006
<b>Willmore is the best place for what I like to do</b>	85	3.89	1.000
<b>I identify strongly with Willmore</b>	86	3.74	.972
<b>When I visit Willmore others see me the way I want them to see me</b>	85	3.69	.859
<b>I feel like Willmore is part of me</b>	86	3.65	.967



<b>Item</b>	<b><i>n</i></b>	<b>Mean</b>	<b>Standard Deviation</b>
<b>I get more satisfaction out of Willmore than any other park</b>	88	3.47	1.114
<b>I feel happiest when I am visiting Willmore</b>	86	3.45	1.102
<b>The cultural and traditional heritage of Willmore is very special to me</b>	86	3.40	1.055
<b>My friends and family would be disappointed if I stopped visiting Willmore</b>	85	3.34	1.080
<b>I would not substitute any other area for doing the types of things I do at Willmore</b>	86	3.08	1.140
<b>Totals</b>		3.91	0.901

#### **4.1.4.6 Your Views on Potential Willmore Challenges**

Respondents were asked their views on possible issues, challenges, or events (i.e., threats or risks) facing Willmore. They were asked to indicate how much risk 14 items impacted the health or environment of Willmore; choices ranged from *poses no risk* to *poses high risk* (and could also list *no opinion*). Results are summarized in Table 30. According to respondents, the top three items that posed a high risk to Willmore were the following: “industrial land activity next to Willmore” (59%), “mountain pine beetle outbreaks” (53%) and “declining populations of species at risk live in and around Willmore” (51%). Watson and McFarlane (2004) found their study participants (for the Clearwater Forest Area, Alberta) rated industrial activities as posing the greatest environmental threat for both of their samples ( $M > 4.0$  for both public and campers, on a scale of 1 = *not at all threatening* to 5 = *very threatening*). The public sample ranked oil and gas exploration and development (32%) and OHV use (24%) as the greatest threats to environmental quality (Watson & McFarlane, 2004). Though their sample consisted of crown

land campers using the area and the public living in and around the area, and their items to measure threat were different, their results provided interesting insight. Participants from both Willmore and the Clearwater Forest Area found industrial-related activities to be the greatest threat. This slightly contrasted McFarlane et al.'s (2004) findings where their study participants indicated their two highest perceived risks to the health and productivity of Banff and Kootenay park ecosystems were: lack of resources such as expertise and funding ( $M = 5.3$  to  $5.5$ ) and introduction of non-native plant and animal species ( $M = 5.0$  to  $5.3$ ). Mountain pine beetle outbreaks, land use development next to national parks, industrial activity (such as logging and mining) next to the parks, poaching of wildlife, and pollutants found in park rivers, lakes, and streams also rated highly ( $M > 4.0$ ) but with more variable group ratings (McFarlane et al., 2004).

For Willmore, the top moderate risks indicated by participants were: “climate change or global warming” (50%), “lack of park resources such as staff and funding” (50%), “promoting higher visitation levels in Willmore” (46%), and “the poaching of wildlife” (41%). Respondents thought that “prescribed burns in Willmore” (59%) presented little risk, closely followed by “the current number of people using Willmore” (58%), and “grazing by horses in Willmore” (48%). McFarlane et al. (2004) found their participants rated “naturally occurring forest fires in the parks” as having a low risk rating. Willmore respondents rated “wildfire in Willmore” as moderate risk rating (33%). A moderate risk ranking of wildfire in Willmore was consistent with past research that has shown a trend toward more positive and supportive visitor attitudes towards wildfire in wilderness in the western U.S. (Knotek, 2006).

In general, 44% of Willmore respondents thought “using science to guide management decisions” posed no risk. This supported McFarlane et al.'s (2004) findings where “putting a lot of trust in science to solve management issues” was the lowest rated threat. It was interesting to note, that close to 40% of participants were not familiar with species at risk in Willmore, however they were concerned with declining populations of species at risk in and around Willmore.

**Table 30. Views of Potential Issues, Challenges, or Events Facing Willmore (*n* = 85)**

<b>Item</b>	<b>Poses no Risk <i>n</i>(%)</b>	<b>Poses Little Risk <i>n</i>(%)</b>	<b>Poses Moderate Risk <i>n</i>(%)</b>	<b>Poses High Risk <i>n</i>(%)</b>	<b>No Opinion <i>n</i>(%)</b>
<b>Declining populations of species at risk that live in and around Willmore</b>	0 (0)	8 (9.4)	32 (37.6)	<b>43 (50.6)</b>	2 (2.4)
<b>Climate change or global warming</b>	5 (5.9)	9 (10.6)	<b>42 (49.4)</b>	22 (25.9)	7 (8.2)
<b>Wildfire in Willmore</b>	8 (9.4)	24 (28.2)	<b>28 (32.9)</b>	24 (28.2)	1 (1.2)
<b>Mountain pine beetle outbreaks</b>	4 (4.7)	4 (4.7)	30 (35.3)	<b>45 (52.9)</b>	2 (2.4)
<b>Poaching of wildlife</b>	0 (0)	10 (11.9)	34 (40.5)	<b>40 (47.6)</b>	0 (0)
<b>Grazing by horses in Willmore</b>	9 (10.6)	<b>41 (48.2)</b>	25 (29.4)	8 (9.4)	2 (2.4)
<b>Introduction of non-native plant and animal species</b>	0 (0)	10 (11.9)	32 (38.1)	<b>40 (47.6)</b>	2 (2.4)
<b>Industrial land activity next to Willmore (e.g., oil &amp; gas, logging and mining)</b>	2 (2.4)	9 (10.6)	24 (28.2)	<b>50 (58.8)</b>	0 (0)
<b>The current number of people using Willmore</b>	10 (11.8)	<b>49 (57.6)</b>	22 (25.9)	2 (2.4)	2 (2.4)
<b>Prescribed burns in Willmore</b>	18 (21.2)	<b>50 (58.8)</b>	12 (14.1)	4 (4.7)	1 (1.2)
<b>Promoting higher visitation levels in Willmore</b>	4 (4.7)	20 (23.5)	<b>39 (45.9)</b>	21 (24.7)	1 (1.2)
<b>Using science to guide management decisions</b>	<b>37 (43.5)</b>	23 (27.1)	18 (21.2)	3 (3.5)	4 (4.7)
<b>Lack of park resources such as staff and funding</b>	2 (2.4)	17 (20.0)	<b>42 (49.4)</b>	22 (25.9)	2 (2.4)
<b>Tourism development near Willmore such as resorts, casinos, etc.</b>	4 (4.7)	14 (16.5)	31 (36.5)	<b>36 (42.4)</b>	0 (0)

*Note.* The largest group of respondents was bolded for each item.

#### 4.1.4.7 Your Willmore Management Preferences

For this section of the survey, the goal was to learn the management preferences of respondents. Respondents were presented 16 management actions and were asked to specify how they felt from *strongly disagree* to *strongly agree* with also the option of *no opinion*. Results are summarized in Table 31. Management actions where respondents indicated they strongly disagreed or they disagreed (i.e., selected by more than 60% of respondents) were the following: “introduce a maximum length of stay per visit for park users” (73%), “introduce backcountry permit with a user fee in Willmore” (71%), “building designated campsites” (66%), and “making areas of the park easier to access by adding bridged river crossings” (62%). Management actions where respondents indicated *strong agreement* or *agreement* (i.e., greater than 60% combined) were the following: “educating Willmore users about minimum impact use” (93%), “clearing and maintaining Willmore trails” (89%), “allowing wood fires at campsites within Willmore” (87%), “backcountry patrols by conservation officers to enforce regulations and maintain cabins and campsites” (82%), “improving maps and information about Willmore for visitors” (80%), “adding/improving trail signs and markers on Willmore trails” (76%), “implement prescribed burns in Willmore” (74%), “closing areas of Willmore to help protect animals etc. that may not have healthy populations” (69%), “improving re-routing trails in Willmore” (67%), “not having a maximum group size for groups who use Willmore” (64%), and “providing bear food poles/lockers at Willmore campsites” (62%).

It was not surprising that “educating Willmore users about minimum impact use” rated so highly with respondents, as discussed earlier in the in-depth survey results, litter was identified as a source of trip dissatisfaction by respondents as well it was an emergent theme general comments provided in the trail survey.

For Willmore, it was clear that survey respondents valued freedom and flexibility surrounding their trip including camp location, trip length, and the lack of permits or wilderness passes and associated user fees. This contrasted findings reported by Bultena et al. (1981) where backpackers in Mount McKinley National Park, Alaska showed strong support for rationing uncontrolled use. A majority of backpackers were however, opposed to charging an entrance or user fee. Schneider et al. (2000) found over half the wilderness visitors in the southwestern U.S. they surveyed were supportive of a fee program and would return to the area even with fees.

Cole and Hall (2008) explored participant acceptance of nine management actions and similarly found that actions pertaining to low or no restrictions fostered the most support. Regulations for dogs and limitations on the number of day users were the most opposed. Cole and Williams (2012) made several generalizations pertaining to visitor management preferences while bearing in mind that they vary between people and location: (1) “there is much more support for actions that are not restrictive (such as education) or that only restrict certain groups (such as limits on large groups or on stock) than there is for restrictions that affect everyone (such as use limits)” (p. 15), (2) “restrictions are supported more in concept than in reality” (p. 15), (3) “most visitors are highly supportive of the current management regime, regardless of what it is” (p. 15).

It is important for Willmore park managers to understand the management preferences of visitors as it bridges management decisions and policies along with visitor experience which results in effective parks management. Gaining an understanding of visitor opinion is critical before embarking on a park management plan as it helps safeguard the support and acceptance for a plan (Pavlikakis & Tsihrintzis, 2006).

**Table 31. Management Preferences of Respondents**

<b>Item</b>	<b>SD n(%)</b>	<b>D n(%)</b>	<b>A n(%)</b>	<b>SA n(%)</b>	<b>NO n(%)</b>	<b>n</b>
Clearing and maintaining Willmore trails	5 (6.0)	4 (4.8)	<b>39 (46.4)</b>	36 (42.9)	0 (0)	84
Introduce backcountry permit with a user fee in Willmore	28 (32.9)	<b>32 (37.6)</b>	16 (18.8)	4 (4.7)	5 (5.9)	85
Implement prescribed burns in Willmore	1 (1.2)	14 (16.5)	<b>45 (52.9)</b>	18 (21.2)	7 (8.2)	85
Closing trails/areas of Willmore in order to help protect animals, plants, or trees that may not have healthy populations	5 (5.9)	20 (23.5)	<b>34 (40.0)</b>	25 (29.4)	1 (1.2)	85
Making areas of the park easier to access by adding bridged river crossings	<b>30 (35.3)</b>	23 (27.1)	15 (17.6)	14 (16.5)	3 (3.5)	85
Not having a maximum group size for groups who use Willmore	18 (21.4)	23 (27.4)	<b>27 (32.1)</b>	<b>27 (32.1)</b>	6 (7.1)	84
Introduce a maximum length of stay per visit for park users	24 (28.2)	<b>38 (44.7)</b>	16 (18.8)	3 (3.5)	4 (4.7)	85
Backcountry patrols by conservation officers to enforce regulations and maintain cabins and campsites	4 (4.7)	10 (11.8)	43 (50.6)	<b>50 (31.8)</b>	1 (1.2)	85
Adding/improving trail signs and markers on Willmore trails	7 (8.2)	11 (12.9)	<b>37 (43.5)</b>	20 (32.9)	6 (2.4)	85
Improving re-routing trails in Willmore	6 (7.1)	16 (18.8)	<b>37 (43.5)</b>	20 (23.5)	6 (7.1)	85
Improving maps and information about Willmore for visitors	1 (1.2)	11 (12.9)	<b>38 (44.7)</b>	30 (35.3)	5 (5.9)	85
Providing bear food poles/lockers at Willmore campsites	9 (10.6)	17 (20.0)	<b>35 (41.2)</b>	18 (21.2)	6 (7.1)	85
Educating Willmore users about minimum impact use	0 (0)	3 (3.5)	36 (42.4)	<b>43 (50.6)</b>	3 (3.5)	85
Building designated campsites	24 (28.2)	<b>32 (37.6)</b>	21 (24.7)	5 (5.9)	3 (3.5)	85
Providing pit toilets/outhouses at backcountry campsites	15 (17.6)	23 (27.1)	<b>34 (40.0)</b>	10 (11.8)	3 (3.5)	85
Allowing wood fires at campsites within Willmore	2 (2.4)	4 (4.7)	33 (38.8)	<b>41 (48.2)</b>	5 (5.9)	85

*Note.* SD = Strongly Disagree; D = Disagree; A= Agree; SA = Strongly Agree; NO = No Opinion.

#### **4.1.4.8 Demographics**

It is important for park managers, staff, and park operators to be aware of the demographics of their clients – the park visitors themselves. This knowledge is also important in the planning and development of communications, outreach, marketing, and interpretative materials and programs. This final section of the mail survey collected information pertaining to the demographics of the survey respondents.

##### **4.1.4.8.1 Gender and Age**

Sixty-two percent of survey respondents were male and 38% were female ( $n = 86$ ). This was similar to the results obtained from the trail cameras and trail surveys where the majority of park users were male. As discussed in the trail camera results, a majority of wilderness visitation is by males but in some areas the numbers of women are increasing (Dawson & Hendee, 2009). The mean age of respondents was 45.8 years of age ( $SD = 14.2$ ) and ranged from 14 to 76 years of age. Cole and Hall (2008) found the average age of their wilderness participants was 48 years, which was very near the average age of Willmore respondents.

##### **4.1.4.8.2 Ethnicity/Cultural Background**

Respondents could specify up to two ethnic and cultural groups that they felt they could identify with. Eighty-six respondents indicated one group and another seven identified a second group resulting in a total of 93 responses. These groups were totaled together and the results are summarized in Table 32. A majority of respondents (86%) self-identified themselves as Canadian. Dawson and Hendee (2009) noted that wilderness participation of racial and ethnic minorities were largely underrepresented, however this underrepresentation appeared to be decreasing.

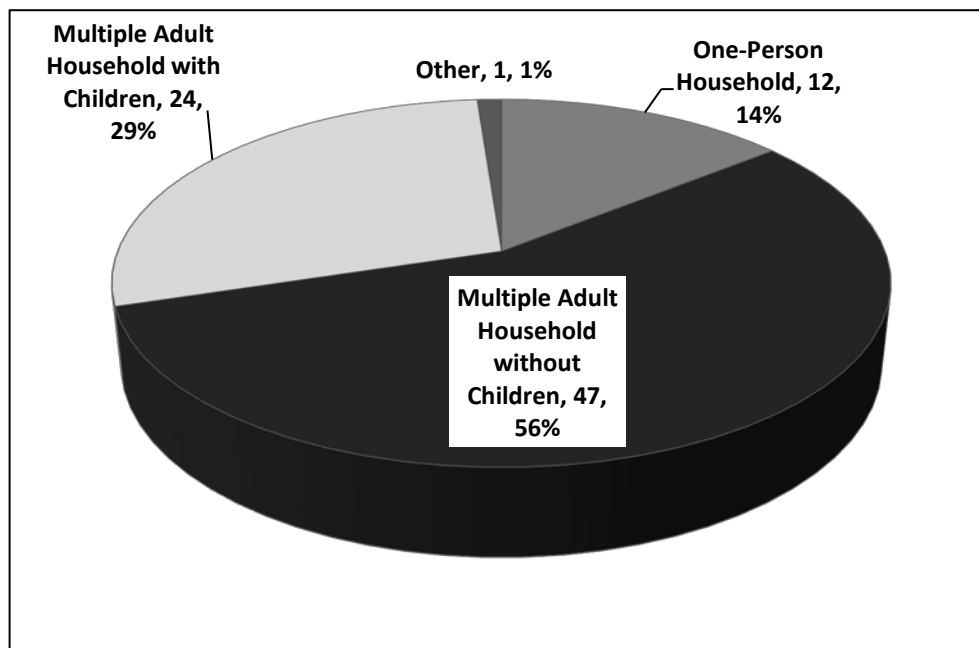
**Table 32. Ethic or Cultural Self-Identification**

<b>Group</b>	<b>Number</b>	<b>Percent</b>
Canadian	80	86
Polish	3	3
British	2	2
German	1	1
Metis	1	1
New Zealand	1	1
French	1	1
Italian	1	1
Northern European	1	1
Scottish	1	1
Irish	1	1
	93	100%

*Note.*  $n = 88$ . Respondents could indicate up to two ethnicities, so the total is greater than 88.

#### **4.1.4.8.3 Household Structure**

Demographics related to house-hold structure revealed that 56% of respondents described their household structure as a multiple adult household without children (Figure 46). One respondent indicated *other* as their choice and specified their household as one adult with children.



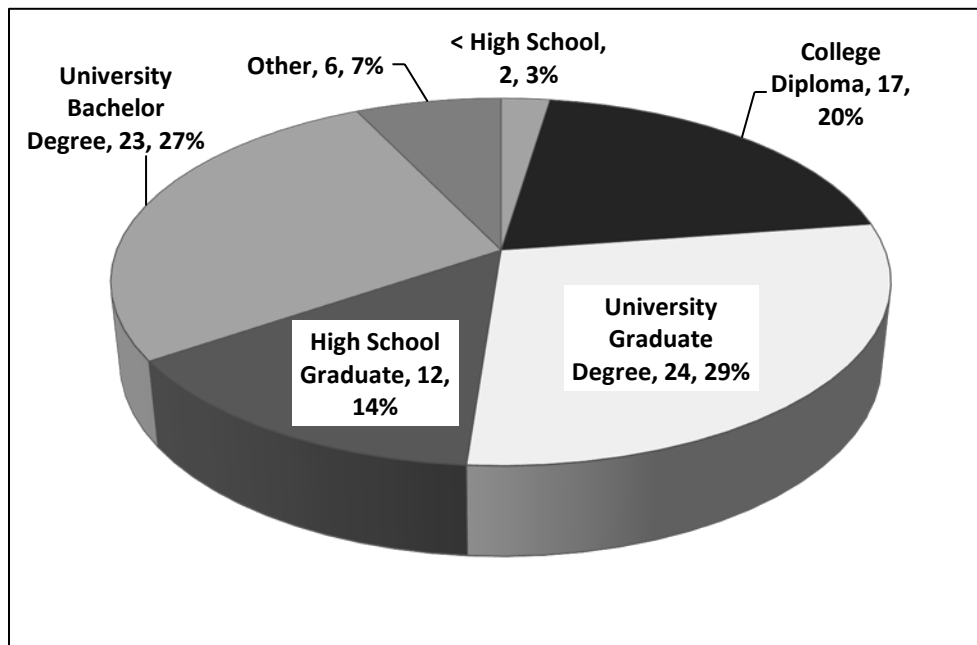
**Figure 46. Household Structure**

*Note.*  $n = 84$



#### 4.1.4.8.4 Education Levels

The educational level of survey respondents was high with 20% of participants having at least a college diploma, 27% having a bachelor's degree, and 29% having a university graduate degree (Figure 47). Only 2% of respondents had completed less than high school. A total of six respondents indicated *other* as their selection and listed technical school ( $n = 5$ ) and some college ( $n = 1$ ). This coincided with Dawson and Hendee (2009) where they found that a discerning attribute of wilderness users were high education levels. High education levels have been shown to be the attribute that most distinguishes wilderness visitors from the general population (Dawson & Hendee, 2009; Lucas, 1989). Education level can be associated with above-average income and professional and technically oriented occupations which are discussed next.



**Figure 47. Highest Level of Completed Education**

Note.  $n = 84$ .

#### 4.1.4.8.5 Primary Occupation

There were a variety of primary occupations specified by respondents ( $n = 83$ ). Occupations that were listed by respondents were categorized and coded into 20 major themes within SPSS. The summarized results are shown in Table 33. The most common categories of occupations were: “education” (14%), “semi-retired or retired” (11%), “medical” (10%) and

“natural resources or environment” (10%) (Table 33). Education included occupations such as professor, teacher, and instructor.

**Table 33. Categorized Occupations of Respondents**

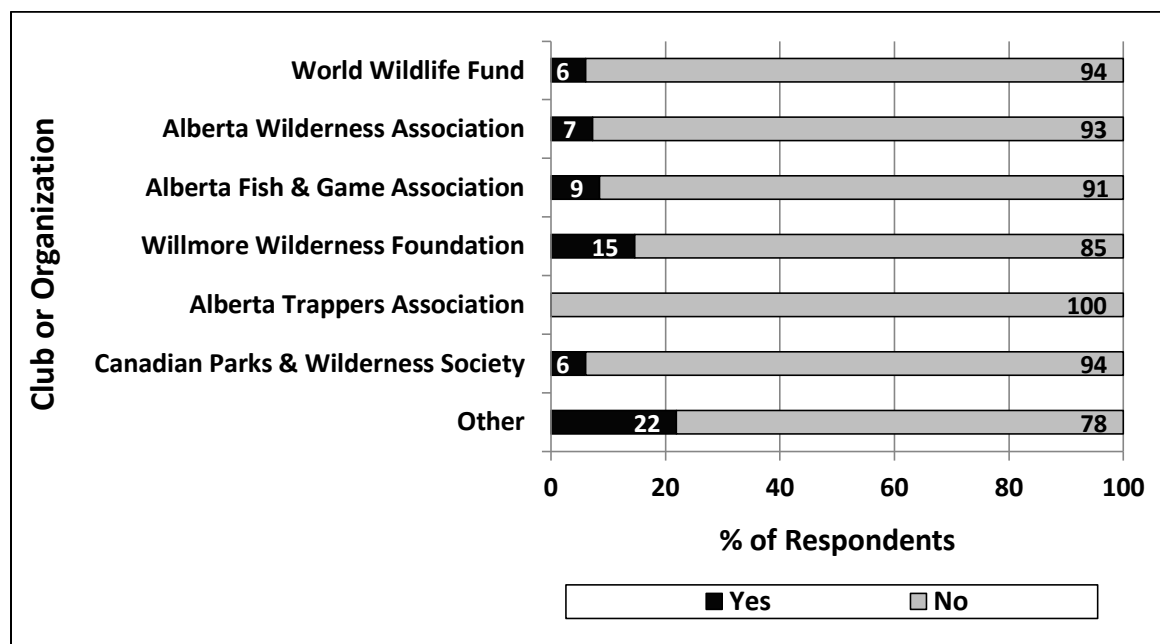
<b>Occupation</b>	<b>Number</b>	<b>Percent</b>
Construction	4	5
Education	12	14
Enforcement	1	1
Engineer	7	8
Farming or ranching	2	2
Financial	2	2
Government	2	2
Homemaker	3	4
Management	4	5
Medical or health	8	10
Natural resources or environment	8	10
Oil and gas	2	2
Other	5	6
Sales	1	1
Semi-retired or retired	9	11
Service industry	2	2
Sports	1	1
Student	3	4
Tourism	1	1
Trades	6	7
	83	100%

Medical and health included occupations such as physician, veterinarian, nurse, and mental health therapist. Natural resources or environment included occupations such as professional forester, biologist, resource consultant, etc. The other category included occupations that did not fit under the main categories. Many of the major themes were categorized as professional and technical which in many wilderness areas comprise the majority of wilderness users (Dawson & Hendee, 2009). Students were not found to be as prevalent as indicated by Dawson and Hendee. Retirement is related to increased use of parks because there are more opportunities and time for participating in leisure activities (The Praxis Group, 2008).

#### **4.1.4.8.6 Affiliations with Clubs or Organizations**

In this question, respondents were asked to indicate if they were a member of a list of clubs that were provided. Respondents could indicate membership to more than one selection

and could list other clubs they belonged to. Twenty-two percent of respondents indicated they belonged to organizations other than the ones provided in the survey and the next most popular selection was the Willmore Wilderness Foundation (15%) (Figure 48). No respondents indicated they were members of the Alberta Trappers Association.



**Figure 48. Memberships to Clubs or Organizations**

A list of organizations and clubs that respondents listed including frequency are summarized in Appendix N. Some respondents indicated more than one club, association, etc. that they belonged to. Within U.S. wilderness areas, approximately 20% to 30% of wilderness visitors were members of a conservation organization or outdoor-focused club (Lucas, 1989). Approximately one-tenth belonged to wilderness-related organizations such as the Sierra Club (Lucas, 1989). Dvorak et al. (2012) found an increase in Boundary Waters Canoe Area Wilderness participants who belonged to a conservation organization from 12% in 1969 to 35% in 1991. This decreased to 29% in 2007.

#### **4.1.4.8.7 Total Family Income**

Lastly, respondents were asked to indicate their total family income per year before taxes. The total family income indicated by respondents is summarized in Table 34. Eighty-three percent of respondents indicated their total family income was at least \$40,000 to \$59,999 per year before taxes. The largest group of respondents reported income between \$80,000 to \$99,999 per year before taxes. Twelve percent preferred not to answer this question. Income and

education have been correlated in previous research with those who use Alberta Provincial Parks (The Praxis Group, 2008). Visitors with higher levels of education and income tend to visit provincial parks. In many areas in the U.S. wilderness visitors were found to have moderately above average incomes (Lucas, 1989) but there was representation from all income levels (Dawson & Hendee, 2009).

**Table 34. Total Family Income**

<b>Group</b>	<b>Number</b>	<b>Percent</b>
Less than \$20,000	2	2
\$20,000 to \$39,999	2	2
\$40,000 to \$59,999	10	12
\$60,000 to \$79,999	10	12
\$80,000 to \$99,999	14	17
\$100,000 to \$119,999	12	14
\$120,000 to \$139,999	10	12
> \$140,000	13	16
I prefer not to answer this	10	12
	83	100%

## 4.2 Qualitative Results

The following section summarizes the findings from the semi-structured interviews that were performed either in-person, over the phone or in one case through written questions that were mailed to the participant. This study had a qualitative component in addition to the quantitative component of the study to provide additional richness and insight into the understanding of the relationship between park visitors and Willmore. The semi-structured interviews provided an opportunity for the researcher and participants to explore their relationship in an open and flexible manner where themes were allowed to emerge once analysis was undertaken. Initially, interviews were coded in NVivo 9 software, and initially 24 major themes (called *nodes* in NVivo software terminology) resulted. These themes were further combined and reduced to eleven final themes that described Willmore place meanings. It should be noted that some sub-themes were duplicated between major themes and some of the themes collected were not intended for this project (e.g., place names). As described in the methods section, thematic analysis was used to further refine, combine, merge, and delete themes. Though this process, themes were actively explored while relating back to the original research questions. Research questions were linked to the semi-structured interview guide (Appendix K).

### 4.2.1 Interview Participant Summary

In total, 16 interviews with 17 participants were conducted between June 14, 2011 and September 30, 2011. One of these interviews was a double interview in which two friends were interviewed at once. The double interview often produced separate answers from each participant; therefore, the information obtained from this interview was treated as two participants. Table 35 summarizes the characteristics of the interview participants. Occupations were omitted and pseudonyms were used to help maintain participant confidentiality. The approximate age range of the participants was from 39 to 71 years of age with a mean age of 55.5 years. All of the participants resided in Alberta with the exception of three participants (two

**Table 35. Interview Participant Summary**

Participant	Gender	Age	Province	Local/Non-Local	Commercial/Personal	Main Activity
Ana	Female	57	Alberta	Local	Both	Hiking
Anthony	Male	59	Alberta	Local	Personal	Horse
Charlie	Male	53	Alberta	Local	Commercial	Horse
Christopher	Male	71	Alberta	Non-local	Personal	Horse-assisted hiking
Cory	Male	63	Alberta	Non-local	Personal	Horse
Craig	Male	56	Alberta	Local	Both	Horse
Frank	Male	57	British Columbia	Local	Personal	Horse
Kimberly	Female	56	Alberta	Local	Personal	Cross-country skiing
Leroy	Male	56	Alberta	Non-local	Personal	Horse
Luke	Male	55	Alberta	Non-local	Personal	Backpacking/hiking
Margaret	Female	43	Out of country	Non-local	Personal	Backpacking/hiking
Maria	Female	62	Ontario	Non-local	Personal	Horse-assisted hiking
Mona	Female	55	Alberta	Non-local	Personal	Horse
Patricia	Female	57	British Columbia	Non-local	Both	Horse
Ricky	Male	39	Alberta	Local	Both	Horse
Sandra	Female	52	Alberta	Non-local	Personal	Horse
Scott	Male	53	Alberta	Local	Both	Backpacking/hiking

*Note.* Mean Age = 55.5 years old. Locals were defined as residing full-time within 50 km of the park boundary and non-local permanently resided in a location that was greater than this distance. It should be noted that some participants may have resided in different locations while using or working in Willmore so the non-local/local status was based on their place of residence at the time of the interview.

from out of province and one from out-of the country). Ten of the participants were male and seven of the participants were female. There were a wide range of occupations and there was a combination of participants who used Willmore commercially, non-commercially (for personal use) or both. The most frequent primary activity of participants ( $n = 10$ ) was horse-related (this

included trail riding, horse packing, or horse and wagon). Two of the participants' main activity was horse-assisted hiking, but it should be noted their main activity was hiking. Horse-assisted hiking involves backcountry gear being carried to location(s) by horses (while the person hikes instead of riding). With the inclusion of the two participants, there were a total of six participants whose main activity was hiking or backpacking. There was one participant whose main activity was cross-country skiing. One participant used the park as a result of conservation or enforcement related work as well as for personal use. Secondary or sub-activities included the following: hiking, mountain-biking, photography, hunting, sight-seeing, scrambling, nature observation, fishing, teaching or learning, and snow-shoeing. Interview participants included a balanced representation of local and non-locals. Eleven of the participants were non-commercial users and six of the participants were commercial operators (i.e., horse outfitting etc.). Some of the participants used the park both for personal and commercial use. Another participant used the park related to commercial visits and not for personal use. Some participants had identified strong family ties to the park through traditional or historic past family use of the park (e.g., aboriginal traditional use, early outfitting, etc.). Many of the participants were long-term or mid-range users. They had at least visited the park on more than one occasion for multi-day trips. As mentioned above, the mean age of participants was 55.5 years old. It is important to bear in mind that place meanings of younger age categories were not necessarily captured.

#### **4.2.2 Willmore Relationship Themes**

Table 36 summarizes the main emergent themes that encapsulated participants' relationship to Willmore. Please refer to the semi-structured interview guide (Appendix K) for a list of questions used to guide the interview questions. As found in other studies (e.g., Bricker & Kerstetter, 2002; Davenport et al., 2010), the relationship between study participants and Willmore was complex. There was a diverse array of emergent themes based on descriptions and stories related to memories, perceptions, values, attitudes or beliefs, emotions, experiences, and events. Through analytical exploration, common and divergent themes emerged across the diversity of respondents. This section focusses on describing the common resultant themes; however, it is important to note there were also many divergences among participants as well. Excerpts described by participants in their own words are provided as examples of each theme to better illustrate the rich depth of Willmore place meanings. Descriptions of these themes are fairly brief, since an in-depth analysis is beyond the scope of this thesis chapter. It is important to

point out that the best possible effort was made to divide themes into separate entities; however, many of the themes did not exist in an individualistic sense. Rather they were found to be complexly intertwined and related to one another.

**Table 36. Description of Emergent Themes**

<b>Emergent Theme</b>	<b>Theme Description</b>
Aesthetic Appreciation	References to aesthetic beauty of the landscape (e.g., vegetation, wildlife, water features, geology or topography, weather, etc.).
Social Bonding	Incorporated memories, experiences or events with family, friends, clients, or others.
Activity	Reference to Willmore as a backdrop for activities, recreation, or work.
Unique Physical Landscape	Reference to the unique scale, physical geography, topography, and geology.
Spiritual	Reference to spiritual experiences, moments, events, or feelings.
Traditional, Cultural and Historic	Encompasses traditional, cultural, or historic connections. Includes historic family or ancestral ties. Also includes exploration.
Freedom	References to non-restrictiveness or being unconfined.
Solitude	Descriptions associated with encountering or observing few or no people outside of their own group.
Escape and Restoration	References related to getting away from the pressures of life. Also includes references to healing or replenishment.
Undeveloped and Intactness	References associated with undeveloped, wild, pristine, untouched, etc.
Park Management	Associated with thoughts, feelings, beliefs, perceptions, and attitudes related to the management of Willmore.
a) Balance	Sub-theme of park management. References to balance such as visitation, research activities, promotion of Willmore, and stakeholder inclusion and participation.
b) Planning and Management	Sub-theme of park management. References pertaining to park challenges related to parks planning and stewardship.
c) Preservation and Protection	Sub-theme of park management. Relates to descriptions of desired park preservation and protection.

#### 4.2.2.1 Aesthetic Appreciation

This overarching theme as summarized in Table 36, encapsulated participant references pertaining to aesthetic beauty of the landscape (e.g., vegetation, wildlife, water features, geology or topography, weather, etc.). Descriptions of the visual beauty of Willmore included descriptions pertaining to *spectacular beauty*, *natural beauty*, *beautiful*, and *scenic*. Beauty pertaining to landscape features was also commonly described such as *large*, *open* and *scenic* valleys and *beautiful ridgelines*. A variety of scales described beauty ranging from the larger landscape scale to finer and more specific features. For example, the beauty of Willmore wildflowers was expressed by one female respondent:

**(Patricia)** “The wildflowers there again like lupines and columbine and larkspur and this little dandelion flower I think is orange and it grows about a foot high, at least there it did and I think it’s called Argosium or something like that and I’d never seen so much of it before and then fireweed and paintbrushes all and that was another thing just all the different shades of paintbrushes like it was the first time that I had ever sort of equated a painter’s pallet with the paintbrushes because there were all these shades of orange and pink and fuchsia and coral and the day we happened to be travelling and we were in the Sheep Creek, upper Sheep Creek area and it was just really kind of a dismal day, like it was overcast and the wind was blowing up but all the paintbrushes were like florescent.”

In contrast, another respondent described how Willmore was more beautiful than the Skyline Trail in Jasper because of the scale:

**(Christopher)** “It’s just tremendous being in that kind of country. Once you put in the first day to get in you don’t have to do what you do on the Skyline Trail for example. To be up in that kind of country, I think the views are better than on the Skyline Trail. The Skyline Trail I always felt like I was looking down on this immense valley on either side you know. It’s pretty - but I think Willmore is prettier because of the scale of it.”

For many of the participants, there appeared to be a special connection and appreciation to the beauty of ridges and mountains:

**(Christopher)** “The beauty of walking along those ridges is just indescribable you know.”

**(Maria)** “The thing that I like best is being on top of a ridge, whether it’s you know a low one or a high one.”

**(Ana)** “The vistas are unique. You don’t find them anyplace else.”



Similar to Schroeder (2002), some respondents described beauty going beyond visual aesthetics of a scenic landscape to include a more intense emotional response. Respect for the sheer natural forces of nature – including weather, was expressed by one participant when describing his special places in Willmore:

**(Frank)** “In bad weather these places can be hell but in nice weather it’s heaven.”

He further summed up his aesthetic appreciation which encompassed awe and the sublime, in his following description of areas he felt were beautiful:

**(Frank)** “Overwhelmed by nature and God especially at the tops of mountains, and the beauty, flowers, meadows and the smells.”

Roggenbuck and Driver (2000) described aesthetic benefits as encompassing awe and the sublime and being difficult to detangle from spiritual aspects. In this study, these two emergent themes appeared to strongly relate to one another. It was apparent that the wildlife that inhabits Willmore was special to many respondents. In many examples, participants described memories which encompassed wildlife observations and encounters. These experiences held meaning for participants through enjoyment of the visual beauty of the encounter, the special thrill and privileged feeling of the moment, and through experiencing these wildlife encounters with others (e.g., friends or family). Some locations also became *special* as a result of the wildlife experiences or wildlife being present in that particular location. For example, some respondents had favorite places that encompassed nice scenery and wildlife (e.g., *quite a bit of sheep* or lots of wildlife like moose, caribou, and grizzly bears). In some cases, respondents appeared to have formed a relationship of respect and admiration for wildlife:

**(Patricia)** “That’s where we saw the one grizzly, the mother and her cub and at first the horses, they kept looking over at that side of the valley and that’s why I was watching too just to see what it was. I thought it might be a caribou because quite often you see them there and then laugh, we could see the cub jumping to keep up with its mom so I went oh, oh, it’s a grizzly so we won’t go where she’s going, we’ll go this other way and then we kind of circled around but then we ended up going past these little lakes that were at the BC, well it was actually crown land in Kakwa Park. So right at the divide there and you end up going into these big meadows and they’re a couple of miles long and again we circled around. You could see lots of digging and we came down on this little lake and there was a big boar, black grizzly, that came out from the other shore and these lakes had big grassy banks so it’s not like the trees were up close and it was evening sun and he comes down and he has a drink of water and he sees us. We were across the lake, we were just standing looking at him and he wasn’t perturbed at all and he just kind of sat

down and was looking up at us, laugh, and I went okay, I think we'll leave now. We don't want to interrupt his revelry, whatever, so that was kind of neat."

Patricia later described the feeling of *privileged* when having these unique wildlife observations or experiences, and emphasized the respect she felt for wildlife:

**(Patricia)** "You have your camp with you, you're with the animals that live there and you sometimes have close encounters with them, laugh, but usually they're respectful of your space and if you're respectful of theirs there's no trouble, no conflict."

Others also expressed the importance of wildlife:

**(Luke)** "Whenever I see certain types of animals, those are always very memorable for me, so once up Seep Creek I was out walking and came across a lynx and it was just sitting there just watching me and that was really special you know and another time actually on one of the bike trips, we were up, what creek was that, the creek I was at, I think it was the Rock Creek Valley, it was a trappers cabin up there you know and we were biking towards Glacier Pass didn't get that far because right beside the path were a pair of grizzlies and so we just stopped and watched them for awhile and decided we didn't want to disturb them and so we turned around and yeah, and came back and then another occasion, I was in there with my daughter and we were camped in the Eagle's Pass area and we had a fire and it was night and a pack of wolves started calling to one another - yeah that was very special."

**(Leroy)** "A friend of mine and we, well we grew up together and I talked him into coming and he couldn't, he couldn't pass up the chance and then when we'd been in there two or three times we seen a bunch of like ewes, and stuff, we never saw no rams, and we looked and there was this big bunch of rams and it was pretty exciting. That was in just the beginning of hunting season. A couple of days before the season opened we used to just kind of go in and set up camp, and relax and then we would crash around for a few sheep here and there. On the way in we happened to spot this just bunch of rams on the mountain side yeah, I think there was 14 in the bunch and I think there was probably six or seven of them were full curls. I mean that was exciting you know. But after a while then after about three or four times I hadn't seen no rams and then when we finally got a chance this was pretty exciting to see this. Especially a bunch that size you know."

Aesthetic appreciation was commonly expressed by all user types including both commercial and personal users. Participants that had completed the in-depth mail survey component of this project identified *viewing and enjoying the scenery* as their second most popular motivation for visiting Willmore ( $n = 87$ ,  $M = 4.75$ ). Clearly, aesthetic enjoyment was an important component of Willmore meanings. The emergent theme of aesthetics related to the physical setting, paralleled the finding of many other studies of place meanings (Gunderson & Watson, 2007; McInnes, 2010; Schroeder, 1996; Schroeder, 2002; Smaldone, Harris, & Sanyal, 2008; Wynveen et al., 2012).

#### 4.2.2.2 Social Bonding

The theme of social bonding was emergent nearly across all participants. This theme incorporated memories, experiences or events with family, friends, clients, or others. As revealed by the trail cameras and trail surveys in this study, few people travelled solo, and a majority of visitors to Willmore travelled in groups. Roggenbuck and Driver (2000) felt people visited wilderness areas for social benefits. Essentially, when visitors are in wilderness, they become enveloped in the dynamics of their small and intimate group. Often, being in wilderness can provide the opportunity to strengthen and improve relationships as group members can become dependent on each other and barriers to communication may dissolve and trust may be gained (Roggenbuck & Driver, 2000). It was common for participants to describe memories and special moments that were experienced in the presence of family. For some participants (e.g., Ricky), these memories stemmed to back to childhood memories in the park that were experienced with his father. What was most likely a challenging situation at the time (nearly freezing to death while out riding with his father), had become a fond memory over time:

**(Ricky)** “There’s a lot of stories over the years up there. One thing I always remember is I went up there when I was 14 with my father, I damn near froze to death, I was so young and cold and riding and I always remember that because there was one dead spruce tree in the middle of a meadow and my dad just lit it up and you know what a warm insulator a big tree roaring in the middle of the bush, laugh, you never forget that eh, I couldn’t believe he lit the whole tree on fire but he said ah it’s a dead tree and you know how that overhang is. Lit it up and it was so cold and I always remember that because I remember he made me take my socks off and my coat and he dried them all out there and it turned in to be a mud puddle around where we were sitting and the tree was roaring and I always remember that, hard to forget eh?”

Manzo (2005) identified, that for some individuals, particular places initiate the memory of people and events. In some cases, these places act as what Manzo referred to as *bridges to the past*: emotional and psychological linkages which can help develop and maintain continuity in the lives of individuals (Manzo, 2005). For example, being in various locations within Willmore may trigger memories that are significant to the individual. Individual places may also become significant, due to the emergence of memories or events. Other respondents had scary memories that they recollected; however, over time they became *good* memories. Sometimes what seems to be the worst experience at the time, becomes memorable over time. The memory can be as much about the people, along with the event itself.

**(Sandra)** “We’ve gone through an underground bee’s nest. We’ve met up with mule pack trains that take a liking to Mona and I and want to follow us with but through no fault of theirs but have caused havoc with our routine because our horses weren’t used to the mules. We’ve had some tours up the side of the mountain that we didn’t plan. We’ve seen bears on the trail and moose, and we’ve gone along ridges that you know I wish I could have closed my eyes because it’s like way too steep but you know it’s part of the parcel right.”

Another respondent commented that it was the people she was with that made her Willmore trips memorable:

**(Mona)** “You know of course I’ve got things in my mind here that are making me giggle but I think all in all every time we go in there we’re going for a holiday to relax and spend some time with our horses and generally the people we’re with, I think it’s the people that we’re with, doing activities that we all like to do just make it more memorable because thinking about all these things that are making me giggle and it’s really the people I’ve been with.”

For many non-commercial and commercial participants, the experience of being with others and meeting others in the backcountry was highly enjoyable:

**(Leroy)** “The part I like is getting in where the people you meet in there are horse people then you know you already have something in common and visit, and it is just nice to be able to get back to a place like that where there are horses you know and the odd hiker goes by and they are more than willing to stop and always share a coffee and a visit and tell you what they’ve seen on the trail and stuff.”

**(Charlie)** “I hunted commercially in there for 18 years so I had a lot of good experiences with clients there and also in the commercial trail riding business, you know some of our clients came back here, 15 to 18 times, and they were more friends than they were clients and yeah I spent a lot of time in there with people that I enjoyed being with and going places that I knew they wanted to see because they were kind of interested in the same thing that I was.”

**(Kimberly)** “We were just randomly hiking and we meet this guy who’s randomly camped at some random campsite and he’s all, he’s got himself all groomed. Like he’s cleaned up, he’s washed. He looks *great*. He looks like he should be in a magazine and he’s just there camping on his own. And then another time a bunch of hunters, guys that were hunting, they were there and they had their rifles and they were hunting and they talked about their game and all that kind of stuff and for me it was just being exposed to different people that I normally don’t have a lot of contact with. For me, it’s that unexpected of who you get to meet out there.”

Experiencing Willmore with others (e.g., good friends), resulted in confidence-building and a sense of accomplishment as described by one respondent. This was congruent with the findings

of Fredrickson and Anderson (1999) where two women's groups were studied during two different outdoor recreation trips. It was found that the physical challenge associated with wilderness resulted in some of the study participants feeling a sense of enhanced accomplishment which improved self-confidence and self-esteem (Fredrickson & Anderson, 1999). In their study, being in an all-women's group was an important aspect along with other sub-themes. Perhaps for Mona and Sandra, having another woman in their group (besides themselves) helped to boost their confidence. When describing their special places, locations they thought they may not have had the opportunity to experience, were made possible:

**(Mona)** "Some of the places that we've been especially Sandra and I, the men not so much maybe, but we thought we would never do it. Then we would do it and then we'd think there, that's one more thing and then every year it gets a bit easier with that particular spot so I guess, you know if we say okay, if we said Lightning Ridge, if someone had told us that we were going to go up there we would have said, you've got to be kidding, but as we do it then it makes it easier to go further into the wilderness, you know like you get a little braver so I guess in that case some of these spots/places we thought we wouldn't experience because of fear in a sense."

The theme of social bonding also included ancestral connections or family ties as described by one participant. This aspect has strong linkages to the historic and cultural ties theme:

**(Anthony)** "Just knowing that my ancestors have all used it so much and to be able to ride out there and maybe ride over a pass and say well how many of my grandfathers have seen this. I know my dad has seen it all but my grandfather I never knew him but he had been all through there so and it's interesting some campgrounds you get into you know you'll see a blaze on a tree with names on it of people that passed away years ago, you know they've been there, their name is on that tree. Even that cabin at Big Grave, there's names in that cabin from the early 40s. I don't know how many, like there's hundreds and hundreds of names written on the wall in there. (Crash – horse grabs tape recorder). The names of people I know that have been in there in the 40s and 50s. They're no longer with us."

According to Schuster, Tarrant, and Watson (2005) experiencing wilderness as a group consisting of either family or friends has many potential benefits: increased trust with one another, the development of new friendships, improved group interactions, and the fostering of cooperation in achieving common goals. Experience preference research has revealed that many visitors seek social bonding with friends, family, and others that share similar values in wilderness backdrops (Roggenbuck & Driver, 2000). Social interactions through group experiences have also been shown to contribute to spiritual inspiration and experiences in

wilderness (Fox 1997; Fredrickson & Anderson, 1999). Previous place meanings research has identified the social aspect (i.e., friends and family) as a resultant place meanings theme in a variety of settings such as an urban natural area (Spartz & Shaw, 2011), marine park (Wynveen et al., 2012), national park (Brooks et al., 2007; Smaldone et al., 2008), wilderness areas (Dawson, 2007) and special places situated within public and private lands (Schroeder, 2002). Social interaction has been found to be one of the emergent dimensions in the development of place relationships along with: time and experience accumulated in place, physical interactions in and with the setting, and a reiterative process of self-identity affirmation (Brooks, Wallace, & Williams, 2006). Wilderness therapy through group ventures can be conducive to participant healing for people from a variety of backgrounds (Todesco, 2003). This has been the premise for popular programs such as Outward Bound, therefore illustrating the linkage between social bonding and the escape and restoration theme, which will be described in an upcoming section.

#### **4.2.2.3 Activity**

It was common for respondents to describe the park as a functional landscape that facilitated opportunities for their activities, recreation, or work. This occurred for visitors that used the park as a backdrop for commercial purposes or for personal activities and pursuits or both. Common commercial activities included: horse outfitting, hunting operations, and guided hiking. Other typical activities included: hiking, backpacking, hunting, horse-riding or horse packing, horse-assisted hiking, mountain-biking, fishing, nature observation, teaching or learning (i.e., ecological, historical, or traditional-use) and photography. Some users enjoyed Willmore for winter activities such as cross-country skiing and snowshoeing. Less common activities included horse and wagon and trapping. Activities were done solo or in a group, but as described in other themes, most people in Willmore travel in groups. There was evidently a social aspect to the activities theme. One respondent for example, described in general how she enjoyed the physical and mental aspects of long distance walking:

**(Maria)** “Long distance walking is what I really like to do and in places that are not densely urban (okay) so there’s clearly a physical aspect to it as well, I would say, just listening to myself. The effort is good for the body and it sort of quiets some of the things like the busyness of the mind.”

Maria’s general enjoyment of long distance walking was transferable to the hiking and ridge walks that she enjoyed in Willmore. As described by Miles (1987) the physical demands of

wilderness may lead to healing and wilderness in general has great potential in the enhancement of physical well-being. It could be posited for some people, the importance of Willmore for an activity may have went beyond just the activity. The importance may have encompassed an aspect of physical fitness, and the associated physical and mental benefits that the activity may have provided. These benefits may be exemplified by the wilderness setting which often demands physical endurance and skill during extended periods (Miles, 1987; Roggenbuck & Driver, 2000). Dawson (2007) found physical activity (i.e., physical exercise or health and physical challenge), as being one of the main dimensions of wilderness experiences, related to place within seven wilderness studies in the northeastern U.S. Another participant commented on the wealth of recreational opportunities that Willmore afforded visitors with backcountry experience:

**(Craig)** “There’s lots of opportunities depending on what tourists might want to do there. Anything from ridge hikes to photography, fishing, all those kind of things, wildlife observation, but it’s mainly for the *seasoned* backcountry user.”

A commercial user commented on the general functionality the park provided:

**(Charlie)** “You can give people a much better experience in Willmore and private people whether they’re horse users or hikers can have a much better experience in Willmore so it’s really a better, it’s a much more useable park for everything.”

Willmore was clearly a suitable location for many horse users. Many respondents commented about the horse-friendly aspect of Willmore and characteristics of the park that made it so:

**(Craig)** “I find that Willmore is probably more of a horse-related park, more of an equestrian friendly park in a lot of ways.”

**(Frank)** “The horse part is very important to us, in Willmore there are vast open meadows for horse grazing.”

This was similar to Wynveen, Kyle, and Sutton (2010), where facilitation of desired recreation activity was an emergent place meanings theme for visitors to the Great Barrier Reef Marine Park. Visitors to the reef described how certain physical attributes of the setting facilitated their activity. These researchers also described how meanings accumulate in places through interaction with the environment. In Willmore, visitors accumulate meanings through their activities, which are facilitated in Willmore, and accumulate experience through time.

Not all the participants agreed with all activities that were occurring in Willmore. One participant discussed how he was disappointed that trappers could use OHVs during certain times of the year:

**(Ricky)** “You know I hunt and trap and I don’t even like these guys that are trapping up here because they go in with their quads and here you’re telling your clients from Europe there’s no motorized vehicles and then there’s quad tracks going down the trail because you know they’re allowed two weeks before season and after season.”

Another participant did not agree with hunting and trapping within Willmore: “we don’t agree with trapping or trophy hunting in a provincial park.”

Many respondents pointed out that Willmore was not for the novice visitor. It attracted a certain type of individual. Respondents alluded to Willmore being a place for the experienced backcountry traveler. It was suited for those, who had developed skills and abilities for wilderness travel:

**(Kimberly)** “Willmore, it is a little bit more remote and it doesn’t have the services, so I know I’m comfortable there, I know that I wouldn’t just take anybody there, I think you have to have a certain degree of comfort and experience in the outdoors to be comfortable in Willmore, because it isn’t necessarily, yeah you’ve got those horse trails, but going off trail you’re making up a lot of the stuff, you’re what I’m called, what we call, what is it, you’re doing your own route finding and navigating. Trying to find, game trail, so you have to be somewhat comfortable and you have to have some skills in the outdoors so Willmore isn’t for everybody, it’s not for the tourist that needs to go Jasper and have everything signed and perfect for them”

**(Scott)** “But certainly Willmore as opposed to you know the national parks has a totally different feel. I mean when you’re out in Willmore there aren’t the established trails. I mean there are horse trails but you know when you come to a junction you’re probably not going to find a sign you know so it’s a much more independent sort of experience. You really need to know how to route find and read a map as opposed to follow signs.”

**(Margaret)** “I’d describe Willmore Wilderness Park as a pristine wilderness area with gorgeous landscape: allot of scenic large valleys, meadows and passes, and gentle ridges – which are quite easy to hike on. I’d specify that it is a wilderness park (no bridges, only a few trails...) so people need to be self-sufficient (outdoor experience, skill to use maps, compass...).”

**(Charlie)** “It’s far more wilderness than even a park like Jasper, mostly because in Jasper they’ve overdeveloped it in terms of trails and bridges and signage and it’s almost like backcountry highways there and so I mean anybody can go there and you don’t have to be able to read a map or get your feet wet or so that attracts a certain kind of person. Willmore being not so developed and you know it has been left more to the users to you



know cut a trail here or there or clear a trail or if need be and so it's never been, it's never been developed to a point that anybody can go wandering around in there and expect to find your way around. You have to - you have to be a little bit different type of person especially to get into the real remote spots."

The element of challenge associated with travel in Willmore was evident. Words and descriptions such as *challenging*, *rough country*, *work harder*, *difficult* and *rugged* were used by participants. For some respondents the element of challenge or effort was part of Willmore's appeal. The challenge associated with accessing Willmore kept visitor numbers low:

**(Luke)** "I don't think that access should be improved because that will just increase the number of visitors. I think people who go there have to really make an effort to go there and I think that's good, you know, yeah, I think that's part of what makes it a great place."

**(Corey)** "Willmore is very difficult to describe and I describe Willmore to people that are inexperienced as being difficult (emphasize). It's undeveloped and therefore it's less accessible. You have to work harder (pause) you know. That's what I love about Willmore."

Place meanings related to outdoor recreation activity was common in the place meanings literature (though it was named differently or categorized with other themes). For example, Bricker and Kerstetter (2002) in their study of whitewater recreationists, identified recreation as a main dimension consisting of four sub-dimensions: a starting place, skill or learn, enjoyment or excitement, and access or convenience). Smaldone et al. (2008) had identified outdoor recreation in their study in Jackson Hole and Grand Teton National Park, Wyoming. Spartz and Shaw (2011) suggested from their study of urban natural area users that engaging in consistent activity within a place may be a conduit to deepening place connections through positive aspects of the activity and the setting. In this study, Willmore provided a wilderness backdrop where users engaged in a variety of activities as either individuals or groups. Though Willmore provided a wealth of wilderness activities, it was not described as a place suitable for everyone (e.g., novices). Not all participants agreed with the suitability of various activities that were permitted in Willmore. This illustrated, that within overarching meanings people may hold multiple meanings.

#### **4.2.2.4 Unique Physical Landscape**

It was evident that many respondents were drawn to the unique scale and physical landscape of Willmore. This included: the physical geography, topography, and geology. The

uniqueness of the landscape was related to the aesthetic theme and the appreciation of the beauty that the landscape offered. This theme also related to the size and intactness of Willmore. Many respondents classified this as being unique. It was common for participants to describe Willmore as being *big*, *large*, and *vast*. Many participants contrasted and compared Willmore to other parks such as the mountain national parks (e.g., Jasper National Park) especially in relation to the unique physical geography of Willmore in comparison to some of the other parks. The unique physical landscape features of Willmore appeared to help facilitate respondents' activities of interest such as hiking and horse-riding. There appeared to be a special connection to the ridges and mountains of Willmore for many participants. This connection seemed to be fostered by physically accessible ridge terrain that visitors in certain parts of the park were able to access without having specialized gear or mountaineering skills. The unique physical geography of the ridges also promoted fairly quick access to the alpine in comparison to other parks. One respondent denoted Willmore as *walking in sky country* due to its exceptional and expansive ridge walks and views. Two participants specifically referred to the *accessible* and *human scale* of Willmore. For example:

**(Maria)** "Well because of the geography for one thing as I said the great open valleys. When you get farther into the mountains then it draws you tighter but in Willmore they're more spread out and the ridges are reasonably accessible so that, well I mean I'm 62 and I'm probably more fit than most people my age but I'm not, you know, I'm not a marathoner, I'm not anything particularly special and I can do this stuff. So that's a real gift that comes from the geography as much as anything else."

**(Luke)** "It's at a scale that feels more accessible, like it's huge, but most of the mountains in Willmore are not huge, and you can walk to the top of most of them, right, so it doesn't have the kind of austere quality that most of the Rockies' have and of course there are parts of Willmore on the western side that are of that character but it's sort of a gentler landscape right and in that sense it feels more hospitable."

**(Ana)** "These are front ranges which were formed differently than the main ranges, on the same tectonic plate action but these are different mountains. You see different things. You can actually get on top of these mountains and not be a mountain climber. You know they are lower, the valleys are higher. I mean there are spectacular mountains in the main ranges don't get me wrong but I don't do ropes so I can't get on top of those mountains and we don't conquer mountains here we just get on top of them and the main ranges are conquering mountains. We don't do that here."

**(Christopher)** "The nice thing about Willmore is you can get into the alpine with a climb of only what? 500 meters or maybe even less than that, maybe even only a couple of hundred meters depending on which ridge you're heading for so and the trees on the

south slopes often only go up about half-way up the slopes and you know that's usually a pine slope so they're very evenly spaced. It's all growth and you can move through them quite easily so you can get up on the ridges almost anywhere so you can go cross-county all over the place in Willmore."

Through these mountain top experiences, participants experienced a variety of emotions. Some emotions appeared to border on spiritual and personal enlightenment. The unique physical landscape of Willmore seemed to induce or facilitate through a variety of factors, the ability for some to have these extreme moments of self-revelation. For example:

**(Ana)** "The best thing in the wilderness is to sit on top of a mountain and it's absolutely silent and you feel incredibly insignificant and there's wherever you look, there's no evidence that people have destroyed things and that's why I'm here is that feeling of insignificance, it's very humbling, a very humbling feeling and all sorts of weird and wonderful unusual things happen when you can be quiet and sit and watch. The vistas are unique. You don't find them anyplace else and little things you know, butterflies and spiders and moths and flowers and unusual rock formations and tree formations and you just have to look, just look, be quiet and look."

**(Christopher)** "That hike along that spine is just amazing and the people I have taken on it have said this is one of the top experiences of my life and they mean of their life of hiking - the *number one experience*. The people that went into Upper Hard Scrabble with me a year ago, they'd never seen anything like it."

Experiences such as this may be considered peak experiences (Maslow, 1982) or flow experiences (Csikszentmihalyi, 1990). This type of experience is such an intense experience that one's sense of self may be temporarily lost (Fredrickson & Anderson, 1999). Normal subject or object distinctions dissolve and the person becomes one with the present moment (Fredrickson & Anderson, 1999). According to Fredrickson and Anderson, these experiences occur in a natural environment and can result from a high degree of emotional and or physical challenge. This can also be considered a transcendent experience. Csikszentmihalyi suggested that flow experiences are "the best moments of people's lives" (Csikszentmihalyi, 1990, p. 3). Fredrickson and Anderson (1999) discovered in their study of women's wilderness trips and spirituality, that some participants described what could be considered a religious experience. This resulted in "an intense and pressing recognition of one's insignificance in the larger cosmos and a heightened recognition of the interrelatedness of all life-forms, ultimately leading to feelings of peace and humility" (Fredrickson & Anderson, 1999, p. 370). McDonald, Wearing, and Ponting (2009) examined characteristics of wilderness settings that resulted in triggered peak experiences, and found aesthetic qualities to be the most common emergent theme. Wilderness settings often

convey immense and vast physical qualities which dwarf humans in comparison “by their sheer size, age, ecological complexity, and uniqueness” (McDonald et al., p. 376). These researchers found commonly noted objects of attention from their participants’ peak experiences included “sunlight, forests, mountains, wild animals, and valleys” (p. 376). Unlike a peak experience which according to Maslow (1999) “is only good and desirable, and is never experienced as evil or undesirable” (p. 92), one respondent described a different *energy* which seemed to be linked to undesirable feeling of not wanting to camp in a particular area though the area was visually interesting. This *energy* was linked to a particular location with very unique and interesting geology and rock formations.

**(Patricia)** “There’s also the rocks, they’re different in different areas of the park. There’s a fossil area and real limestone rocks that we went into which is up at the end of Twain Creek. You are on the fold of some major land upheavals so the rock is really, really, convoluted and it gives its own energy up there too and there was this one ridge that we were travelling down, it looked like shark fins sticking out of the water, it looked like the backbone of a dinosaur maybe or something, it’s all rock, but the area too had this kind of, it was a place that you didn’t feel that you wanted to camp. It had its own energy there.”

Willmore’s unique physical geography also contributed to feelings of freedom for one respondent:

**(Maria)** “Being able just to walk so it’s that feeling of openness and freedom that I feel particularly there so that certainly would be one thing. And that can happen in Willmore more easily than some other places sometimes.”

For some horse users, Willmore was viewed as being more horse-friendly which related to the physical landscape features such as *horse-friendly rock*:

**(Patricia)** “Some of the more southerly parks, the provincial ones on the BC side are more heavily timbered - so you kind of have to know your trails, especially if you’re using horses because horses can’t just travel on any kind of rock. Where Willmore is more horse friendly I would say.”

Another respondent found Willmore to vary from mountain national parks due to the physical expansiveness of the valleys:

**(Charlie)** “It’s large and it’s unique in that it has these large open valleys which are very scenic and that’s basically what sets it apart from most areas in Jasper and other parks, other mountain parks.”

For another, the appeal of Willmore was related to the physical ecological diversity of the park:

**(Luke)** “Beauty of course is an important part of what it offers and the diversity of ecological communities, you know and the variety of altitudinal environments, it gives you the range of plant communities and creates a diversity that makes it very appealing.”

Though it could be argued that many parks have their own unique physical geography, it was evident for some respondents that the unique physical geography of Willmore contributed to their place meanings and attachment to the park. Their physical geography was also intertwined with other themes such as aesthetic appreciation, social bonding, spiritual, and solitude.

Gunderson and Watson (2007) found through their study of place meanings in the Bitterroot National Forest, Montana that physical features of significance had emerged as a place meanings theme. Through their study of place meanings ascribed to the Great Barrier Marine Park, Wynveen et al. (2010) found that visitors viewed the park setting as a unique natural resource. For example, visitors felt strongly that the diversity of wildlife could not be found elsewhere and the park represented an entirely different world from terrestrial environments.

#### **4.2.2.5 Spiritual**

This theme encompassed spiritual experiences, moments, events, or feelings that were described by participants. This theme was related to other emergent themes including aesthetic, unique physical landscape, activity, social bonding, solitude, and escape and restoration. Previous research has identified why being in natural areas helps foster spiritual outcomes including 1) being in nature, 2) being away, and 3) place processes (Heintzman, 2009). For example, in a study of Teton Pass, Wyoming backcountry visitors, nature and the backcountry setting (95%) was found to be the most important attribute of spiritual experiences identified by participants (Marsh, 2008). Other factors besides setting components which may influence spiritual outcomes are: antecedent conditions and recreation components (Heintzman, 2009). Though the term spiritual can convey a religious aspect, most empirical outdoor recreation researchers allow study participants to self-define the concept (Heintzman, 2009). For example, Frank described being *overwhelmed by nature and God especially at the tops of mountains* while others described emotions such as *peace* and *humbled*. Some participants had directly used the word *spiritual* to describe their relationship to the park and nature, as well as emotions related to memories and experiences. Spiritual experiences occurred when alone and with others (e.g., friends or family). Even when travelling within a group, there appeared opportunity for some to

experience spiritual moments. For example, one respondent described a memory which entailed a spiritual experience:

**(Corey)** “Specific memories I recall are very exciting times riding over Indian Head Trail, overnight in the dark in the moonlight. It was a moonlight night in early June and absolutely perfectly clear and we just decided we’d carry on and we rode and camped at the sunrise and it was just with a friend of mine who’s, actually there was two friends of mine and they’re both deceased now so it was kind of a special memory, like it was a memory to that and it was exciting because we saw moose and caribou in the moonlight on the trailhead and that’s just, that was pretty spiritual almost.”

The same respondent alluded to what could be described as a spiritual connection to the history and traditions of Willmore. It could also be described as respect for what he felt was a spiritually personal dimension of Willmore:

**(Corey)** “It is somewhat spiritual and it is truly historical. I mean the Métis culture is certainly part of it, the trapping history, I don’t even know if it’s all Métis necessarily. I don’t think you can define the culture that’s there as Métis but my wife is Métis but from the true Métis culture which is certainly doesn’t have nothing to do with what people have built it up to be in their sentiment, in their current literature but there’s history there you know and there’s people that were there and there’s people that lived there and people that went through there and there’s graves of people that were there and they come and visit you when you go up there so there is a spiritual sense of Willmore, yeah, you can’t justify that to politicians or rate payers or oil companies but there’s something quite spiritual about Willmore and part of it is being able to identify the history, seeing the old cabins in the old corduroy, and getting on the top of a hill and finding an old knotted piece of rope that man has been here for 50 or 75 or 100 years somebody else was here. I find that really quite moving and I say it’s really hard to describe and that’s something you can’t share with other people.”

The spiritual aspect of Willmore seemed to tie into a deeper level of meaning beyond Willmore as just a functional backdrop for recreation. It was also a place of worship and fostered a connection to nature. One respondent contrasted Willmore with the lyrics of the song *Church of the Long Grass* by John Wort Hannam (please refer to Appendix O for the song lyrics):

**(Luke)** “I’d like just to emphasize the spiritual/religious importance for me and I know that that’s not just my experience, I know that’s true of many of the people that I go there with, that it’s a place of, you know, what’s his name? Luke Wort Hannam with The Church of the Long Grass, do you know that song? He’s a folk singer, songwriter, from Fort McLeod or Pincher Creek down there and he’s got this great song about the Porcupine Hills as being the Church of the Long Grass, right (emphasize) and for me these places are sort of that nature. You know they’re places, it’s like for me going to the cathedral you know, that central place of worship not that, I don’t go there and get on my

knees and pray per se but for me it's very much a religious, spiritual, experience being in these places and it's not just a recreational activity, you know, it has that level of meaning for me."

This coincides with how Dearden and Rollins (2009) described protected areas. They were similar to a cathedral, where people may go in a quest for spiritual fulfillment from nature and where sites like this help people "appreciate the existence of forces more powerful than ourselves and remind us that humility is a virtue" (Dearden and Rollins, 2009, p. 7). This related to mention of Willmore having sacred qualities when describing the scale of spiritual experiences for the following participant:

**(Luke)** "Yeah, it's not really a particular place. It's more like when I go there from the city, it takes me a day or so to settle, right and to kind of completely arrive and then once I'm there then just being there is that experience no matter where I am there (emphasize), you know, I could be walking on a trail, I could be sitting on a ridge top, it could be just sitting around the fire or whatever but it's like being in the presence of some place that's very special and has some of the qualities of the sacred you know."

Another respondent while describing his relationship with Willmore recounted a story which could be described as a spiritual encounter:

**(Frank)** "In Willmore you can see graves and you know people lived and died there. One story that stands out was when I was younger, my horses took off and were running forever, I was young so I was chasing after them, nothing would stop them, that is until I finally caught up to them and found them gathered around a human skeleton. It was almost like the skeleton had halted the horses."

Other respondents such as Patricia described her emotions for Willmore as being *peaceful*, *awe*, and *spiritual*. Patricia also highlights the social aspect and her relationship to nature through what she calls a spiritual relationship with Willmore:

**(Patricia)** "Well I suppose it would also be a spiritual experience, like you're there with nature and you have your horses and the people you're with and it's like a relationship with nature. I'm not sure how to explain it but like it isn't a scary experience."

As revealed by the in-depth survey results from this study, the motivation to grow spiritually was rated low in comparison to other visitor motivations for visiting Willmore. This could be due to a few reasons. For example, it was possible that visitors who experienced a spiritual aspect of Willmore were not expecting or planning for it, and it became more important once it was experienced and discovered. Another possibility as mentioned by Roggenbuck and Driver (2000)

is that spiritual motivational items may be “too simple and global to capture the complexity and tremendous breadth of the human spirit nature interaction” (p. 43). Roggenbuck and Driver (2000) indicated that spiritual benefits may be “among the most special and valued of all wilderness benefits” (p. 43). Heintzman (2012) asserted that an improved understanding of the spiritual dimension of experience could improve general park management. The main challenge is for managers to consider how to maintain spiritual values and how to potentially facilitate opportunities where appropriate. Often “the spiritual realm is usually relegated to the background of wilderness stewardship, often alluded to, but seldom incorporated in planning management, and educational programs” (Kaye, 2006, p. 7). Spiritual place meanings have been identified through the literature, although references to the spiritual dimension were sometimes referred to in different terms. As discovered throughout this section, the spiritual dimension may be multi-dimensional and intertwined with other themes such as aesthetics, solitude, and escape. Smaldone et al. (2008) categorized spiritual as a component of the inspirational place meaning code in their study. Inspiration was a combination of three codes (inspire, feel insignificant, spiritual). Schroeder (2002) did not separately categorize a spiritual theme, but it was alluded to through other themes such as beauty. The spiritual theme was intertwined with the traditional, cultural and historic theme which is discussed next.

#### **4.2.2.6 Traditional, Cultural and Historic**

This theme encompassed traditional, cultural, or historic connections to Willmore. Some respondents had historic family or ancestral ties to Willmore and the surrounding area. Others had a deep appreciation for the traditional aspect of Willmore, including aboriginal use and history of the park, early explorers, and outfitters. This theme also encompassed an aspect of exploration. This related to some respondents stepping back in time and envisioning what it might have felt like to be the first in an area, or imaging the camps of early Willmore inhabitants. Traditional, cultural, and historic is closely tied to both the social and spiritual themes. Some respondents had an evident relationship to Willmore through traditional and historic family ties:

**(Anthony)** “My family has used the Willmore for well over one hundred years and that’s before the Willmore was Willmore because my grandmother, her family lived in Jasper Park before it was park and before Alberta was a province and they traveled and hunted and trapped through the Willmore for years before Alberta was even a province and my grandfather was one of the first outfitters in Alberta.”



**(Charlie)** “It’s very much a spot that I’m fond of because I’ve spent a ton of time in there and I wouldn’t have done it if I didn’t like the place and dad was kind of instrumental through Willmore in establishing it as a wilderness park. You know in his day they’d put some of those existing access roads in there due to fires and of course they seismographed that whole country in 1955 which basically put a dozer track in there and so that scared the crap out of him even back then because he could see that people were going to access it with wheeled vehicles and once that started it wasn’t going to stop and I mean that was before ATV’s and anything else. So through his efforts and other people they had the Minister then, Norman Willmore, establish an Act that gives it some protection and you know thank God those guys had the foresight.”

When describing his feelings arising from visits to locations that had ancestral ties, one respondent described a trip memory where history and tradition were being passed along and shared with children and youth. This experience resonated deeply with Anthony not only due to the connection with youth through teaching, but also through traditional, historical, and spiritual aspects of the trip:

**(Anthony)** “We had 18 kids with us or youth and you know you’re riding around and looking at some of these historical sites and telling them about it. There was, the kids got pretty emotional at times. You know because it was all new to them. A lot of them had never rode a horse for more than half an hour and we rode them for two weeks so it was pretty good and then we visited some gravesites out there and we put a spirit house on one of them. It was a, you know it was a trip that I’ll never forget because of the kids that were on it. The way those kids reacted to most things, like you can’t describe what you saw or anything, you had to be there and it hit them pretty good, you know, the history that they were learning. There were some good kids.”

Other participants described an appreciation and keen interest in the historic aspects of the park. They enjoyed the discovery associated with discovering historic camps or park historic features, such as the steam tractor near Pope Thoreau:

**(Leroy)** “We cut back through different bush, we found some old whole campsites actually back that hadn’t been, I don’t think it had been visited for 25 or 30 years. There was some wood cut with axes you know and the wood was completely powdery laid in the stack there for a while, I mean it would take a long time there for wood to do that you know. There was some old tobacco cans and old stuff we found around and I’ve never, I used to smoke when I was young and I never, never saw them brands so they must have been back in the 30s or 40s I’m thinking. Yeah it was kind of exciting just seeing where these guys used to camp at.”

**(Corey)** “That’s one of the things that we try to, I try to track history because I love history and you go around and how old have these camps been here and how long have these trails been here and these slashes and those roads, those resource exploration was in the 50s, that’s 50 years ago and you can still see the tire tracks.”

Congruent to this theme, Smaldone et al. (2008) identified the place meanings theme of cultural or historic importance. This related to the area being important because the culture or people of the location. A heritage theme related to the Gold rush era in California was identified by Bricker and Kerstetter (2002) in their study of the meanings of whitewater recreationists. An interconnection of components including family and history was identified by Davenport and Anderson (2005) as part of the main identity meaning in their *web of river meanings*. In Schroeder's (2002) study of special places, family history and heritage were identified as special place meanings themes. Schroeder had described how special places could help draw a more encompassing sense of historical heritage stemming back into time (Schroeder, 2002). In their study of Bitterroot National Forest users, Gunderson and Watson identified familiar, historically important, or tradition as a place meanings theme (Gunderson & Watson, 2007). This theme was identified by both indigenous and pioneering families of the area when identifying their special places and included such things as experiences, traditions and family, and cultural ties (Gunderson & Watson, 2007). Places of cultural significance that were never or seldom visited (e.g., the entire forest or particular travel routes) were considered important due to ancestral ties and past and current historic use. In his New Zealand wilderness study, Wray (2009) revealed that wilderness users enjoyed discovering evidence of human historic park artifacts. His findings also suggested that New Zealand Wilderness recreation was a way in which participants were able to re-enact the pioneering experiences of their ancestors, and to learn more about their country's history (Wray, 2009). Within this study, descriptions provided by participants seemed to support this. For some, recreating in Willmore helped convey a sense of nostalgia and appreciation for a traditional or historic way of life associated with their ancestors, past explorers, early outfitters, or adventurers.

#### **4.2.2.7 Freedom**

Many participants described various aspects of freedom in relation to Willmore. Freedom was described as non-restrictiveness or being unconfined. Phrases and words such as *under your own control*, *go where and when you want*, *no fees*, *less physical restrictions*, and *freedom* were used by participants. Freedom from rules and regulations is an important aspect of the wilderness experience (Johnson, Hall, & Cole, 1995). McCool (2004) defined an unconfined experience as "one that is unlimited, unrestrained, and unrestricted" (p. 16). Park visitors have the freedom to determine their camp location, trip route, length of stay, and if they would like to have a

campfire or not (McCool, 2004). Willmore users have the rare opportunity to experience freedom as a result of Willmore having minimal rules and regulations. This fostered a flexibility and spontaneity, and provided a non-structured and dynamic atmosphere. Many participants contrasted Willmore with mountain national parks, which they viewed in a negative sense. This was mainly because of the many rules, regulations, reservation requirements, and fees (and higher numbers of users in certain areas). Participants greatly valued the freedom that Willmore offered along with the spontaneity it allowed. In Willmore, there are no trail permits, user fees, campsite reservations, or designated camp spots, and one may build a fire or construct a shelter where they choose. Visitors can begin and end their trip at their own convenience and are not tied to a set schedule or fixed route. Their trip can be adjusted according to the weather, how members of their group are feeling, or the condition their horses. This seems to result in less stress for the traveler. For example Corey described himself as being a law-abiding citizen and how he felt bad when he was camping in a national park and overstayed his permit:

**(Corey)** “When I’m at the wrong camp with the wrong permit I feel bad (emphasize) and you know sometimes you’re in Banff and whoops we didn’t get out of here and someone comes along and checks.”

The lack of rules and regulations also seemed to foster opportunities for discovery and exploration rather than being confined to a set route, destination(s), or itinerary. The resultant freedom also seemed to contribute to participants’ feelings of self-sufficiency and independence:

**(Corey)** “Everything about Willmore is happy and from a trip point of view and again that’s going to say comparatively compared between national park, you can go to Willmore and with the confines of being in wilderness and having to depend on yourself, you’re not confined to having to make  $x$  number of miles a day and camping in an exact situation and only having to spend two nights in that camp before you have to move on, you are under your own control, but you’re at your own risk. I don’t find that a threat at all. That’s why we go.”

“I spent all my childhood in Jasper. My grandfather was in Jasper before 1928. My family was raised there so I know a lot about Jasper and Jasper is really difficult. If you’re a horse person, they make it difficult for you in Jasper. Banff is tolerable. There’s people who will help you but Jasper has set up a process where you can get permits but none of the trails are continuous so you can’t plan a good trip. You can’t make a loop and I don’t know if that’s intentional or not but it’s really difficult to do a good trip in Jasper. Some good trips yet in Banff, (pause) but yes absolutely you have to know. Unfortunately it’s like hunting, you have to draw for a hunting license, you have to know where you’re going to be for what weekend and what time and I don’t always know that. Willmore I can say let’s go next weekend, we’re free, the weather’s good, load up the horses and go.

Jasper you've got to say, no, no, we've got to plan the first week in June and the last week in July, we're going to go and you've got to know six months in advance and you've got to get on the phone and make all the reservations and you can't always count on when you can get away or when you can do that. If you were a professional outfitter and you were going to take a series of trips during the summer you can plan the weeks and then you bring the people into your trips. We want to go on our own trip and so Willmore if we decide to go, we go and if we get up and we look at the calendar and we look at the weather report and it's snowed in up at Grand Cache we go to Clearwater. We can just change our mind and go."

"The advantage of Willmore is that when we know we can go, we can go, and we get in there then we'll go as far as you go and you don't always know how the horses are going to work out and sometimes they are fat and lazy and you don't get as far as you think so you stop over an extra day while the horses get conditioned and when you're in Jasper and Banff you've got to, you've got to have the permit tied onto your saddle horn or you've got to know where you're at, at what days and it doesn't always work that way."

**(Frank)** "Willmore is better horse-country than all of the other parks except for Jasper National Park. Jasper has more rules and regulations though. It's not that I don't like the other parks, but for example if it is pouring rain, if you have a permit you have to move on though you might like to stay an extra night. In Willmore you can stay longer if you are tired or are injured." "Jasper seems to be becoming more welcoming to horse people. Have some connections to Jasper people, used to not like to pay the fees."

**(Kimberly)** "It's less physical restrictions, it's like okay I can go walk wherever I want, I can, if I need to build, choose to build a fire, I can. There's nothing saying oh God, you can't chop down that tree or you can't do this, so it feels like if I want a wilderness experience and I want to build a fire and I had to build a shelter or something, I wouldn't feel like Oh my God, there's all these rules about something, it feels to me like a very clean, tidy place that I can still make a choice about where I want to put my tent and where I want to, you know, if I want to build a fire or not or something like that, using my judgment."

**(Luke)** "Willmore is as you know, it's different from many other wilderness areas that are open and available, it's different from the Parks, you know, in that it's not structured in that way and there are fewer people and there's fewer constraints in terms of movement within and what you can do and where you can camp and all that, right, so it feels like a freer, more natural experience in the wilderness than the National Parks for myself."

Davenport and Anderson (2005) identified freedom as being a component of a range of recreation experiences enjoyed by river users. This was part of their *river as tonic* dimension in their *web of river meanings* for the Niobrara National Scenic River. In contrast, Wynveen et al. (2010) found that their marine area study participants associated freedom with escape from the everyday. It is not surprising that freedom was not identified in many other studies reviewed in

the literature. There are few protected areas having minimal rules and regulations like Willmore. In general, there appeared to be few studies of place meanings within wilderness areas. It was evident the freedom offered by the Willmore experience was a rare and unique meaning to Willmore. Freedom will not be likely identified within the same context for other protected areas (e.g., national parks) or other wilderness areas in Alberta. For example, horses and hunting are non-permitted activities in the White Goat Wilderness Area and open fires are not permitted in Siffleur Wilderness Area (and is only accessible by foot). Willmore offers a rare combination of allowable activities, modes of travel, along with few rules and regulations. This equates to a unique and unconfined experience which is a rare offering within protected areas in Alberta.

Freedom was interlinked with other emergent themes such as activity, unique physical landscape, escape and restoration, solitude, spiritual, and undeveloped and intactness. The sheer and immense physical size of Willmore appeared to contribute towards freedom. It offered a large enough physical area for visitors to be able to spread out, discover, explore, and escape other groups which might not have been possible in a smaller sized area. There were interesting parallels between meanings of freedom that emerged from Willmore participants and those expressed by participants from Fiordland National Park, New Zealand. In New Zealand wilderness, there are no rules and regulations defining where to camp, where to travel, or how long to stay. This results in visitors being able to experience wilderness as they wish and on their own terms (Wray, 2009). Freedom also resulted in a sense of discovery and feelings of being the first in an area. This was also expressed by Willmore participants. This is discussed in the upcoming solitude and undeveloped and intactness themes since freedom appeared to be finely inter-linked with these two themes. Maintaining meanings of freedom presents an interesting challenge for protected wilderness areas. There is often a fine balance between the maintenance of freedom and the imposition of regulations. Fortunately, for Willmore at the present time freedom appears to prevail; however, with increased visitor numbers and subsequent management intervention, this meaning is at risk of being compromised. According to Hendee and Dawson (2001), visitor regulation can reduce aspects of “freedom and spontaneity that characterize wilderness experiences” (p. 5).

#### 4.2.2.8 Solitude

This emergent theme encompassed participant descriptions associated with encountering or observing few or no people outside of their own group. As discussed under the social bonding theme, a majority of Willmore visitors do not travel alone. Therefore, solitude within this study was not confined to only solo individuals, but also referred to a small group of people (which is more common in Willmore). According to Dawson (2004) solitude can be understood as separation from others and separation from the influence of others including distance, sight, and sound. Solitude was expressed by many respondents as being an important feeling and aspect of the Willmore trip experience. Solitude was intertwined with other emergent Willmore themes. These included: spirituality, freedom, escape and restoration, undeveloped and intactness, and social bonding. Johnson et al. (2005) recognized that different components of the wilderness experience (i.e., naturalness, remoteness, and primitiveness) were intertwined and related to the multi-dimensional construct of solitude. In a study of wilderness hikers to Shenandoah National Park, a majority of participants described experiencing solitude while being still, in the presence of natural areas (e.g., forests, water, mountains) and sounds, being away from other groups, and when quiet (Hall, 2001). For Willmore participants, the feeling of remoteness (i.e., being away from populated areas) was related to solitude for some participants. Similar to Hall (2001), solitude also included the quiet aspect of Willmore meaning free from hearing the sounds of civilization (e.g., automobiles, OHVs, etc.). For example, some respondents commented on the rarity of not hearing the sound of motors while in Willmore:

**(Leroy)** “It’s the only place I’ve ever been where I’ve never heard, I’ve never heard an engine for two weeks at a time you know.”

**(Anthony)** “There’s no motorized vehicles there and that’s what makes it nice. If you hear any noise out there, you’re probably making it yourself.”

Another participant described how his wilderness solitude was ruined by the unexpected overhead flight of a helicopter during his Willmore trip:

**(Corey)** “I’m playing my imaginary game. I set up my teepee in the wild and one guy in the middle of the week comes to check my hunting license, is coming in on helicopter, suddenly ruined. It didn’t ruin today, it ruined the two weeks you know. I’ll show you my hunting license. I’ll do whatever you want you know. I’ll give you whatever you need but just come in on foot or come in on horseback.”

This coincided with one of the 17 threats to wilderness resources and values identified by Hendee and Dawson (2001) which pertained to “excessive administrative access, facilities, and intrusive management” (p. 6). Willmore does not appear to be intrusively managed; however, mechanized access to wilderness by staff, managers, or trappers can negatively affect visitors’ wilderness experience. The use of motorized access (e.g., helicopter flights and OHV access) needs to be considered and alternatives sought where possible. This is important to consider from a park management perspective. The frame of reference of what is acceptable or appropriate in wilderness may be affected by the extent parks staff, managers, trappers, and researchers utilize motorized access (Dawson & Hendee, 2009). It should be questioned if the equipment is necessary or critical for the task at hand? Is there a non-motorized alternative that can be utilized? It was clear that respondents valued the solitude they found present in Willmore. Privacy seemed to be an important component of solitude which paralleled Dawson (2004) who described solitude as being a dimension of privacy. For some participants, there appeared to be an internal struggle between keeping Willmore to themselves and sharing it with others. This resulted in some respondents like Cory, feeling a sense of selfishness:

**(Corey)** “I feel very selfish when I am at Willmore because like I say I go there and think it’s my home and that’s what’s good about it and yet I still have that twinge of guilt that you know well you have to share it with other people and how do you do that and still maintain it but I think that we have Jasper and Banff.”

**(Corey)** “That’s why I feel selfish about the experience I’ve had with Willmore because it’s been very personal. Many times I can go over two weeks and not see a person and you can’t expect that to be on forever. You know if I could buy it, I’d buy it and then there would be no-one else there but you know that’s sort of my own personal struggle with knowing how important that is for me to have that privacy and yet to know that there’s thousands of others who want it and too and how do you. How do you hog that for yourself?”

Solitude was found to be important for some respondents in developing and enhancing their connection to nature. One respondent (Luke) indicated that he enjoyed travelling in a group; however, he required time away from his group during certain periods in order to connect with nature. Similar to other themes, respondents contrasted the solitude of Willmore with the characteristics of national parks:

**(Ana)** “You see grizzlies there in their natural habitat and their natural behavior, that’s one thing you see in terms of animals and you see no people - you see no people. As opposed to hiking in Jasper or Banff or Lake Louise and even Kananaskis, there’s other

people on the trail so much so that nobody talks. You know you just have your head down and you just keep going right because there are so many people that are using that area. On these trails it's almost a treat to run into somebody (laugh) so and you don't run into people on top of the mountain. There's not a gondola going up there. I mean you'll run into people on the main mountain trail for sure because it's one of the major access points but by and large mostly people are going into the wilderness which is a different mindset from the people who hike in Jasper and Banff and Kananaskis, it's a different mindset."

**(Christopher)** "Almost never on a hike that I've taken people on have we run into anybody because you stay off the horse trails and they're really astounded. I mean there's no place - imagine the Skyline Trail. Have you done the Skyline? There's a party going by right plus you have to camp with them if you're going overnight. So we did it in a day once but we saw about a billion people the way we figured it by the time we got to the other end."

"The hiking up there is wonderful, you know it's a *beautiful* big expansive meadow area with waterfalls and peaks and so on you know. I think it's much prettier than Sunshine Meadows, well in part because Sunshine is surrounded with buildings and people and walkways and stuff."

"You know compared to the Skyline Trail you've got to camp where they tell you to camp and even though in Willmore you tend to camp in the camps that are established, there isn't anybody there so it's not like you're going to find ten other groups there and twenty people camping with you overnight. I don't know how many people you've had in camps but when I pass through them I saw quite a few tents and they were all congested. Of course that can be a friendly group, I mean it's not that bad a deal but generally we have a small group of people and we have an isolated camp. We can't see any other camps and on our hikes we don't see any other people. You don't get that in too many places but it's true if you go into the backcountry of Banff and Jasper, way into the backcountry, not on a popular trail like Skyline, you won't see many people either."

Others described certain parts of Willmore having no human presence:

**(Charlie)** "That's kind of one of the advantages that Willmore has is if you have the wear-with-all and the ability and finances I guess to get into some of those more remote regions, maybe they'd be probably the only people that would be there that year."

**(Kimberly)** "Generally you go there and you go, it's *pretty* remote, there's not a lot of stuff there and you could be lost, you could be in there for days and weeks, not see anybody and not come across too many structures."

**(Ricky)** "It's a great place to be, I mean it's a great place (pause) and if you like isolation and not a lot of people you can go up there on a lot of trips and even the parking lots full, you just don't see a lot of people. It's a really nice place."

**(Christopher)** "We didn't see anybody you know. Ours was even the only outfit in the whole West Sulfur Basin."



The low numbers or absence of visitors in many regions of Willmore seemed to foster a feeling of being *the first person to an area* as described by the following participant:

**(Corey)** “It’s just sort of like a pilgrimage; you have to go to Willmore spring and fall. That’s just what I do and I think the reason we go there is that it’s a big area that you can go and you won’t see a lot of folks and we tend to make most of historically, most of our trips in the spring, end of May and the first part of June, you can go to Willmore and you’ll be alone. You’ll be the only person in that whole park and there’s something pretty special about knowing that. I used to know how many thousand square miles it is or whatever but you know you’ve got that area and you’re probably the only people here and you can kind of, you’re the first ones to the snow drift and the first ones on the Bella trail and you kind of pretend that you are the first person there ever and that is sort of the emotions that I really like and we go to other areas, well Jasper and Banff, in the backcountry you can almost get that and you go down to the Clearwater and Corral Creek up in Whitehorse even, you’re going to run into other folks, and there’s other people and there’s been other activity, but Willmore’s big and raw.”

“I don’t know how to explain it but a sense of exploring. You know like you want to be, there’s no place in Alberta where you’re going to be the first anymore, sorry, but you can feel like it.”

For another participant, walking the top of an extensive Willmore ridge fostered the feeling of being the first person to walk to the ridge:

**(Christopher)** “The ridges like the Starlight Range, there’s no trail on top of it and it’s tough to get up on and it’s tough to get off of in places although there’s a few places where it’s not so bad and when you walk up there nobody’s ever walked it. I mean it feels like nobody’s ever walked it. Of course people have but it’s exceptional you know like the Starlight Range must be 13 or so miles long if you walk the entire thing.”

There was a fine balance for some participants between being social and having the opportunity for solitude. Some enjoyed the intimate social aspect within their own group, but they enjoyed the not seeing people from outside of their group members.

**(Scott)** “You know I mean I like running into other people too because nearly when you always run into other people out there it’s a good positive experience there and great people and got stories to tell and so on and so forth but I kind of like going out there and knowing that I’m probably not going to see somebody as well, laugh. You know, so both aspects I like.”

Others enjoyed Willmore as it offered them a chance to get away from people outside of their group members:

**(Luke)** “My encounters with other people have been pretty brief out there mostly, like just sort of passing and I’m always interested in talking a few minutes and you know sharing knowledge but I definitely don’t go there to meet people and if it became that kind of place then I’d have to go somewhere else, right. Like the relative low concentration of people I guess is another important part of why I like Willmore. I go to Willmore to get away from people so but the occasional encounter isn’t a problem. I don’t hate people but I don’t go there and socialize.”

**(Corey)** “We tend to go in the off seasons up there so you don’t get the tourist camps and stuff, you know they’re there, I know the people that are in them, I know the people that use them but we tend to avoid them. It’s not that we’re shy but we tend to avoid them.”

Some participants felt their solitude was interrupted during hunting season:

**(Scott)** “Typically you know when you are in there in the summer months, you know July/August, and there is almost nobody in there. It’s not until mid-August and all the outfitters start to show up, right, and then it’s a totally different ball game (oh for sure) but for those summer months, you’re pretty alone in there.”

“It’s a very comfortable place to go if you happen to be going there in June or July because the outfitters aren’t there.”

**(Margaret)** “Willmore Wilderness Park is more confidential than Jasper or Banff National Park so we can find here more solitude, peace and quiet – at least in summer I’m afraid it’s not the same in the fall during the hunting season.”

Other participants mentioned that there were some busier areas in Willmore:

**(Charlie)** “There are a lot of places in Willmore that are used quite heavily as well. You know the first 15 to 20 miles. You know, Rock Lake and Hell’s Gate and Berland and those places. They get quite a bit of use but there are also areas that are oh, you hardly see anybody at all.”

**(Ricky)** “It’s a big area and those people disappear pretty quickly. They’re up there and you don’t see them, like that parking lot can be full and I can go up there and I might see one group of people or you might see their tents at Eagles Nest because 90% of people go to Eagles Nest, the rest of the Willmore barely sees anybody and you can tell that by Parks because the Parks the only place they patrol is really Eagles Nest.”

This theme coincides with findings by Manzo (2005) where specific places may become significant “because they afford people the opportunity for privacy, introspection and self-reflection” (p. 76). Kaye (2006) noted that wilderness settings, due to their sheer extent, often provide excellent opportunities for solitude. Kaye also describes solitude as being a mental state or a way of being that may result from isolation or being away from others. Within this context, solitude differs from remoteness which conveys a more physical aspect. In a study of women’s

wilderness experiences, Fredrickson and Anderson (1999) found that opportunities of solitude left study participants feeling refreshed and invigorated and allowed time for self-introspection. These researchers also suggested that, for several of their study participants, solitude may have also contributed to their spiritual inspiration. Solitude, though not always identified as the most important wilderness condition or characteristic for visitors, is often expected by many visitors (Dawson, 2004). The in-depth survey component of this study identified the motivations of enjoy quietness and be away from crowds ( $n = 88$ ,  $M = 4.67$ ), to experience solitude ( $n = 87$ ,  $M = 4.47$ ), and be away from other people ( $n = 87$ ,  $M = 4.18$ ) as being within the top seven motivations for visiting Willmore. This indicates that solitude was an important meaning to many Willmore visitors. In general, solitude was a common emergent theme for other studies within a variety of settings (Davenport & Anderson, 2005; Dawson, 2007; Smaldone et al., 2008; Wray, 2009).

#### 4.2.2.9 Escape and Restoration

Various participants discussed Willmore as being similar to a retreat or an area where they could get away from the pressures from everyday life. Phrases and words such as *peace of mind*, *at peace*, *tranquility*, *calm*, and *relaxation* were used to describe words, phrases or emotions that came to mind when thinking about Willmore. Escape was also related to a healing or replenishing aspect which resulted in positive feelings or emotions (e.g., happiness) for some:

**(Ana)** “Because most people unless you are working and living in the area they don’t ever get that in their normal lives in cities or offices or, they don’t get that so they come here to get that experience because it’s a different experience and most people that experience that come away with a better feeling, I don’t know how to explain it.”

“That’s the wilderness experience, so, yeah, you’re (emphasize) in nature, you’re in (emphasize) the wilderness, you’re totally surrounded, you’re immersed, an immersion thing.”

**(Luke)** “Happy - I’m happiest when I’m out there, yeah (pause). I feel at peace (pause). I feel like the world is a good place which I don’t always feel when I’m around lots of people in the city.”

According to Schroeder (1987) natural environments benefit individuals since they provide the opportunity to deviate from the artificial settings where they usually work and live. This provides a strikingly different experience. It has been found that for some people natural areas can provide an escape or refuge from the stresses of urban environments and repetitive schedules (Schroeder,

1991). This coincides with what was described by Luke and Ana. Willmore appeared to be an escape that provided the opportunity for immersion with nature and wilderness. This resulted in positive feelings or emotions. This escape and being away to some place different appears to have linkages to the spiritual emergent theme which was recently described. McDonald et al. (2009) discovered that peak experiences can be triggered through the combination of aesthetic enjoyment and renewal (i.e., escape from the stresses, pressures, busyness of humankind). Their research also indicated a potential linkage between peak wilderness experiences and spiritual expression which is noteworthy for valuing wilderness as a place of health and well-being (McDonald et al., 2009). Fredrickson and Anderson (1999) identified the importance of being in *true* wilderness for their female study participants. It allowed for them to be away from the pressures of modern civilization. For some respondents, being in Willmore emphasized their relationship to nature which had a healing associated with it:

**(Luke)** “Nature is vital and a central importance in my life. It’s very important to me. It’s not just recreational for me although it is that, but it’s, its very central to my sort of religious and philosophical view or experience of my place in the world. It sort of forms a foundation for me of my life and I feel that it’s absolutely a crucial part of my life in order for me to be relatively happy in the world and sort of nourished and replenished.”

Sometimes escape and healing was obtained through participating in the respondent’s preferred activity in this case which was camping and hiking:

**(Maria)** “Hiking though seems like such an open word. It means so many different things to different people. And part of it is camping. I mean I love camping so camping is good, part of it is, you know, looking at the plants and the animals, part of it is leaving so much behind, not just the physical things but you know the mental things of life as well. So hiking for me is a word that carries a great deal of meaning.”

For another respondent, the *worry-free* quality of Willmore was emphasized:

**(Ricky)** “No worries, yeah, I mean when you’re up there you don’t think about what’s going on in town or whatever because everything you do is just you know about really living comfortable while you’re up there so you’re not worried about what’s going on at home because there’s no newspapers to worry about, no news, no bad news because you can’t talk to nobody so it’s all good (laugh). Actually it’s a shame a lot of times when you’ve got to come back. Once you get up there everything’s comfortable, why go home, eh?”

For two female respondents, the challenge associated with their Willmore trips was stepping *outside the box* for them. Although they felt like they were out of their comfort zone at times, they felt fulfilled as a result of their wilderness experience:

**(Mona)** “With being out in the wilderness like it just expands your whole purpose (emphasize) you know because it’s something you would not experience at home - not to that level. I think it would be great for anybody to go there, just for a, what would you call that, experience?”

Kaplan and Kaplan (1989) suggested that aesthetic natural environments can be restorative in the sense that they restore people’s ability for directed attention through reduction of mental fatigue. Often people are suffering from work pressures or tasks that leave them unable to focus and concentrate. According to Kaplan and Kaplan, directed attention becomes fatigued because it is called on repeatedly in order to avoid the distractions of more appealing stimuli. An individual who is mentally fatigued may be more prone to human error, more irritable, and being “rash, uncooperative, and far less competent” (Kaplan & Kaplan, 1989, p. 181). From this perspective, people may find Willmore replenishes them: they are able to return back to their everyday life with a refreshed arsenal of directed attention. Kaplan and Kaplan (1989) identified four main contributions that a restorative experience contributes to the replenishment of mental effectiveness: (1) dissolving clutter from one’s mind, (2) allowing directed attention to recover, (3) “cognitive quiet fostered by soft fascination” (p. 197), and (4) “reflections on one’s life, on one’s priorities and possibilities, on one’s actions and one’s goals” (p. 197). It was not surprising that escape and restoration emerged a theme for Willmore. It had been identified as a theme or dimension in many studies of place meanings within a variety of natural area settings. For example, Wynveen et al. (2010) found escape from the everyday was one of the most common meanings ascribed to the Great Barrier Reef Marine Park. However, in their study, solitude was an essential component to the theme escape from the everyday whereas in this study, though related did not appear to be essential. Smaldone et al. (2008) combined escape, peaceful, and solitude for their escape meanings code and escape was also double-coded within other meanings themes. Davenport and Anderson (2005) identified escape of as a component of the tonic dimension (i.e., beneficial to the mind, body, and soul) of their *web of river meanings*. Escape was inter-related with other sub-dimensions such as freedom, solitude, share with others, and access. This was similar to Willmore, where escape and restoration was inter-related to many of

the other meanings themes such as aesthetic, spiritual, unique physical landscape, activity, solitude, and undeveloped and intactness.

#### 4.2.2.10 Undeveloped and Intactness

Many respondents described Willmore using terms that could be used to describe wilderness such as *wild, undeveloped, pristine, raw, relatively unscathed, untouched, and unspoiled*. One respondent described Willmore as being *whole, w-h-o-l-e*. Many described the park as having a nearly intact ecosystem with *little disturbance to the natural environment*:

**(Craig)** “Well it definitely feels like wilderness simply because of the absence of human, the human footprint on the landscape. I mean there are some major roads in there that were made back in the 20s and 30s that have sort of overgrown and they’re there and they are a scar on the landscape and there are other things like some of the main camps down in the bottom of the valleys but you can travel you know a few hundred meters away from those and feel that you are truly in country that perhaps no-one else has ever been. You know the wildlife is there. The ecosystem is intact as much as intact as it can be anywhere nowadays you know. It’s unimpacted by humans and that’s the way I view wilderness as unaffected by human activity.”

Participants’ descriptions of wilderness were interwoven within this theme. Some respondents felt that Willmore was a near wilderness as perfect wilderness did not exist. One respondent when describing if Willmore felt like wilderness asserted that “wilderness is such a slippery word” and that Willmore was a *near wilderness* while another thought it was *pretty darn close* to being wilderness. Other felt Willmore was considered *unspoiled wilderness in most places* with the exception of some areas of the park:

**(Maria)** “I worked for Parks Canada for a while and struggled with this word but I’m going to say yes in terms of wilderness, not true wilderness, but sort of near wilderness. That’s because it feels relatively untouched by human activity and there are so few people there and so few obvious restrictions.”

**(Scott)** “I would define it by the fewest disturbances in terms of you know man-made structures or whatever and with an ecosystem that’s generally intact and relatively speaking Willmore is quite untouched and relatively intact not perfect but nowhere is but it’s pretty darn close.”

**(Frank)** “True wilderness is like at Casket Lake. Could exclude Rock Lake and Eagles Nest.”

While describing if they considered Willmore as wilderness, some respondents considered Willmore as being classified as wilderness under their personal definitions of wilderness:

**(Ana)** “Well in my definition of wilderness there is no permanent human habitation and very little disturbance to the natural environment.”

**(Margaret)** “Yes it’s a preserved area: no roads, no settlements, no development nor facilities – except for a few horse trails and primitive camps. Little information about this park somewhat confidential, so few people – we saw riders near Eagles Nest Camp – that’s all.”

A similar finding related to user definitions of wilderness was found by Wray (2009).

Participants in Wray’s study had used similar terms to describe the wilderness of Fiordlands National Park, New Zealand. Wray had assimilated his respondents’ key features of wilderness under the place meanings theme of experiencing nature on nature’s terms. There was no commonly agreed upon definition of wilderness and according to Dudley, Kormos, Locke, and Martin (2012): the term wilderness is two-dimensional, including both biological and social components. They also defined a wilderness protected area as “an area that is mainly biologically intact, is free of modern, industrial infrastructure, and has been set aside so that humans may continue to have a relationship with wild nature” (p. 9). It was identified by in-depth survey respondents in chapter four of this study, that the number one motivation for visiting Willmore was to enjoy the experience of wilderness ( $n = 87$ ,  $M = 4.77$ ). Clearly, visitors to Willmore value the wilderness experience that Willmore offered and the meanings associated with wilderness.

The size of Willmore was identified as being important to some respondents especially related to ecological integrity and ecosystem functioning:

**(Luke)** “The size I think is very important, you know to have integrity of ecological systems you need a big area and Willmore provides that.”

Some respondents thought it was good that Willmore existed in an area of other protected areas:

**(Margaret)** “That’s why a park like Willmore is so important to us European visitors. In Western Canada you still have remote and preserved areas, with quite healthy wildlife populations - and Willmore is one of these areas. When we hiked to Willmore Wilderness Park; last year we were glad to know that more north there is Kakwa Wildland Park and Kakwa Provincial Park and more south the huge system of provincial and national parks along the Continental Divide (Banff, Yoho, etc.): in total, a huge intact, ecologically healthy mountain ecosystem! And that’s why we agree with Yellowstone to Yukon Conservation initiative (Y2Y), a great opportunity to preserve this huge mountain ecosystem for both human and wildlife communities from Wyoming to the Yukon.”

**(Patricia)** “Between BC and Alberta having the national parks and the Willmore Wilderness and the provincial parks all kind of joining onto each other. I think that’s

good because it makes it even a larger wilderness core and then when you're in there you can really experience what wilderness is."

**(Maria)** "It backs onto a national park and so it is itself part of a whole larger protected area."

"It's one thing stressed in ecosystems you need large areas and you need to connect them, one to another."

The fairly undeveloped aspect of Willmore also seemed to transport some of the visitors *back in time*. With little visual evidence of human artifacts besides trails, campsites, and cabins, Willmore seemed to exhibit many wilderness qualities as those defined in the U.S. Wilderness Act, such as primitive recreation. The term *primitive* represents a self-reliance of one's skills and having the dimensions of simplicity and lack of technology (Johnson et al., 2005). Roggenbuck (2004) described primitive experiences as representing "immediate and deep contact with raw nature without the clutter and aid of modern conveniences" (p. 22) and mentioned the definition of modern is value related. Evidently, what is considered primitive today would differ from historic times where primitive was essentially a way of life. For example, the following participants described how being in Willmore was similar to going back to an earlier time:

**(Ricky)** "Well I tell a lot of foreigners, you know, it's just like going back as far as time you can go in because you know everything is horse transportation or walking and there's no motor vehicles, nobody's going to pass you in a motorized vehicle and there's not buildings up all over like in Europe. A lot of places everywhere you go is like people and gravel trails and I just tell them it's about as wild as you can go back in time, I mean it is really."

"I've been to Northern BC years ago and that was real wilderness and miles and miles of timber with no roads. When you've got no roads that's about as close as you can come to wilderness because everything else has a road going through it or you know you've got these big parks in the states and they call them wilderness areas but they've got hiking trails all over, graveled, it's not, here everything's kind of natural the way it, the watershed and everything and the horse trails and Willmore is no different than it was in 1900 really except for the signs."

**(Leroy)** "The fact that there is no motorized vehicles around and it is kind of like it was you know, maybe a little more bushy now then it was 100 years ago but it's basically the same."

Schroeder (2002) identified naturalness as a significant meaning that survey participants identified with their special places. Similar to Willmore, Schroeder's participants valued the



primitive and pristine characteristics of their special places. The aspects of challenge, self-reliance and self-sufficiency were also related to the primitive character of Willmore. These were important aspects noted by interview participants. It appealed to participants that Willmore did not have conveniences such as bridged water crossings and marked and signed trails:

**(Corey)** “I think it’s incredibly important that as a province and a country we preserve natural areas that are not destroyed by development and having said that I enjoy development, but I think you need some of those areas that are habitat for the wildlife and just exist the way they are and allow some people to access them in a more, I don’t want to say a higher risk, I’m not a high risk adventurer but in a more self-reliant manner, that you don’t have everything there at your disposal. I think that’s, you/some people need that challenge and those areas need to exist but some of it just needs to exist to make sure that we can maintain some of our cultural heritage or our wildlife heritage.”

The presence of modern amenities such as signage, patrol or trappers cabins, and motorized access (e.g., OHVs) for certain users, evidently frustrated some participants. It appeared that the use of modern conveniences by some users, detracted from the wilderness qualities for others. These users experienced the visual and auditory effects of modern conveniences. This degraded their trip experience through the alteration of wilderness aesthetics (e.g., the sight and sound of a helicopter in the wilderness, OHV sightings, sounds, and tracks, unsightly aesthetics of private trapper’s cabins). They may have felt these were activities or infrastructure that was inconsistent with the ideal of a protected wilderness park:

**(Ricky)** “Years ago it really pissed me off when they signed all the trails. Yeah people don’t know Willmore but they do have maps and valleys, like there’s big flat country, like you look at your map and it shows a valley and it shows Sheep Creek you should figure it, if you don’t, maybe you shouldn’t be there, laugh, well if you don’t know where you’re going, outfitters years ago didn’t have signs and all that and they went up there and when you start signing everything it starts taking away from really what nature looks like. You go to Jasper, everything is “signed out.” This many kilometers, this many kilometers, I mean it’s not really back in the bush, everything is a road map.”  
“I don’t believe the trappers should be able to go up there until the tourist season is done and if it’s going to leave tracks it shouldn’t be allowed. I mean I trap and I know the guys but I just don’t believe in like I’m partners with a guy here in a trapline and I won’t go up there and leave traps in October with the quad if I can go up there because to me it takes away from the wilderness after you tell a bunch of people it’s a wilderness area and there’s a set of quad tracks going up, great. They don’t disappear right away, like it depends on the season, if it rains lots then it disappears but if it’s wet and it dries, you see those quad tracks just about all summer unless there is a lot of horse traffic on them. I can see at Eagles Nest from these guys going in at that time of year with no snow. When you

cross the river going to Eagles Nest they've got a quad trail there now. Like you keep using the same place, you find a quad trail, it's not, I really disagree with that."

"The only thing I don't like that they done last year is Parks put a whole bunch more cabins up there. Now you're starting to make it look like any other place. Why do they need all those, I mean if you're a patroller and you're a horse person in those parks you'd have to put up some tents too. I mean they're no different than you and I and why do we need all these cabins now, they've got cabins up all over, more cabins, I don't know what they need all those cabins for. Now it's started to make it look dotted with buildings all over and next they'll want to put a shed up beside their thing because they'll want this and they'll want that. You know you'll go to the first cabin at Eagles Nest, first one when you get up here, the cabin and they've got fence posts in the ground now so you can put wire around. I mean they'll want to go and get their horses in the morning so I don't agree with what Parks is doing, how they're regulating it because you know when it was forestry and that that run it they didn't, they'd hire an outfitter and take them on patrol or something and now these guys they've got the budget I guess, they fly their supplies in with helicopters. Since Parks took over I think it's gone downhill really and it probably will go downhill because wardens or whatever they've got patrolling it want this and want that and..."

**(Corey)** "That mess up to Rock Creek and whatnot and all those big trails that are eroded and washed out are from the exploration development in the '50s and it's still there. Those scars last forever and you don't get over those in anybody's lifetime and so you've got to be really cautious about how much development you go on and that's the kind of stuff I hate to see in Willmore, well we've got to get a better road or put a fire road, you know, I cringe a little bit when I see Park's new cabin out at Blue Grouse. I mean that shouldn't have been done. That's a, that doesn't cut it, that's a personal benefit for a few people that have some control over the parks. They don't need that cabin there. It's a beautiful cabin. It's very well built. Whoever did it is an artist. I think I met him somewhere and talked to the guy but first I was sitting in Blue Grouse, I was sitting on a stump having lunch and looking thinking what the heck is that, crap, that's a condo, now who's going to get in there. The only way you can get in there is with a helicopter. You can't even ride a horse to it. Well who's benefiting from that and that's just one more stroke off the park."

**(Luke)** "If there was to be any change at all to the present status, I think I would like to see more restrictions placed on the so-called, the leasers of the traplines, right. I think that they are abusing their privileges at least the ones at the cabin that I visited and I think they should have more accountability because that's an enormous privilege that they have and I think responsibility should come along with that. They should be stewards of the place not taking advantage of it."

As mentioned within the freedom theme, certain activities that occur in wilderness can threaten and alter wilderness values. Hendee and Dawson (2001) identified that inholdings of private or public lands within wilderness can threaten wilderness values as these can act as private retreats

for those able to access these holdings. In Willmore, some private cabins are elaborate and provide the leasers or inholders prime access to wilderness. This may detract from the wilderness experience and the ideal of primitiveness for others. The presence and number of Alberta Parks' cabins (though they can be important for park staff) appeared to negatively affect the wilderness meanings for others. One respondent became highly attached to the Eagles Nest Cabin while it was open to the public. Her place meanings were altered when the cabin was closed to the public for a period of time.

Place meanings associated with aspects of undeveloped, natural, or undisturbed were found in other studies. In the Bitterroot National Forest study participants identified natural-roadless as one of the main meanings associated with special places (Gunderson & Watson, 2007). This theme encompassed the natural features of wild places and the lack of human footprint on the landscape (e.g., road access etc.). Davenport and Anderson's (2005) identified through their *web of river meanings*, nature as one main dimension which included a sub-dimension of undisturbed. Participant comments related to low development and access along with abundant biodiversity of the river environs. It was found that within a marine environment that a lack of built infrastructure/pristine environment was an emergent meaning (Wynveen et al., 2010). Smaldone et al. (2008) identified undeveloped or natural as a place meanings code in their study of time in developing place meanings in Wyoming. Similar words and phrases that emerged for Willmore related to this theme were referred to by their study participants such as undeveloped, natural, and wild.

#### **4.2.2.11 Park Management**

This emergent theme related to thoughts, feelings, beliefs, perceptions, and attitudes related to the management of Willmore. The literature review section of this thesis described how an understanding of the significance of place meanings can inform decision-making and feed into parks management. Effective management can also enhance stakeholder support and commitment, which can lead to more effective collaboration and effective partnerships (Davenport et al., 2010). As described through the various themes within this study, participants mainly had *no-worries when in Willmore, but were worried about Willmore*. It was interesting to note that there were commonalities that emerged within this theme among the different users (e.g., horse users and hikers) as well as divergences. Many participants passionately expressed

their concern for Willmore. Some were evidently frustrated with certain aspects of Willmore management or what they appeared to perceive as passive park management. There appeared to be low or moderate trust towards park managers and past decisions that were made related to the park. Similar to Gunderson and Watson (2007) where they found that public was skeptical and fearful of hidden agendas associated with hazardous fuel management, some respondents appeared skeptical of the understanding of managers about the park. Participants appreciated the opportunity to discuss their meanings and it appeared there had been no previous attempts to gauge stakeholder meanings prior to the interviews. Park managers were generally viewed as having a lack of understanding, being non-proactive, and uninformed. As revealed by the previously discussed meanings themes, participants were strongly attached to Willmore and tied to this attachment were opinions and beliefs about Willmore. This theme was sub-divided into three sub-themes that emerged from respondent discussions: balance, planning, and preservation or protection.

#### **4.2.2.11.1 Balance**

Participants expressed through a variety of examples the need for balance in Willmore. This included a balance in visitation, research activities, promotion of Willmore, stakeholder inclusion and participation and their meanings of place. For example, some participants struggled with regulation versus freedom while another was challenged with how Willmore could be promoted to more people, but in a manner that didn't alter its present character and meanings resulting from too many people using the park:

**(Corey)** "I want to say there's a freedom but nothing annoys me worse than people that abuse the place and throw garbage around and cut down trees they don't need to or cut a trail where they don't need to or let their horses damage trees. That ruins it because you ruin the environment and shows the overuse and you need some regulation and control to manage that and that's the balance is how do you get, how do you allow people to still come in in a totally uncontrolled manner quote or unquote manner and yet maintain the pristine nature of the wilderness. How do you maintain wilderness and give people access to wilderness and still have wilderness?"

**(Patricia)** "I think it should stay the way it is, large and unscarred I guess, laugh, just for the animals to live in and yeah visitors should be allowed but if it ever got to the point where there was, that it was going to change the face of the park then the number of visitors should be limited, like right now I think it's probably quite okay but well then there always seems to be areas that are heavily visited and then others aren't."

**(Ricky)** “Many people in Alberta do not even know about Willmore. They’ve lived there all their life and its right next door. Some fellow in Germany knows it better than the guy who’s lived here all their life and Parks they don’t promote it. I guess in some ways it’s good and some ways it’s bad.”

There were conflicting meanings related to scientific research within the park. Some respondents thought there should be more research, while another thought there should be less:

**(Kimberly)** “I like the idea that you’re doing a survey that you’re asking questions because I think that means you’re gathering data from people who use the park so people have access to what people are doing in the park and what they want. So I think that’s what can be done and should be done and it’s something that probably ought to be done regularly. Who’s out there? Who’s using it? What are some of their needs?”

**(Christopher)** “Well I think they need legitimate studies of species such as goats, moose, and caribou and an advisory group composed of mixed interests. Evidence elsewhere shows for example that goats don’t re-establish easily.”

**(Craig)** “It’s the research activities that take place in Willmore. It seems like there isn’t anything that walks or crawls or grows out of the ground that isn’t being studied you know from caribou, grizzly bears, moose, you know pine beetle, like Whitebark Pine, everything I can imagine is being studied, Harlequin ducks, you know the list goes on and on and it does detract from the visitor’s experience if they want a wilderness experience and you’re out there hiking on a ridge and you’re thinking geez, I feel like no human has ever been here before and then you run into some little research cairn or box or camera or whatever it happens to be and that’s only the small part of it, to me I think sometimes we’re studying you know animals to their death or to their own and detriment perhaps and I made the comment one time, it wasn’t really well received but it’s the way I feel, is when the last you know grizzly bear or caribou is dead because we’ve over-studied it, what good is all the research and the studying that we’ve done. I mean you can write books about how great the caribou used to be and what they were like but once they’re gone it doesn’t matter in my opinion, if you’ve killed them off one way or the other than I think we’ve done ourselves and nature a disservice so that’s my soapbox and I’ll leave it at that.”

The theme of balance was also apparent with relation to stakeholder inclusion in management planning and decision-making. Many respondents described a lack of stakeholder consultation, inclusion and opportunities for participation and wished to see an improved balance. Those who had participated in past stakeholder meetings or consultations felt their input was ignored or not taken into consideration. For example, one respondent described his vision of balanced management:

**(Charlie)** “I guess my perfect world would be to have some of the management of those places put into, take it out of the government’s hands. Put it into a management group

who are made up of scientific people and people who use it on a regular basis whether it be trappers, outfitters, private people, horse users, hikers and you know there have been private horse users going to Willmore for as long as I have and they love the place, that's why they go there so and if you talk to any of them they will tell you exactly the same thing that I did so I think some of these things need to be done with the support of government because it ain't going to happen unless they rubber stamp it but I think they need to lose, what am I looking for, they shouldn't have all the say in whether things happen or not. It should be managed somehow by some of the users and have them be able to say yes or no on some of these issues because ultimately the people who are out there a lot have a lot better perception of what's going on than our minister who probably has never been there."

Balance was also described as the need to have representative stakeholder input into park decisions and operations. One respondent felt that a special interest group out voiced other Willmore stakeholders. Another respondent suggested the formation of a group similar to a *friends of* group where positive collaboration with Alberta Parks could potentially develop:

**(Christopher)** "We've got an interest group that has one particular kind of interest which is basically hunting and they're very organized and others don't necessarily have a voice as they are not organized. For example, if some outfitters are in a different kind of mindset about Willmore from the interest group, those people aren't represented"

**(Craig)** "It would be good if there was a *friends of* group or something like it, I mean the Foundation masquerades as some sort of a benefit to Willmore which is not the case at all in my mind. It simply is an impediment to any sort of positive progress or positive relationship with Alberta Parks but if there was a group or if that group could get redirected and actually pull in the traces with Alberta Parks to influence, to get some funds, get some staff, and actually do something positive instead of just nitpicking and complaining about government while government continues to give them free funding for a number of different initiatives."

Part of the balance as one participant described, was having the opportunity to contribute. She was willing to invest in the park to maintain its present meanings, as well as helping to insuring its future longevity:

**(Sandra)** "I would hate to see us lose access to that and have a lot of restrictions put on it and become really commercial. I think the commercial aspect of it is that it is wilderness and it would be nice to see it kept that way. I guess I've always tried to leave my phone number or our phone numbers for the park rangers and let us know, give us a call if you're having any problems getting things hooked up like the water trough because the pipes are frozen or broken or don't have equipment to clean the stalls, I mean call us, we'll come down, we'll bring some Bobcats and a group of people like we're willing to invest in it, make sure you call us, but nothing ever seems to come out of that. You know

because we don't want to lose it and like I said that's probably why we're committed to and give you the info. because it's a real gem."

In addition to having opportunities for stakeholder or volunteer participation, was learning how to contribute. Sandra commented on not knowing where to learn how she could help the Park:

**(Sandra)** "You know when you sent me that one big survey and there's some questions on there like you're asking me different things about trees and plants and you're asking different things about you know commercial uses like oil companies or... and I really didn't know the answer to that and I don't know where to look for the answers to that like to get more information to even be more proactive is not readily available and I have to go looking for it."

In addition, Sandra described how she felt it was the government's responsibility to protect Willmore, but was keen on learning what she could do to help protect the park:

**(Sandra)** "I would pick it up if there was a brochure talking about you know here are ten basic things you can do to help us protect the park. I sort of feel the government is paid to look after it, they're the specialists, maybe there's something that I'm forgetting to do that I could do right, I don't know."

#### **4.2.2.11.2 Planning and Management**

Similar to many other protected areas, Willmore has park issues and challenges that it faces both internally and externally. Park challenges that were mentioned by participants included: wildlife or species of concern, external pressures on the park (e.g., industrial or resource extraction activity, fragmentation by roads, illegal OHV use), invasive weeds, litter, fire management (i.e., prescribed burns and wildfire), overgrazing by stock (e.g., horses), inappropriate activities (i.e., contested meanings of hunting or trapping, helicopter use), implementation and presence of infrastructure (e.g., backcountry cabins), and concerns related to campsite conditions (pit-toilets, lack of firewood, improper tying of horses):

**(Ricky)** "I have a big issue with people how they treat the camps. I don't like, I don't mind people tying horses to trees but a lot of these guys go up there and they're scared to turn their horses loose so they tie a horse to a tree all night and what the horse will do is they'll paw so now you've got a big hole there and eventually a tree will die because they've disturbed all the roots and the horses shit up the camp and you don't, over the years I've had my guests help me clean up manure, nobody wants to sleep in a barn yard. You pull in a camp and there's a nice grass spot there but they only have one tent so they set it up there and the other grass part well I'll tie my horse there, well you're limited to ten spots up there and then if you've got the horses pawing them up and a lot of those guys they just don't know better. They don't realize people are going to be coming to that

camp for the next 20 years and you've tied your horse there and he paws all night because they're scared to turn their horses loose you know. Well most of them would run away, laugh (laugh)."

Participants expressed their desire for pro-active planning and management for Willmore.

Though many participants desired for Willmore to remain as it is, there was agreement between both horse and hikers that fire was an important, natural, and historic component of the Willmore ecosystem. Many respondents felt that wildlife and fire were inter-related in a positive relationship and that fire was important to reintroduce or allow to burn within the Willmore landscape:

**(Anthony)** "The only thing that you know thinking about the Willmore that probably should have changed is and years gone by if a fire ever started there was always somebody out there to put it out, but you think back 100 years ago, a lot of that country was open, it was all burnt off and now those valleys are getting so grown in that you can go to certain places there in Willmore where there's big meadows that are turning into willow flats and they used to be big meadows, well that affects wildlife and it definitely affects people when they go in there with horses because it's harder, horses have a hard time getting around those willows with hobbles on. It does impact the wildlife and to have a natural ecosystem I think you have to have fires going once in awhile and it reinvigorates the landscape and get new growth coming and you'll see a change in wildlife even that use it because the meadows went through a stage where they had young willows and you see a lot of moose in them and then the willows get old and woody and the moose don't eat them anymore and they get big and the only thing that will get rid of them now is a fire to go through it and you just don't see the fires that you probably saw 100 years ago that kept the valleys clean and it does impact the habitat for the animals that are out there. I've worked in places in B.C. where they did burn it and it's a world of difference. I worked up there where I've burned valleys off and the game was way more plentiful in those valleys than it is out here and I think it's just because of the way the landscape is managed. You don't have the fires go through there and burn it off."

**(Leroy)** "You know when you're reading there about some of them places you know like not that long ago they, you know, they said from one camp you could see 50 moose or something you know and I don't know how far you have to ride now to see 50 moose but I think it is because the natives used to keep the valleys burnt off you know. More food, the elk have completely left there it seems like you know and I hear they are trying to do a few controlled burns now. I know the reason there but I think they should step up their activity and do that and maybe get them instead of turning elk loose in Saskatchewan and maybe try to re-establish them back in there and stuff and you know do things like, I mean a lot of people complain and I know a guy here that's in Bonnyville not far from my place and he used to go in there 15-20 years ago and he said there was grass everywhere and anywhere you wanted to camp and some places now there is so much of that re-growth that there is not much grass for the horses around these camps where he



used to camp at. So the brush is definitely getting, it's getting shoulder height when you're riding your horse now, when you're down in some of them valleys."

**(Maria)** "The maintenance of grass in the valleys actually requires human intervention now because of years and years and years of fire suppression with no fires the willows are filling up the valleys and the horses can't get feed anymore. That's simplifying things but that seems to be the chain of analysis and so if like me you need some kind of horse support in order to access it and the horses can't have anything to eat then we're in a problem aren't we?"

**(Christopher)** "For horse and wildlife habitat they've got to do some willow burning. There are a number of trails I could talk about where it's really unpleasant to hike because the willows are over your head for as much as two miles and that means you're down in and I started feeling insecure. You know one of the nice things about Willmore is many of the places that you are you've got good visibility so you can have an idea whether you're going to run into a grizzly and spook it which you don't want to do of course because they tend not to run away sometimes but I think that habitat problem is very serious."

**(Charlie)** "I mean having spent quite a bit of time out there you can see things that have happened and I guess it really needs some support through our government agencies to maintain what's there and some of the wildlife needs some help and it needs to be better managed in terms of burns and some type of management to keep it in a usable state so that people can use it. It's growing up so bad just like Jasper is and other places that if they leave it much longer you'll see the hikers will start to drop off because they can't fight their way through willows and the horses will drop off because there is no horse feed and it will end up like Jasper just another big, large, expansive, mountainous country that nobody wants to be in."

"When you know that previous burns have been negated (pause) because of people who had some power but they didn't have any knowledge and so you really wonder when they are going to get somebody to realize what's actually going on and to have the wear-with-all to actually put some of these things in action. All the government boys like to keep both hands over their ass so nothing bad can happen to them but you know at some point in time if they want to maintain that place somebody's going to have to step up and do something."

These comments were similar to findings from the Bitterroot National Forest, Montana. It was found that a majority of study participants supported a natural fire regime either through the allowance of naturally ignited fires (i.e., lightning) or prescribed burns (i.e., fires ignited by trained personnel) (Turbeville, 2006). The support for a natural fire regime was related to participants' place meaning that they ascribed to the natural environment. This study also noted that the consideration of place meanings was important for managers to learn when planning and

prescribing programs or plans that would alter the physical characteristics of an area (Turbeville, 2006).

It was evident from these and other respondent excerpts that this sub-theme generated much discussion and provided much insight into participant meanings related to park planning and management. According to Yung et al. (2003) place meanings such as this are important to learn as they can alert both participants and managers areas of dissatisfaction, brewing conflict, and policies that might address multiple policy needs.

#### **4.2.2.11.3 Preservation and Protection**

This theme encompassed respondents' desire for the protection and preservation of Willmore. Many respondents wanted to see Willmore remain and retain its current character and qualities. This included thoughts about the size of the park and it was common for participants to assert *leave Willmore alone*. Other respondents hoped that Willmore *stayed the same*:

**(Ricky)** "It's a wonderful place. I mean if they keep regulating it, it is going to change (emphasize) and you know and I know it's going to sooner or later, it would be nice if it kind of stayed the same, eh?"

"They keep making new rules and pretty soon like I said more rules, less people will go there, it's like they're trying to push people away from going there. Like I mean you've got this tract of land and all of a sudden they regulate and regulate so nobody wants to go there and then if it's there what's there for people to enjoy if you can't go there and there's so many rules."

**(Ana)** "Quite honestly the reason I am participating in this interview is the hope (emphasize), the human failing of hope that something can be done to make Parks leave the Willmore alone. It's not just their cabins and their new roads and the helicopter issue which is so blatant, it's their whole idea that they can manage wilderness. It's just such a foreign concept or the arrogance that humans can manage nature in the first place is yeah, it's just arrogant. Whether it's burning or allowing helicopter logging, yeah, it's kind of silly, it's more than silly, it's detrimental."

**(Anthony)** "I think it's an unknown jewel. There's so many people that don't know about it, you know we talk about it, but I think the reason it's such a jewel is maybe because so many people can't go in there. You know and if it was ever opened up it would wreck it. You know, anybody can go in there but there's three ways you can go in there and that's on horse or foot or bike and if that stays, it'll remain the way it is. If they change that in any fashion it wouldn't be good for the park."

**(Leroy)** “They’ve got enough areas they can develop, they don’t need to be going and pushing like that I think, and I mean there’s some places that should be left alone and I think Willmore is one of them.”

**(Margaret)** “Keep Willmore Wilderness Park, wild! There are so many other places and parks in the Rockies to find facilities such as designated campsites, bridges, etc. for people who need more security and/or amenities. National Parks are great places for that. Willmore should stay a *wilderness park*.”

**(Corey)** “I think Willmore needs to be one of those areas where we say no. It’s a park and we’re not going to develop it.”

Other respondents wanted to see Willmore remain its current size and not be reduced in size as it had experienced in the past:

**(Corey):** “We should go into armed rebellion if they do decide to put the boundaries back any smaller. I mean they chopped a big enough chunk off the park as it was.”

Similarly another respondent wanted the physical size of Willmore to remain the same and not become fragmented:

**(Patricia)** “I think that it would just be to like not change the borders. Like I’m thinking of like when governments go well we’ll trade this piece of land for this piece of land and so you still have the same amount of area right but that’s not the same because it starts getting fragmented so here you have a little pocket here and a little pocket here but there’s no continuity so if the borders just stay where they are, like it’s this one big track of land.”

The same respondent later described the Gila Wilderness in New Mexico and how it paralleled the legacy potential of Willmore:

**(Patricia)** “It just covers like a million acres like it’s huge (it’s a huge channel) and it’s accessible by horses or hiking or you can kayak the rivers or canoe the rivers, no motorized use at all and “It just feels like you could drive for two weeks without crossing the road through the wilderness. The same with Willmore. It’s an amazing legacy that they have there so I think that Willmore could be the same especially in conjunction with Banff and Jasper and Mount Robson and Assiniboine and Yoho, Kootenay and Kakwa and all the other parks you know that are all adjoining to each other, like I think it’s very, very, important to keep that area intact, laugh.”

The value of Willmore as a wilderness backdrop for the future education coming generations was suggested by another respondent:

**(Corey)** “Maybe that’s part of the whole value of Willmore is the societal the global good is the fact that there is a need to educate young people, younger people about those

kind of values. You know the values that wilderness exists because it exists and it's our planet you know I mean I'm not a tree hugger by any means because I shot pretty well anything that walks or crawls you know but I do it with appreciation and reverence for it and so maybe that's part of the value too is it's sort of the, you know people joke about the church of the Rocky Mountains but that's what it's there for and can we teach the next generation about why this is really important to be there and to respect it."

Another respondent described Willmore as being *vulnerable* and when probed to describe why he chose this word stated:

**(Scott)** "As a long term resident I'm aware maybe of something that a lot of people who live here aren't aware and that is we are living on land that was Willmore and so there have been a couple of pieces hacked off of it so far and you know I think pressure is only going to increase for the resources and for development of all kinds, roadways, I know in this community a lot of talk has been had in the past about putting a roadway through to McBride so there's the fragmentation part of it so you know as it stands I know it's got its own act and you know people tend to think it's very well protected. I'm not so sure, I'm not convinced."

"I really do understand the concerns of the outfitters and the people who are using Willmore for traditional uses. I understand but I think they have to put Willmore the place before Willmore the provider of their experiences, okay, so again it goes back hand in hand with what I said about you know the Willmore Act and so on and so forth. I really don't think that under provincial control, exclusively over the long-term I don't think it's going to survive as is, so I understand they want to be able to continue their traditional uses and for the short term, leaving it as is, is probably the best answer for them, it's probably going to get them through their lifetimes but I don't know how much farther beyond that and so you know if it did become a World Heritage site at some point it would I think spark more studies like this one, a lot more interest, a lot more visitation, although I don't like, I don't want to see people crawling all over it. I think at some point in the future it will need that public support and if nobody has heard of it, as is presently the case, nobody is having any interaction with it as presently is the case, the support won't be there when the time comes so I think the only way to guarantee Willmore the place, a place in the future is to go the extra step and get it, basically make it so that it would shame the Alberta Government if they started hacking pieces off of it or fragmenting so that's my thoughts regarding that."

This was contrasted by another respondent who was not supportive of Willmore becoming a World Heritage site:

**(Anthony)** "Last year a motion was put through Parliament to protect the Willmore Act. The Act itself is pretty small. I don't know if you've read it but it's just a couple of sentences and there's a motion put through and it was supported 100% with our Government and that was good to see because it protects the Act (*pause*) and it was pretty important because people were talking about making it a World Heritage Site. There's no need for that (*emphasize*). There is nothing that a World Heritage designation would do

to enhance it and if anything they'd probably cut people off from going in there in places and you don't need that."

When asked what actions people or organizations should take to protect Willmore, one respondent described the following:

**(Craig)** "First and foremost we need to change regulations and I've been harping on that for the last nine years. The political will is not there. We've got groups like the Willmore Foundation that are hampering any progress in the way of getting proper legislation for that park. If you've ever looked at the Willmore Wilderness Park Act, and the (pause) weak regulations that go with the Act under the Forest Act, it makes everything almost unenforceable for officers. It's extremely frustrating (emphasize). At this point, for example, if you had a quad or a snowmobile going in without a permit, the only way to do a proper prosecution on that would be to go through the whole process of laying along information and proceeding to send the individual to court. There's no provisions for seizure, for search, for arrest, there's none of that that exists anywhere in the Willmore Act and simply all it takes under the definition of a Provincial Park really simple in the Parks Acts a Provincial Park is a Wildland Park, a Provincial Park, a Provincial Recreation Area and write it in there, Willmore Wilderness Park, then all those regulations will fall under that, would apply as you wanted it to apply, you could make exceptions if you wanted for this use or that if that was appropriate like maybe trapping or hunting or what have you but that would go a very long way in making it possible for the enforcement officers when they do go in there to actually be able to physically enforce things if they need to and it's getting busier all the time and it does need to be done so that's the first thing."

One respondent commented that Willmore required a management plan while another was not sure if Willmore even had one. In addition, some respondents believed managing Willmore was more about managing people rather than the place. Another strongly believed that wilderness cannot and should not be managed:

**(Maria)** "I don't know what its legal status is but it needs to have some appropriately legal status. I don't know if there is a management plan. I don't even know really what standard one should be using in trying to do a plan or to manage, I was going to say manage a place like Willmore but it's more managing the people that I'm thinking about."

**(Craig)** "We need more staff in Willmore, to actually protect it and look after things. Right now there's not nearly enough people looking at that and we need a good policy and a budget for that park, as well as, a management plan, but everything is under the political thumb and you know as soon as there is a bit of political upheaval like we're waiting on a leadership then we'll be waiting on a cabinet change and then we'll be waiting on something else so you'll be sitting on your hands for a lot of months yet

before they can pull out the workbook and get back at it. You know, it's frustrating, the political process and how long things take to get done, waiting on the political side of it."

**(Ana)** "You cannot manage the wilderness. You can manage use, you can manage people. You can say okay these are the uses, the activities that we are going to allow in the Willmore. We're going to keep within the Willmore Wilderness Act. Okay, if it ever becomes so popular that areas of the Willmore are being detrimentally affected by the huge hordes of people that are going in there then we may have to restrict access, right, that's managing people. Managing wilderness is just; those two terms should never be put together, ever."

The term wilderness management has been noted as a dichotomy of words as Dawson and Hendee (2009) described, "wilderness is conceptualized to be an area where the influence of modern people is absent (or at least minimized), but the word management suggests humans controlling nature." (p. 17). This dichotomy of words can result in people reacting negatively to the term or idea of wilderness management. Dawson and Hendee and pointed out that wilderness management is more about managing the people component along with park pressures in order to preserve the naturalness and solitude aspects of an area (Dawson & Hendee, 2009). This includes area administration (e.g., staffing, enforcement, outreach and education, and rules and regulations, when required). Formal wilderness stewardship plans are essential to managing an area such as Willmore and this will be discussed in more detail in the Chapter Five.

It was not surprising that within the overarching theme of management that sub-dimensions of meanings unique to Willmore have emerged. Willmore has its own unique park stewardship issues and challenges similar to many other protected areas around the world. Other researchers had examined or revealed management related meanings in their studies. Within an urban natural area, meanings associated with the arboretum and society encompassed decisions by management and development (Spartz & Shaw, 2011). McBride (2005) identified the place meanings dimension – management through her visitor study of use and place in the Upper Yellowstone River, Montana. McBride categorized participants based on what they would like to tell management rather than allowing themes to emerge on their own as was done in this study. McBride's management dimension was also multi-dimensional and included four categories of responses: balance, use, planning, and accepting current management practices (McBride, 2005). McBride's category of balance pertained to stakeholder input and considering what was best for the area through balanced ecological and social needs. This was similar to what some Willmore

respondents expressed under the balance theme. Balancing use and user groups was also important in McBride's study which tied into education and enforcement. The planning dimension had parallels to the Willmore planning and management theme as it referred to proactive management planning which was also identified as being important by Willmore participants. Davenport and Anderson (2005) also evaluated their study participants based on their perspectives on river development which they contrasted with their *web of river meanings*. This resulted in a meanings-based framework which could be used to help understand adversarial management issues and challenges.

#### **4.2.2.12 Special Places**

Most respondents when probed if they had a special place, named a specific location or area. In some cases, the entire Willmore ecosystem was considered special. One respondent stressed that the whole context of Willmore was important to her and the ridge that she considered special would not be special without the entire context of the park.

(**Maria**) "I mean it's not just individual spots, it's the whole thing because without the context the individual spots don't count."

"Because you need the whole ecosystem, you need the whole context (okay) and the ridge I spoke about, if you had the ridge without the valleys, you don't have it and if you have the little waterfall without the stream that runs through it and the rock wall that curves around it, you know, it's like having a picture rather than the real thing so the context matters a lot (*emphasize*)."

Other special places mentioned by participants included ridges or mountain tops, alpine lakes, waterfalls, passes, and meadows. Most special places included characteristics that were described as wilderness; however, some respondents considered the Eagles Nest cabin as being special. Other special places were: trails and campsites, gravesites, and historic sites (e.g., the mining community on Thoreau Creek). Wildlife was a common feature of special places, in addition to aesthetic beauty and scenery. Some locations appeared to be special even though the participant had not visited the location. For example, one participant described how they were planning to visit a particular area while they were describing their special places. This coincides with Halpenny (2006) who asserted that first-time visitors may already be forming place attachment to an area. This attachment may result from stories or information from friends and family or media. In this case, the visitor may have heard about the planned location through web-based trip

diaries or stories from friends. In turn, this may have fostered an anticipation of visiting the place, which contributed to an attachment. Gunderson and Watson (2007) found that their study respondents valued new places yet to be explored. Though some special places were experienced while alone, many special places were experienced in the presence of family or friends. Schroeder (2002) had found through his study that people had valued their special places as a backdrop of positive relations with friends, family, and neighbours. Smaldone et al. (2008) found that participants who had longer trip duration, more visits, and a longer association with the area reported a special place. In Willmore, special places were often experienced with friends, family, clients, and group members. In general, varying scales of special places resonated though all of the participants. Many individuals seemed to have developed special attachments to certain locations or to the entire park.

#### **4.2.2.13 Willmore Place Meaning Summary**

This section summarized meanings that participants associated with Willmore Wilderness Park. As described by other researchers, Willmore is a place of rich, varied, inter-linked and complex meanings (Brooks et al., 2007; Bricker & Kerstetter, 2002; Manzo, 2005). It was evident that Willmore held a variety of meanings for commercial and private visitors alike, regardless of the type of user. Interview participants ranged in experience with Willmore from having a few multi-day trips to having been into Willmore on over 1000 occasions. Through this research, it was found that there was an intricate array of emergent themes and many of the themes were strongly correlated to one another to form an intricate web of Willmore meanings (Figure 49). This web is similar to a web of a spider, which is dynamic and complex. This web is ever changing and differs in pattern, spacing, interconnectedness, size, and complexity through the life of its existence. This web differs from individual to individual, similar to the uniqueness of the pattern of each and every spider web. Many of the emergent themes did not exist independently, but instead functioned together to form an integrated and dynamic network of Willmore place meanings. Meanings that users held for Willmore went beyond Willmore as a backdrop for their favourite activity, but encompassed more intangible meanings such as freedom, spirituality, traditional/cultural/historical, and escape/restoration. Willmore was a place of social interaction, memories, experiences, and events. It was evident that participants had a strong attachment towards Wilderness and Willmore in particular as there are not many places



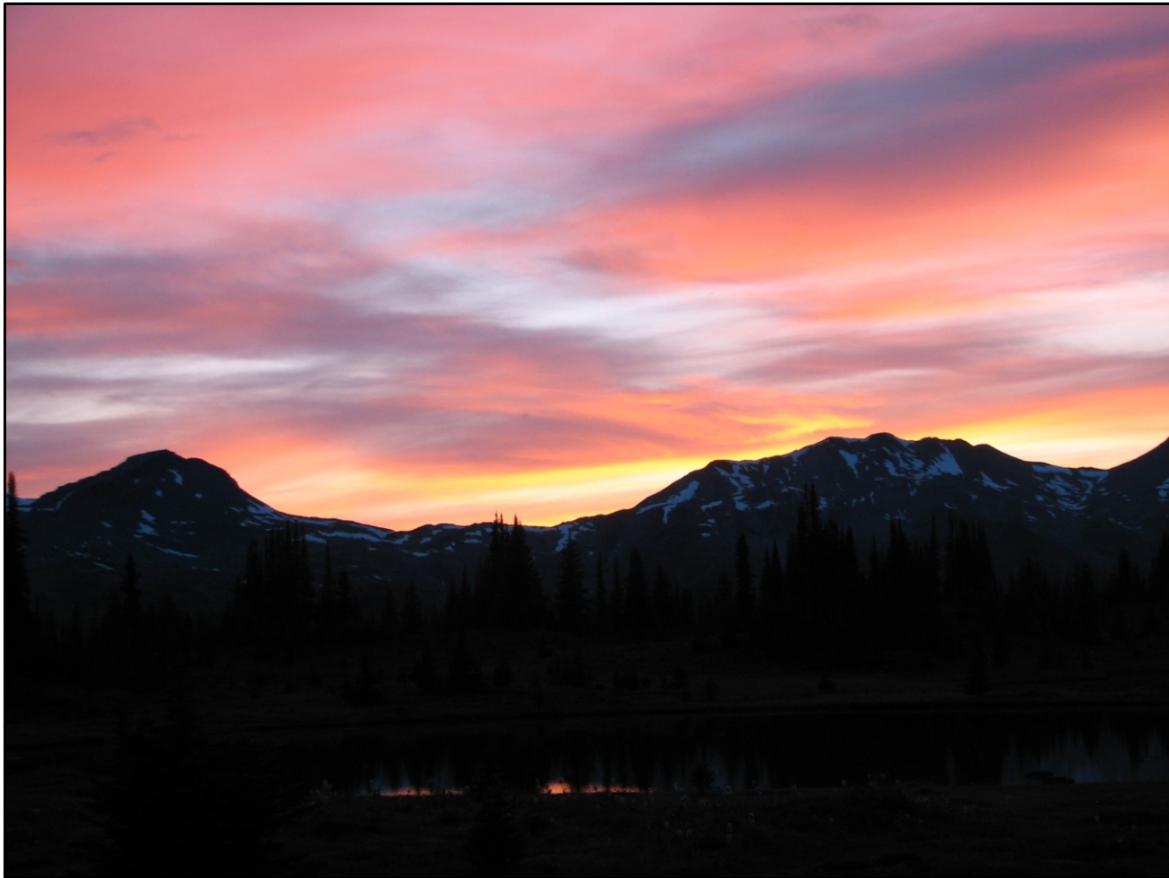
like it in Alberta, indicating that for many, Willmore is not easily or at all substitutable and forms a part of their personal identity.

### Figure 49. Willmore Web of Place Meanings

the growth of willows, increase visibility, and reinvigorate wildlife habitat and wildlife populations. The place meanings described above are also a snapshot in time, and as mentioned previously, these meanings are dynamic and are ever-changing. It will be important for managers to develop innovative and inclusive methods to gauge these meanings through time. It is recommended that place meanings are investigated among different demographics (e.g., teenagers) who visit Willmore as well as traditional users. Though congruencies were found between the meanings that emerged from this study with previous research, it is not surprising that some emergent themes were unique to Willmore and were not commonly found in other studies such as the unique physical landscape. It cannot be assumed that place meanings from past research in other areas are directly transferable to Willmore. Willmore has unique place meanings which will vary between individuals and groups, will vary through time and scale, and will be constantly ever-changing.

## 5.0 RESEARCH SUMMARY, IMPLICATIONS, RECOMMENDATIONS AND SUGGESTED FUTURE RESEARCH

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*“It’s one of the areas in Canada that is representative of wilderness and nature. It’s my hope that sort of thing is retained in places like Willmore, and other parks and protected areas that can sustain that true wilderness” – Craig*

## **5.1 Research Summary**

In this final chapter, the main results of the study are summarized, research implications are discussed, methodological and management recommendations are provided, and future research directions are suggested. The following section will summarize overarching research findings in relation to the main study questions presented in this project.

### **5.1.1 Study Question 1: What is the Visitation Level of Individual Staging Areas in Willmore Wilderness Park?**

The highest visitation to Willmore for the 2010 sampling season occurred at the Sulphur Gates staging area ( $n = 2,444$ ). This was closely followed by Rock Lake ( $n = 2,099$ ). As discussed, visit counts for Sulphur Gates would have been higher; however, due to human camera tampering, a substantial amount of August 2010 data was not collected. Big Berland ( $n = 272$ ) had slightly more visitation than Cowlick Creek ( $n = 223$ ). The highest horse use trailhead was Rock Lake ( $n = 2,211$ ), followed by Sulphur Gates ( $n = 1,753$ ). The number of horses recorded for Sulphur Gates was lower than actual counts due to the missing data. Cowlick Creek ( $n = 466$ ) had more horse use than Big Berland ( $n = 409$ ). The highest number of domestic dogs was recorded at Rock Lake ( $n = 150$ ) followed by Sulphur Gates ( $n = 96$ ). Historically, Rock Lake has consistently been a popular staging area, with overnight trips and horse travel being the most popular trip type and travel mode here. Sulphur Gates has also traditionally been a popular staging area; however, its popularity seems to be increasing. Sulphur Gates had the highest number of day users and hikers, so the increase in its popularity could be due to an increase in day users. Big Berland appears to have been more popular in the early 1980s and its popularity appears to be decreasing over time. Cowlick Creek staging area has not existed as long as the other three staging areas; however, it seems to be the least popular Willmore staging area. It is perhaps more popular with local users, as it appears many other users were not aware of it.

### **5.1.2 Study Question 2: What are the Visitor Characteristics, Motivations, Familiarity (Awareness), Risk Perceptions, and Management Preferences of Willmore Users?**

#### **5.1.2.1 Visitor Characteristics/Motivations**

The Willmore visitor profile developed through this project was contrasted with results from a survey of visitors to Yoho, Kootenay, Banff and Jasper National Parks (Parks Canada, 2003), and the Canadian Travel Market Survey's report on wilderness travelers (Lang Research

Inc., 2007) (Table 37). Willmore attracts mainly an adult demographic. The trail survey indicated a higher proportion of visitors between 50 and 59 years of age. The in-depth survey indicated an average participant age of 46 years. This was a more mature demographic in comparison to the Canadian Travel Market wilderness tourists, where the greatest proportion of those who participated in wilderness activities were between 25 and 44 years and the average age was 37 years. In contrast to the Canadian Travel Market wilderness tourists, Willmore's visitors were less often female. This may be attributed to the Canadian Travel Market study's definition of wilderness and inclusion of contexts that might not be comparable to the type of "wilderness" that Willmore offers. As Parks Canada found in their study of mountain park visitors, this study found that most visitors to Willmore were from Alberta and were repeat visitors. Compared to Parks Canada's mountain park visitors, Willmore travelers appeared to travel in slightly larger groups. In Willmore, visitors mainly travelled with friends and family. Canadian wilderness activity participants were well educated as were Willmore survey respondents. Willmore visitors had higher household incomes than that of Canadian wilderness activity participants, perhaps resulting from the more mature established age demographic present in Willmore. Motivations for visiting Willmore contrasted those of Canadian wilderness activity participants. As discussed in the Results and Discussion Chapter, motivations for visiting Willmore were fairly consistent with motivations for visiting wilderness that were found in previous research (Cordell et al., 2005; Hammit, 2004).

**Table 37. Profile Comparison of Willmore Wilderness, Mountain National Parks, and Canadian Wilderness Visitors**

Attribute	Trail Cameras <sup>a</sup>	Trail Survey <sup>b</sup>	In-Depth Survey <sup>c</sup>	2003 Parks Canada Survey <sup>d</sup>	Canadian Travel Market 2007 <sup>e</sup>
<b>Age</b>	Unknown - 3% Infant - 1% Child - 3% Teenager - 4% Adult - 85% Senior - 4%	9 and under - 2% 10 to 19 - 11% 20 to 29 - 18% 30 to 39 - 15% 40 to 49 - 16% 50 to 59 - 24% 60 and over 13%	Average - 46 years	Not collected	18 to 24 - 21.9% 25 to 34 - 28.5% 35 to 44 - 22.1% 45 to 54 - 17.2% 55 to 64 - 6.3% 65 Plus - 4.10% Ave. age 37.1
<b>Gender</b>	Female - 28% Male - 59% Unknown - 13%	Female - 47% Male - 53%	Female - 38% Male - 62%	Not collected	Female - 49.4% Male - 50.6%
<b>Origin</b>	Not applicable	Canadian - 95% (90% AB & 10% other prov.) U.S.A. - 2% International - 3% Edmonton region - 27% Nearby communities - 18% Other - 56%	Not applicable	Albertan - 45% Canadian - 21% U.S.A. - 21% International - 13%	Atlantic Provinces - 1.2% Quebec - 2.2% Ontario - 2.5% Manitoba - 1.9% Saskatchewan - 1.9% Alberta - 2.1% British Columbia - 3.4% Canada - 2.4%
<b>Ethnicity</b>	Not applicable	Not applicable	Canadian - 93% Other - 7%	Not collected	Not collected
<b>Previous Park Visits</b>	Not applicable	First-time - 39% Repeat - 61%	Not applicable	AB visitors first-time - 3% U.S.A. repeat - 40% International repeat - 33%	Not collected
<b>Park Visits 12 Months</b>	Not applicable	First-time - 56% Repeat - 45%	Not applicable	Not collected	Not collected
<b>Group Type</b>	Group - 97% Solo - 3%	Friends - 46% Family - 32% Spouse/Partner - 32% Solo - 8% Other - 11% Ave. size - 3.8 people	Not applicable	Ave. size - 2.8 people	Not collected
<b>Household Structure</b>	Not applicable	Not applicable	One-person household - 14% Multiple adult household w/out children - 56% Multiple household with children - 29% Other - 1%	Not collected	Not married - 48% Married - 53% No children under 18 - 75% Children under 18 - 25%
<b>Education</b>	Not applicable	Not applicable	Less than high school - 2% College diploma - 20% University graduate degree - 29%  High school graduate - 14% University bachelor degree - 27% Other - 7%	Not collected	High school or less - 29% Some post-secondary - 13% Post-secondary diploma/certificate - 17% University degree - 41%
<b>Occupation</b>	Not applicable	Not applicable	Student - 4% Retired/semi-retired - 11% Employed - 76% Homemaker - 4% Other - 6%	Not collected	Not collected
<b>Club Member</b>	Not applicable	Not applicable	Yes - 43% No - 57%	Not collected	Not collected
<b>Household Income</b>	Not applicable	Not applicable	Less than \$20,000 - 2% \$20,000 to \$39,999 - 2% \$40,000 to \$59,999 - 12% \$60,000 to \$79,999 - 12% \$80,000 to \$99,999 - 17% \$100,000 to \$119,999 - 14% \$120,000 to \$139,999 - 12% > \$140,000 - 16% I prefer not to answer this - 12%	Not collected	Under \$20,000 - 7% \$20,000 to \$39,999 - 13% \$40,000 to \$59,999 - 14% \$60,000 to \$79,999 - 23% \$80,000 to \$99,999 - 8% \$100,000 or more - 25% Not stated - 10% Ave. \$73,987
<b>Motivations</b>	Not applicable	Not applicable	Enjoy the experience of wilderness  View and enjoy the scenery Enjoy quietness and be away from crowds  Explore new areas Experience solitude	Not collected	To get a break from your day-to-day environment To relax and relieve stress To see or do something new and different To create lasting memories To enrich your relationship with your spouse/partner/children

*Note.* Edmonton region includes Sherwood Park, Spruce Grove, St. Albert, & Stony Plain. Nearby communities include Hinton, Grande Cache & Brule.

<sup>a b c</sup> Results from trail cameras, trail & in-depth surveys from this thesis project.

<sup>d</sup> Parks Canada. (2003). *2003 mountain park visitor survey: A yearlong survey of visitors to Banff, Jasper, Kootenay, and Yoho National Parks of Canada*. Retrieved from <http://friendsofkootenay.ca/sites/default/files/Parks%20Canada%202004.pdf>

<sup>e</sup> Lang Research Inc. (2007). *Canadian travel market wilderness activities while on trips of one or more nights: A profile report*. Retrieved from [http://tp.alberta.ca/tourism/research/docs/ca\\_tams\\_historical.pdf](http://tp.alberta.ca/tourism/research/docs/ca_tams_historical.pdf)

### 5.1.2.2 Park Familiarity or Awareness

A summary of respondents' familiarity with Willmore is summarized in Table 38. Participants were familiar with allowable activities and with features, rules, or regulations and park attributes. Half of respondents were not familiar with the managing agency for Willmore and a large proportion was not familiar with Whitebark pine or its ecology. Respondents had some familiarity with the protected areas status of Willmore, if there were public roads in Willmore, species at risk and adjacent parks; however a subsection of respondents had no familiarity with these features. Future education and outreach should be focused on elements that respondents were less familiar with. Various outreach methods can be utilized depending upon the type of user group. Though it was not an aspect of this study, it would be interesting to gauge familiarity by user type, which would help pinpoint more strategic communication approaches.

**Table 38. General Willmore Familiarity**

<b>Attribute</b>	<b>Familiarity</b>	<b>Rating</b>
<b>Activities</b>	Familiar with permitted park activities	Good
	76% were not sure or thought sightseeing by helicopter was allowed	Needs improvement
<b>General</b>	27% were not sure or did not know Willmore has official protected areas status	Needs improvement
	29% were not sure or thought there were public roads within Willmore	Needs improvement
<b>Species at Risk</b>	Close to 40% of respondents were not aware of species at risk in Willmore	Needs improvement
<b>Rivers</b>	Familiar with Willmore rivers	Good
<b>Managing Agency</b>	Nearly 50% were unfamiliar with the managing agency for Willmore	Needs much improvement
<b>Whitebark Pine</b>	Close to 93% were not sure or did not think whitebark pine was found in Willmore	Needs much improvement
	56% were not sure or did not think whitebark pine was an important food source for other animals	Needs much improvement
	95% did not know or thought whitebark pine grew in valley bottoms at low elevations	Needs much improvement
<b>Adjacent Parks</b>	General familiarity of adjacent protected areas but some confusion with official names and park classifications	Needs improvement
<b>Park Familiarity</b>	Were familiar with Willmore features, rules/regulations, and park attributes	Good

### **5.1.2.3 Views on Willmore Challenges (Risk Perception)**

The top three items that respondents thought posed a high risk to Willmore were the following: “industrial land activity next to Willmore” (59%), “mountain pine beetle outbreaks” (53%) and “declining populations of species at risk that live in and around Willmore” (51%). Understanding perceptions of ecological risk is important, since it has been shown to affect public preferences for policy and management related to natural resources (McFarlane & Watson, 2008). For Willmore, an increased understanding of perceived ecological risk by visitors can help provide insight into understanding stakeholder response to management intervention. This can also inform park communications, extension, and outreach, as well as identifying risks that are important to stakeholders in the development of a park stewardship plan.

### **5.1.2.4 Willmore Management Preferences**

The top five management actions where respondents indicated they strongly disagreed or they disagreed (i.e., greater than 60% combined) were the following: “introduce a maximum length of stay per visit for park users” (73%), “introduce backcountry permit with a user fee in Willmore” (71%), “building designated campsites” (66%), “making areas of the park easier to access by adding bridged river crossings” (62%) and “not having a maximum group size for groups that use Willmore” (49%).

The top five management actions where respondents indicated strong agreement or agreement (i.e., greater than 60% combined) were the following: “educating Willmore users about minimum impact use” (93%), “clearing and maintaining Willmore trails” (89%), “allowing wood fires at campsites within Willmore” (87%), “backcountry patrols by conservation officers to enforce regulations and maintain cabins and campsites” (82%), and “improving maps and information about Willmore for visitors” (80%). These insights on visitor management preferences provide Alberta Parks with valuable information on what visitors support and disagree with. Restrictions on backcountry fees and length of stay appear to be the least popular potential management interventions. In general, study participants were more supportive of management actions that did not impose major restrictions on their freedom.



### **5.1.3 Study Question 3: What are the Spatial Patterns of Willmore Visitor Use?**

Results obtained from the trail surveys indicated the most popular zones for Willmore visitors were zone two (Rock Lake staging area) and zone eleven (Sulphur Gates staging area). This was corroborated by visitation counts that were collected by the trail cameras as described in research question one. Though few GPS Tracksticks were distributed, kernel density analysis revealed that a majority of use occurred in and around the Eagles Nest Pass area, near Rock Lake staging area, and the Eaton Falls and Kvass Flats areas near the Sulphur Gates staging area. High kernel densities may be attributed to more people using an area or fewer people staying longer within an area. It appeared that visitors at the Rock Lake staging area were more exploratory in their patterns of use, and appeared to venture from the main trails to explore ridges, alpine areas, and drainages. This could be due to the terrain of the area being more conducive to ridge access and exploration, the visitor type that the area attracts (e.g., ridge hikers), or the trail conditions such as wide, muddy and trails with high willow growth. Sulphur Gates for example, may have attracted short-term front-country day users that resulted in a high density of use within the first three kilometers of the trail. Used decreased and spread out as visitors travelled further into Willmore.

Learning more about the detailed spatial patterns of visitor use with larger sample sizes and varying user types is important. This information will help allocate resources; such as, staging area redevelopments and improvements to the highest use trails, scheduling of patrols and research planning (i.e., surveys and interviews), education and outreach, monitoring of environmental impacts (e.g., grazing, trail erosion), and trail planning, development, and maintenance among others. Spatial patterns of visitor use may highlight high use areas that over time may potentially result in user conflict and the altering of wilderness values like solitude and escape.

### **5.1.4 Study Question 4: What are the Trip Characteristics and the Main Activities of Willmore Users?**

Trip characteristics and the main activities of Willmore visitors were compared to Park Canada's mountain park visitors (Parks Canada, 2003) and Canadian Market Travel wilderness tourists (Lang Research Inc., 2007) (Table 39). Rock Lake and Sulphur Gates were the most popular trip entry points for visitors. Horse and hiking were both popular travel modes in

Willmore, while mountain biking was much less popular. Backpacking or hiking, horseback riding and hunting were the most popular activities in Willmore. In contrast, visitors to Parks Canada's mountain parks reported a much different experience, which entailed non-wilderness activities; such as viewing the scenery and sites by vehicle, exploring restaurants, and shopping. For Canadian Travel Market wilderness tourists, there were few similarities to Willmore visitors (e.g., enjoyment of wildlife watching and hiking). A higher proportion of overnight visits to the mountain national parks were reported than Willmore; however, the average length of stay was generally shorter. The highest visitation to Willmore was in the summer months (July and August) and during weekends with the most human use occurring between the hours of 11:00 and 16:00 hrs.

Popular trip planning information sources included: maps, the Internet, previous experience and through family and friends. Popular trip planning Internet sites were GrandeCache.ca and Raysweb.net. Google Earth was also used by some participants. Eighty percent of respondents indicated there was sufficient information to plan their trip. For those that did not have enough information, comments about maps and suggested improvement of park information related to trails, campsites, and park activities were mentioned. Most respondents planned their trip to Willmore a minimum of one week ahead of time.

Eighty-five percent of respondents indicated they were either satisfied or very satisfied with their Willmore trip, while 13% were either dissatisfied or very dissatisfied. The top five most mentioned satisfying trip highlights were: (1) "beauty," (2) "solitude or remoteness," (3) "wilderness experience," (4) "wildlife," and (5) "non-motorized." For dissatisfying trip aspects, the top five most dissatisfying aspects were: (1) "trails, signage, or markers," (2) "weather and smoke," (3) "litter," (4) "camps," and (5) "perceived damage by horses."

**Table 39. Trip Characteristics of Willmore Visitors Compared to Mountain National Parks, and Canadian Wilderness Activity Visitors**

Attribute	Trail Cameras <sup>a</sup>	Trail Survey <sup>a</sup>	2003 Parks Canada Survey <sup>b</sup>	Cdn. Travel Market 2007 <sup>c</sup>
<b>Trip Entry Point</b>	Big Berland - 6% Cowlick Creek - 4% Rock Lake - 42% Sulphur Gates - 48%	Big Berland - 7% Cowlick Creek - 2% Jasper National Park - 1% À la Pêche Lake - 1% Little Berland - 1% Rock Lake - 52% Sulphur Gates - 36% Victor Lake - 1%	Not applicable	Not applicable
<b>Travel Mode</b>	Horse - 51% Hiking - 48%	Hiking - 62% Horseback - 39% Mountain bike - 2% Wagon - 1%	Not collected	Not collected
<b>Activity</b>	Backpacking - 13% Hiking - 33% Horseback - 37%  Hunting - 16%  Mountain biking - 1% Other - 1%	Hiking - 46% Horseriding - 28% Hunting - 8%  Sightseeing - 4%  Mountain biking - 3% Other - 11%	Driving & sightseeing - 54% Eating in a restaurant - 45% Shopping - 35%  Sightseeing & landmarks - 32%  Hiking - 27%  Walking - 21% Visit the hot pools - 16%	Wildlife viewing - 78% Hiking, climbing & paddling - 72% Ocean activities (e.g., swimming in ocean, sunbathing) - 68% Boating & swimming (e.g., motor boating, swimming in lakes) - 68% Sports & games (e.g., tennis, board games) - 46% Fishing - 42% Cross-country skiing & snowshoeing - 41%
<b>Trip Type</b>	Day - 53% Overnight - 47%	Day - 40% Overnight - 60%	Day - 36% Overnight - 64%	Not collected
<b>Trip Length</b>	Not applicable	Ave. length - 4.6 nights Aggregate nights - 2244	Ave. Length - 3.4 nights	Not collected
<b>Seasonality</b>	July - 33% August - 28% September - 19%	Not collected		Not collected
<b>Timing (Day of Week)</b>	Weekends - 60%	Not collected		Not collected
<b>Timing (Day)</b>	11:00 to 16:00 - 71%	Not collected		Not collected

*Note.* Trail camera trip entry point includes only incoming Willmore visitors at staging areas. For activities, some totals are greater than 100% as respondent could indicate more than one option. Trail cameras operated from mid-June until December, 2010. Sulphur Gates trail camera was missing 18.9 days of data collection due to human tampering.

<sup>a</sup> Results from trail cameras and trail surveys from this thesis project.

<sup>b</sup> Parks Canada Agency. (2003). *2003 mountain park visitor survey: A yearlong survey of visitors to Banff, Jasper, Kootenay, and Yoho National Parks of Canada*. Retrieved from <http://friendsofkootenay.ca/sites/default/files/Parks%20Canada%202004.pdf>

<sup>c</sup> Lang Research Inc. (2007). *Canadian travel market wilderness activities while on trips of one or more nights: A profile report*. Retrieved from [http://pr.alberta.ca/tourism/research/docs/ca\\_tams\\_historical.pdf](http://pr.alberta.ca/tourism/research/docs/ca_tams_historical.pdf)

### **5.1.5 Study Question 5: What is the Relationship Between Visitors and the Park?**

Study participants had a complex and dynamic relationship with Willmore. Themes did not exist independently, but were inter-related and dependent on one another depending on the meanings of the individual. Eleven overarching emergent themes were revealed including three sub-dimensions of the overarching theme of parks management. Though there were congruencies of place meanings between participants, there were contested meanings present as well. This project revealed that in-depth survey participants had a moderately-high attachment to Willmore. These attached user segments are important to understand as they are likely to engage in return visitation to Willmore, and they are more likely to invest their time and resources in the stewardship and protection of the park (Halpenny, 2010; Presley, 2003). These users may also be more directly affected by Willmore management actions or decisions, so it is important to identify and subsequently engage these users in stakeholder consultation (Inglis et al., 2008; Smaldone et al., 2005).

## **5.2 Research Implications**

This research utilized a mixed-methods approach which allowed for the examination of park visitors from a variety of lenses resulting in a rich and insightful wealth of information. It contributes to outdoor recreation literature, and especially to discussions relating to visitor monitoring and meanings of place. As discussed, quantitative approaches measuring the strength of attachments have been utilized in much of the place literature, with fewer studies investigating the “what” aspect of peoples’ relationship to place. This study contributes to the expanding body of qualitative literature on place meanings and examined, through an integrative approach, the social and ecological and landscape meanings that people ascribed to place. Researchers, such as Beckley (2003), have identified this integration as a gap and issued a challenge for future researchers to help integrate the ecological and sociocultural aspects of place. The utilization of a mixed-methods approach helped to contribute towards dissolving traditional barriers within the place literature that tend to use one or the other (i.e., either quantitative or qualitative). The in-depth survey gauged participants’ perceptions of activities that may have posed risk to the health of Willmore’s environment (e.g., mountain pine beetle and wildfire). This helped to address the gap in existing knowledge related to ecological risk arising from natural disturbance as identified by McFarlane and Watson (2008). In general, this study contributes to visitor monitoring within a Canadian context. There have been few studies that have focused on visitors to protected

wilderness areas in Canada, specifically Alberta. This study provides the most current and comprehensive visitor profile of Willmore visitors that exists to date. It gathered information that has not been included in past studies, for example: income, how visitors obtained their trip information and planned their subsequent trips, what clubs and organizations did they belong to and their knowledge and familiarity of the park.

As mentioned this study was exploratory. This means there was sparse social data that existed for the study area, innovative study instruments were being piloted, and the performance of the mixed-methods approach was being evaluated (i.e., how well the methods performed). As summarized in the results and discussion section, there were consistencies observed in the results across methods. The consistencies are summarized in Table 40. By filling the gap of human dimension information about Willmore visitors, conservation objectives may be better balanced with recreation objectives.

**Table 40. Corroboration of Project Methods**

<b>Item</b>	<b>Trail Cameras</b>	<b>Trail Survey</b>	<b>In-depth Mail Survey</b>	<b>Interviews</b>
<b>Staging Area Visitation</b>	Sulphur Gates & Rock Lake have the highest visitation	Sulphur Gates & Rock Lake most popular park entry points and trip destination zones	Not applicable	Not applicable
<b>Travel Mode</b>	Horse & hiking	Hiking & horse	Not applicable	Not applicable
<b>Activity</b>	Hiking/backpacking & horseback	Hiking & horseback	Not applicable	Horse and hiking/backpacking
<b>Trip Type</b>	Days trips more popular overall	Overnight more popular	Not applicable	Not applicable
<b>Group Composition</b>	Mainly travel in groups	Mainly travel in groups	Not applicable	Not applicable
<b>Gender</b>	Majority male	Majority male	Majority male	Majority male
<b>Age Category</b>	Majority adults	Majority mature adults (24%) age 50 to 59	Mean age 45.8 years	Mean age 55.5 years
<b>Motivations</b>	Not applicable	Not applicable	Enjoy the experience of wilderness, view and enjoy the scenery, enjoy quietness and be away from crowds	Emergent place meanings themes included aesthetic appreciation, solitude, escape and restoration, and undeveloped and intactness
<b>Place Attachment</b>	Not applicable	Not applicable	Moderately high level place attachment. Mean 3.91 achieved on a scale from 1 = non-attached to 5 = very attached	High levels of attachment revealed through Willmore place meanings. For example, social bonding encompassed memories, events or experiences with family, friends etc., which was also identified as an important place attachment scale item in the mail survey. Interview statements such as being happiest when in Willmore, describing what they love about Willmore, and Willmore being a great place to be, relate to the affective attachment to Willmore
<b>Management Preferences</b>	Not applicable	Not applicable	Generally supported actions that impose little or no restrictions (maintains the aspect of freedom) and supported "leave no trace" education, allowing wood fires (primitiveness) and trail maintenance	Place meanings themes park management and freedom were identified

## **5.3 Methodological Recommendations**

### **5.3.1 Trail Surveys**

Trail surveys were generally a useful study instrument to assist with gathering visitor information at trailheads within a mixed-methods context. As discussed, some users (e.g., hikers) were more likely to complete surveys than others (e.g., stock users). Therefore, if utilized alone, this instrument would not provide a representative sample of Willmore users. Given this limitation, trail surveys may be useful to consider for future studies, depending on the user type and the associated research questions. For example, trail surveys may be suitable for research pertaining to hikers, but would be less suitable for capturing information about commercial stock users. Self-administered surveys for gauging general park visitor feedback and comments are a possibility. Self-administered surveys to gather commercial group information would not be likely without greatly enhanced effort and resources, focused communications, relationship building, and dissemination of the survey (i.e., through uniformed staff etc.). Past user surveys in Willmore have excluded commercial users (e.g., McFarlane & Watson 1998; 1999) since summer licensed guides were supposed to be submitting their seasonal trip summaries to the managing agency. This did not and does not appear to be consistently occurring. It is suggested park managers focus on enhancing outfitter and guide relationships and encourage the submission of their post-season trip information. There may be hesitation on their part to submit this information, as they may feel it may not benefit them. As such, clear communications and trust needs to be developed. Consistent follow-up to obtain post-season trip information needs to occur. The distinction between commercial and non-commercial groups is sometimes difficult to distinguish. For example, some groups may be guided but are not commercial. Clear communications for all user types to complete surveys including licensed summer outfitters, guides, and trappers will need to be developed. The distribution of surveys through conservation officers seemed to be an effective method, and is recommended for future surveys especially if the frequency of backcountry patrols is increased. Conducting in-person surveys at Rock Lake or Sulphur Gates staging areas during peak periods, such as long weekends during the summer months, is also an option. Compliance rates for trail survey completion should be investigated to further evaluate participation rates and subsequent effectiveness for various Willmore user types.

Trail survey respondents preferred paper-based trail surveys. However, if the Alberta Parks website is enhanced and updated, this may attract higher web traffic to the site, and dissemination of an online survey could perhaps gain more attention and popularity. The evolving demographic of park visitors may shift the popularity of paper surveys to digital online surveys. As technology grows there may be alternative methods of Internet survey dissemination. In this study, trail surveys were only distributed for one visitor season (June to November). It takes time for users to become aware and accustomed with trail surveys. Response rates may increase as people become more aware over time if surveys are available on a consistent and ongoing basis. The map included with the trail survey appeared to be popular with visitors. In some instances, the map was removed from the survey and not returned. Increasing the availability of hard copy maps or providing online maps is recommended.

For the survey design itself, it is recommended to add a space for the survey participant to provide a contact phone number in addition to an email address. It was sometimes difficult to reach people through email. An improved coding scheme for surveys to better track what staging area the survey was completed at is recommended. It is also recommended that survey kiosks be used as comment boxes if not being used to disseminate trail surveys. This provides users and opportunity for their feedback, which would be of value to park managers and staff.

### **5.3.2 GPS Trackstick Packages**

GPS Tracksticks were a new and innovative research instrument and their potential as a social science study instrument was piloted through this research. It is not recommended that GPS Tracksticks are issued to users ahead of time. Often trips into the backcountry or wilderness areas entail a multitude of gear and equipment, so the chances of losing the Trackstick before the trip begins is likely. This was illustrated by the loss of two Tracksticks issued to users ahead of time within this study. It is recommended that GPS Tracksticks are only issued to visitor information centres where staff have the time to monitor the Trackstick inventory and will remember to issue the devices to users going into an area. It was found the Grande Cache Tourism and Interpretive Centre left the Tracksticks unattended at the project display table for users to voluntarily take. This was not a successful set-up as it leaves the devices vulnerable to being taken or not properly signed-out and effectively monitored. Most visitor information centres are busy locations so they do not have the staff, resources or time to effectively monitor



and promote the use of the Tracksticks. The two exceptions were the Switzer Park and Hinton Visitor Information Centres. Though relatively few visitors to the centres planned to visit Willmore, information centre staff made an excellent effort to distribute and inventory the Tracksticks. The Jasper Visitor Information Centre was not provided Tracksticks as they had challenges managing just the trail survey drop-box (it ended up getting lost along with all of the surveys), and it was predicted that few if any visitors going into Willmore would be present there. It is recommended that signs get posted on the visitor information centre counters, so visitors are aware of the project and can inquire if the attendant forgets to mention it. The following is an example of the type of messaging that is recommended: “are you planning a trip to Willmore? If yes – please ask how to complete a survey.”

It was common for users to only capture a portion of their trip route with the GPS Tracksticks. However, if the user remembered to turn the unit on, the Tracksticks collected spatial trip locations. GPS tracking technologies hold good potential for backcountry visitor monitoring. Prices are decreasing while technology is continually evolving. In order to maximize the benefits of the Super Trackstick unit, it is recommended to follow the methods presented in this study along with the following steps:

1. Provide clear verbal and written instructions for the participant to leave the Trackstick turned on for the entire duration of their trip (including the return trip even if it is the same route out), or to only turn the unit off at the end of the travel day and on at the start of the travel day. Leaving the unit on all the time may consume more battery power and will result in extended stopping times; however, this would address the challenge of the user forgetting to turn the unit on that causes missing data and gaps. These options should be investigated and tested in future Trackstick studies.
2. Consider the use of high quality rechargeable batteries.
3. Do not issue Tracksticks to users ahead of time. Instead, issue them as close as possible to their trip departure time. This avoids losing units before the actual trip begins.
4. Improve options for carrying or mounting the Trackstick for variety of user types (i.e., horse, bike, hiking), especially for rugged wilderness areas. The Trackstick will require clear visibility of the sky to obtain good satellite reception. Perhaps the attachment of a clear bag or pouch could be investigated. Provide specific instructions that the Trackstick

cannot be carried inside a jacket pocket, back-pack or saddle bag. This will hinder the unit's ability to collect satellite information.

5. Experiment with the operation of the Trackstick in a variety of terrain and forest canopies, with various user types (e.g., horse, hiker, mountain biker) and in varying seasons and temperatures (e.g., winter).
6. Provide field personnel with training on how to properly use the Trackstick so they can answer user questions and properly instruct users how to use the device. A demonstration of how to change the batteries in the Trackstick should be given to users planning longer trips.
7. Record the phone number of participants that are issued Tracksticks so they can be contacted if there are questions about the Trackstick or if it does not get returned post-trip.
8. Provide an incentive for the user to return the survey and the Trackstick (e.g., a map of their trip will be emailed or mailed to them).
9. Do not distribute Tracksticks to information centres that do not have available time or staff to properly manage and distribute the Tracksticks. Do not permit the Tracksticks to be left unattended in the information centre (e.g., display areas or the counter). They need to be distributed and managed by staff members to help ensure they do not go missing and are properly tracked.

With the continual evolution in GPS technology, it is likely there are other suitable models of tracking devices that could be utilized. Alternative and more cost-effective options may be possible, so this should be investigated if new GPS tracking devices are being purchased. Within this study, the trails layer for Willmore was a limiting factor. Future improvement of the trails layer is recommended including the following: GPS data collection of missing or incorrect trails, creation of a network or route system, and collection and the addition of more detailed trail attributes (e.g., name, surface or type, width, condition, status, data source, etc.). A high quality trails layer is an important GIS base layer for resource planning and management. An accurate and complete trail layer would assist parks management and decision-making since the trail information would be more accurate, detailed, and recent. Other relevant GIS layers should be maintained and updated such as inventory and monitoring layers (i.e., grazing information,

campsites, park points of interest etc.). Where possible, all layers should be based on GPS data and not older hand digitized locations.

### **5.3.3 Trail Cameras**

Reconyx trail cameras are recommended for use in future visitor monitoring. The cameras offered high resolution images, rapid image capture, and effective battery and storage capacity for image data. They were an excellent instrument in the collection of visit counts and visitor characteristics. Given the challenge with gathering survey information from stock users, trail cameras can also assist in the collection of information pertaining to stock users that has been a challenge in past Willmore human use studies (McFarlane & Watson, 1998, 1999; Alberta Sustainable Resource Development, Range Management Branch, 2001). However, it is essential that trail camera users have a thorough understanding of their legal responsibilities prior to camera deployment (Meek et al., 2012). It was important to tag or label the trail camera once it was deployed in the field so visitors were aware the camera was a research instrument and not a private camera. As was done in this study, messaging at the trailheads should be utilized to inform visitors of trail cameras in the area. Cameras should not be installed in locations of expected privacy (e.g., campsites, rest spots, etc.). They should only be installed at main entry points to the park. Staging areas or trailheads are not considered wilderness but are instead entry points to access wilderness, so trail cameras are suitable at these locations. Only the minimal amount of cameras required should be installed. It is recommended that trail cameras in the backcountry to monitor visitation is avoided to maintain privacy and the primitive quality of wilderness unless deemed critical for research purposes.

Depending on the time and distance to access trail cameras, cameras should be monitored frequently to insure they are functioning and to help reduce data loss should camera tampering or malfunction occur. Evolving trail camera technology (i.e., cellular and WiFi enabled cameras) may help assist in this task by reducing field visits (where cellular network coverage is available or where wireless transmitters are implemented). These capabilities will also depend on the site location and site attributes and in some cases the availability of an Internet connection. These camera technologies are capable of delivering thumbnails of newly acquired images to the user's mobile phone or email address, or users can access a webpage to view images depending on the type of camera. This would assist in determining if there are potential issues with the camera. For

example, it would be apparent if images indicate tampering are captured, and subsequent images are not being captured. At the time of writing, a directive for the use of remote cameras was being developed by Alberta Tourism, Parks and Recreation to help guide the use of cameras for park research. It will be important to communicate and disseminate this directive to not only researchers, but also to park stakeholders. Trail cameras within this study collected data for one visitor season and should be implemented year-round to capture variation in seasonal use and long-term trends. During initial camera image coding and classification, it is recommended that group size attributes for humans and horses are coded and/or subsequently calculated. Age categories for image coding may be reduced to infant or child, and teenager/adult/senior. Proper ethics approval should be required by researchers along with Alberta Parks' research approval prior to the deployment of future trail cameras. The installation of private trail cameras by user groups or individuals within Willmore should be prohibited due to moral, ethical, and privacy issues, and potential alteration of wilderness values. Trail cameras and counters should only be permitted for approved research or academic projects, and not for game monitoring for hunting related purposes within Willmore

#### **5.3.4 In-Depth Surveys**

A high response rate was obtained in this study through the use of mail questionnaires, which were completed by users who had initially filled out a self-administered trail survey and voluntarily provided their contact information. Though this is not a representative sample of all Willmore users, it collected a variety of important information that may not have been gathered through other instruments. It is suggested that the use of detailed questionnaires is continued as a form of visitor participation, and as a study instrument for gathering visitor information for Willmore. Recommendations include: reducing the length of the survey to fewer than eight pages, and investigating other distribution methods (e.g., in-person, the Internet, CTR permit applications etc.) that are not dependent on the participant having completed a trail survey in order to participate. This may assist in capturing information from additional park user segments. With a larger sample size, more detailed statistical analysis would be possible, which would derive more detailed visitor attributes and information.

### **5.3.5 Interviews**

Interviews were conducted with a variety of park visitors, which produced detailed place meanings information. Because of the challenges associated with obtaining high sample sizes within Willmore (i.e., visitors are dispersed spatially and temporally and certain user groups do not complete surveys), it is recommended that qualitative methods are employed where applicable and where resources permit. Interview data helped capture thoughts and feelings of participants that in some cases were not captured through other study instruments. The in-depth interviews provided deep and rich description of the relationship between visitors and Willmore. Interviews provided an opportunity for park users to contribute to our understanding of Willmore, since past opportunities for stakeholder involvement appears to have been limited. Interviews can also be an excellent way to foster and enhance relationships with users.

## **5.4 Key Management Recommendations**

The following section summarizes key management recommendations for the park managing agency. As discussed in the introduction, wilderness management is often more about people management than park management. The integration of human dimension information throughout the various facets of park planning will be critical for effective future stewardship of Willmore. Key management recommendations are summarized by four overarching themes: 1) the development of a site-specific stewardship plan, 2) recommendations for visitor monitoring, 3) stakeholder involvement, 4) development of a wilderness education program, and 4) personal observations. Recommendations are based on findings derived from the main research questions and information gathered from the literature review.

### **5.4.1 Development of a Site-Specific Stewardship Plan**

Willmore does not have a park stewardship (i.e., management plan); therefore, the development of an overarching Willmore Park stewardship plan should be an immediate priority. Managing a park is similar to managing a business, and many prominent businesses are successful and sustainable due to a guiding business plan. Within a protected areas concept, this guiding document is known as a management plan. “Wilderness management actions must be guided by formal plans that state specific area objectives and explain in detail how they will be achieved. Without such clear statements, management can become incremental, uncoordinated, and even counterproductive” (p. 186) to the goals and policies related to wilderness protection”

(Dawson & Hendee, 2009). The lack of a management plan for an area can result in potential unmanaged activities and associated harmful ecological effects (Reeves & Walsh, 2007). For example, these authors determined during the time Lakeland Provincial Park and Recreation Area was without a parks management plan, these areas were pressured by OHV use, industrial development, and overfishing, which posed serious ecological risks to the areas (Reeves & Walsh, 2007).

Within Alberta Parks, management plans provide guidance for ongoing daily parks management as well as a longer-term vision for the park(s) (Alberta Tourism, Parks and Recreation, 2013b). More specifically, they include the following:

- Describe parks and the surrounding environment and community.
- Identify government goals for the park and how these goals will be achieved.
- Provide objectives and guidelines on how the natural and cultural heritage of a park will be preserved.
- Detail the type and extent of recreation, education, and tourism opportunities that will be supported in an area, and how they will meet the needs of the community.
- Provide opportunities for ongoing review and public consultation on park management (Alberta Tourism, Parks and Recreation, 2013b, para. 1).

Site-specific protected area management plans are important because they provide overarching direction for stewardship of the area's natural and recreational values (Alberta Tourism, Parks and Recreation, 2013c). Site specific plans "set out objectives and strategies for conservation, development, interpretation, and operations" (Alberta Tourism, Parks and Recreation, 2013c, para. 1).

Public involvement is an important component of wilderness management planning, and both park managers and the public have opportunities to learn throughout the process (Dawson & Hendee, 2009). The planning process also provides stakeholders and the public opportunity for their input (Reeves & Walsh, 2007). It was identified by project interview participants in this study that there was users' support for a parks management plan for Willmore. This was identified through the emergent "parks management" theme including its sub-themes of "balance," "planning and management," and "preservation and protection." Participants identified their desire for pro-active planning and management of Willmore. Through the self-administered trail surveys completed in this project, participants identified many issues related to

parks management as their general survey comments (e.g., prescribed burns, grazing, etc.). Many of these issues would likely be identified in a future management plan. Gaining an understanding of stakeholder preferences and opinions prior to the development of a regional management plan is critical for safeguarding the social support and acceptance of the plan (Pavlikakis & Tshihrintzis, 2006). As the management plan is the overarching guiding document for the area, potential associated programs, initiatives, research (e.g., wilderness education plan, marketing initiatives, monitoring, etc.) should feed into and be guided through the plan. Therefore the creation of a plan is a priority. This leads into the recommendation of a visitor monitoring program, which would help inform a stewardship plan for Willmore.

## **5.4.2 Recommendations for Visitor Monitoring**

### **5.4.2.1 Implementation of a Long-Term and Consistent Visitor Monitoring Program**

Sound information is required for recreation and visitor management (Manning, 2011). Often outdoor recreation locations vary in their resiliency, location, uniqueness, and visitor diversity resulting in the need for site-specific studies (Manning, 2011). The visitor monitoring component of this research was a snapshot in time. This snapshot provided a clear and critical picture that Willmore requires a consistent, year-round, and long-term visitor monitoring program. This will allow the determination of trends over time, and will develop a sound foundation of human dimension information from which future management decisions can be based upon. It was revealed through this study that visitor monitoring studies have been sporadic through time and inconsistent in the data collected with studies occurring in the early 1980s, late 1990s, and only one study occurring within the last ten years (i.e., 2009). Too often wilderness studies are conducted with the intent that a single study at one point of time will guide the stewardship of the area for many years (Dvorak et al., 2012). It is important to learn if and how visitors and their trips have changed in order to plan and adapt stewardship strategies and evolving societal interests and needs (Dvorak et al., 2012).

Visitor monitoring is one of the base studies from which management and land use plans are drafted upon (Kajala et al., 2007), therefore, this information can assist in the creation of a future stewardship plan for Willmore. It is suggested that a mixed-methods approach to visitor monitoring is utilized to balance the pros and cons of each instrument, and to provide an effective representation of Willmore visitors. An identified gap from previous research along

with results from this study, indicate a lack of information about commercial users (i.e., guides, outfitters, registered trappers, and commercial trail operators). Some researchers indicate the proportion of visitors using outfitters on their trips is declining (Roggenbuck & Lucas, 1987). Questions such as this along with questions pertaining to the demographics of clients that use outfitters cannot be determined in Willmore, because outfitter information has not been collected. The exception has been sporadic and intermittent collection of information from CTRs. A comprehensive visitor monitoring system needs to encompass commercial use, which has not been accurately captured to date. It is recommended that improved methods are developed to gather consistent trip information from Willmore commercial users including hunting groups, trappers, and guides. Follow-up on obtaining consistent year-end summaries from commercial trail operators and a program to obtain year-end summaries from the other commercial users should be developed and implemented. This may not capture all commercial use as the line between commercial and non-commercial is sometimes blurred; however, it will be an improvement on the current gap in information pertaining to commercial users.

#### **5.4.2.2 The Utilization of Trail Cameras at the Main Staging Areas**

It is recommended that trail cameras are utilized as a component of a visitor monitoring program. As demonstrated in this project, they were an excellent instrument for obtaining visitation numbers, trip and visitor characteristics, wildlife and stock numbers (e.g., horses), and can potentially be operational year-round. For example, trail cameras from this study identified horses as a popular mode of travel in Willmore, and historically it has been difficult to collect accurate stock numbers through other methods (e.g., self-administered surveys). Group sizes should also be counted in future studies. Visitation numbers are strongly tied to the monitoring of changes (Kajala et al., 2007). These changes can affect the structural demographics of visitors and their opinions (i.e., satisfaction) of the qualities of the area and their experience. The monitoring of change may assist in determining how for example, the addition or removal of infrastructure may alter visitor satisfaction. Monitoring may also help to measure if management decisions and policy has led to a change in the visitor profile of an area (i.e., visitation numbers are strongly tied to the monitoring of changes) (Kajala et al., 2007). For example, have the long-term visitors been replaced by short-term day users or is the area only visited by the long-term users? This ties into the recommendation of the continued use of visitor surveys.



#### **5.4.2.3 The Continuation of Visitor Surveys**

“A good visitor monitoring program consists of visitor surveys and visitor counting. The knowledge of both the numbers of visitors and their characteristics are complementary to each other and both kinds of knowledge are important in planning and management processes” (Kajala et al., 2007, p. 20). Though some user types appeared to complete trail surveys more than others, self-administered surveys may still hold potential biases, especially depending on the type of study and associated research questions. Other methods of survey delivery offer very good potential: such as, in-person surveys or interviews, mail, and online survey options. The mail-out in-depth survey used in this study had a very high response rate and random sampling of respondents should be investigated to help obtain various representations of Willmore users. Surveys are also an instrument that can be used in participatory planning (Kajala et al., 2007). They provide an opportunity for participants to share their insight into the planning process and can have an impact on the stewardship of an area. The future use of trail surveys or voluntary self-registration needs to include compliance monitoring. A major investment of effort will be required to capture commercial users, including clear communications and relationship building, to encourage participation by this segment.

#### **5.4.2.4 GPS Tracksticks**

Though there is a potential paradox between using technology and the maintenance of the primitive aspect of wilderness, within a research context it is recommended to use GPS Tracksticks as a method to collect visitor spatial information within Willmore. The patterns of spatial-temporal information that can be collected from these devices can provide managers and park users with a wealth of information in a relatively unobtrusive manner. It is recommended that spatial-temporal patterns of various park user types are further examined. For example: the spatial patterns of use compared between stock users, hikers, and mountain bikers and through various seasons of use. This information can be useful for park resource planning, conflict, and potential environmental effects. If it is found that most hikers are not using the trail system but are heading off-trail into alpine or ridge areas, educational messaging can be geared towards this use pattern along with park stewardship actions. Temporal use between user types should also be examined. For example, do spatial patterns of use for various users vary between the seasons (e.g., spring versus fall) and do they vary between local and non-locals? How deep are users (i.e., distance and time) travelling into Willmore?

### **5.4.3 Stakeholder Involvement**

The following section pertains to recommendations for the involvement and participation of Willmore stakeholders.

#### **5.4.3.1 Stakeholder Analysis**

Interview participants identified the need for balanced and improved stakeholder involvement through the emergent place meanings sub-theme balance, which was under the main theme parks management. As asserted by Reeda et al. (2009), the first step in working with stakeholders is to identify who “holds a stake in the phenomenon under investigation” (p. 1937). In other words, who are the stakeholders? Next, stakeholders are categorized or classified, and then relationships between stakeholders are analyzed (Reeda et al., 2009). This study revealed there were many passionate individuals that care and are concerned for Willmore; however, these individuals and groups may not be currently identified or their voices may not be heard among the louder, more assertive, and visible stakeholders. Stakeholders may also include non-local users and groups. As identified by his study, people and groups travel to Willmore from many parts of Alberta and beyond. Stakeholders may also include the general public and those who have never visited Willmore. For example, some people may value Willmore because it is wilderness (i.e., existence value) but may have never visited the park.

#### **5.4.3.2 Enhance Alberta Park’s Willmore Webpage**

Involving stakeholders in park stewardship decisions also entails a component of keeping stakeholders informed and aware of such things as park issues, initiatives, news, and research. The Alberta Park’s webpage should be updated and utilized as a tool to help keep stakeholders informed and engaged. For example, the website can contain a section of park management news, current and proposed research, opportunities for involvement, and opportunities to collect stakeholder opinions through online surveys or through online submission of comments. The website could also be used to solicit email contact information from individuals. These individuals would be those interested in receiving park information updates (e.g., electronic newsletter) or for future input or stakeholder participation. Participants in the *2008 Survey of Albertan’s Priorities for Provincial Parks*, indicated that developing an email list to keep them updated on park status updates would be a preferred method for obtaining their input (The Praxis Group, 2008).

#### **5.4.3.3 Staging Area Kiosks**

A comment box should be provided for visitors to provide general hand-written comments at each of the four main Willmore staging areas. This may help capture park visitors that do not use the Internet. The Alberta Parks website address should be posted at kiosks.

#### **5.4.3.4 The Creation of a Willmore Working Group**

The creation of a multi-stakeholder working group for Willmore is recommended. This group should consist of a balance of Willmore stakeholders (e.g., non-governmental organizations, commercial users, private users, managing agency staff and managers). Working group meetings would be scheduled on an ongoing and consistent basis. Creation of this group may aid in the development and creation of improved partnerships between the park and internal stakeholders. This group would have an important role in the development of a park stewardship plan.

#### **5.4.3.5 Fostering of Partnerships**

Future engagement of organized groups (i.e., *Friends of*, conservation, etc.) to collaborate on projects may assist in fostering new partnerships. Booth et al. (2009) found in their study that participants' knowledge of the park status was related to their membership with organized conservation groups. They also suggested that agencies may have improved success in educating the public on their conservation efforts through partner collaboration with organizations and groups.

#### **5.4.3.6 The Development of Volunteer Opportunities**

Opportunities for the involvement of current and potential visitors should be investigated and developed where possible. Managers need to partner with the users and the general public in order to help preserve wilderness areas (Potts, 2007). As learned through this study, highly attached users are often those willing to invest in the area they are passionate for. Opportunities that focus on involving highly attached visitors would be mutually beneficial to the managing agency and the visitor. These users should be sought out and their participation in park projects encouraged by Alberta Tourism, Parks and Recreation. Willmore has operated under limited resources more often than not. Volunteers can help address this challenge while at the same time empowering users through their involvement and providing a sense of ownership in the stewardship of Willmore. In-depth study participants had a moderately-strong attachment to the

park and indicated a passion to become involved and to volunteer their time for Willmore projects. However, there appeared to be few past opportunities or programs for involvement. Interview participants indicated they were interested in contributing to Willmore, but were unsure how. The opportunity to involve the individuals and groups needs to be seized. Potential suggestions are volunteer opportunities to assist with park research, trail maintenance and repair, and visitor monitoring. Volunteers representing specific user groups may be an effective way to deliver park messaging (Manning, 2011). Citizen science is a growing idea where data gathered by the public is used in research and monitoring. Opportunities may be developed in Willmore to help engage attached users and those who are interested in assisting with data gathering. For example, park users can GPS segments of trails they have cleared and maintained or that are impassable and Alberta Parks can utilize this data to update the trails layer, trail attributes and conditions. Stakeholder groups can also access their membership for volunteer events or maintenance and seek grants to address park stewardship goals.

#### **5.4.3.7 Informal Communications**

Informal communications (e.g., informal face to face meetings, social functions, etc.) should be used to reach stakeholders that may not use the Internet or may not be captured through other methods. This may be a suitable approach to exchanging information with commercial and tourism operators in Willmore. Informal communication can be effective in developing and maintaining relationships, especially when more personalized feedback is desired or when pertaining to sensitive issues (Annan, 2008).

#### **5.4.3.8 Place Meanings**

The resonating message that resulted from the web of Willmore meanings was that stakeholders can be better understood along with their views on management challenges (e.g., wildfire and prescribed burns) by gaining insight into their meanings of place. Management decisions (e.g., fire management, infrastructure such as cabins, bridges, signage, etc.) have the potential to alter the present wilderness character of Willmore, which may subsequently affect visitor place meanings. Opportunities for discovering and revealing meanings of place along with opportunities for stakeholder involvement should be developed, initiated, and maintained especially related to park stewardship planning. This important point is reiterated by Davenport and Anderson (2005) who asserted that “contentious issues like development can be better

understood by identifying and understanding place meanings” (p. 639). In general, the incorporation of place into parks management may result in many benefits including streamlined planning, improved ability to build on common ground, reduced conflict and litigation, and more enduring management plans (Yung et al., 2003). One of the greatest values of public involvement is the impact on participants’ knowledge, attitudes, and opinions concerning other stakeholders, the agency, and the resource (Stout, Decker, Knuth, Proud, & Nelson., 1996). Incorporating the opportunity to learn, understand and acquire place based information such as stakeholder place meanings and place attachment should be investigated. For example, public participation geographic information systems (PPGIS) hold exciting promise for stakeholder engagement and also for identifying place. PPGIS “are methods that seek to democratize spatial information and technology, often through mapping at local levels of social organization to produce knowledge of place” (Brown & Weber, 2013, p. 457). PPGIS can include a variety of methods for participatory stakeholder engagement that surround the incorporation of spatial information (Brown, 2012).

As found by Yung et al. (2003) in their study of Rocky Mountain Front Range meanings, the presence of some contested place meanings for Willmore (e.g., World Heritage site designation, appropriate park activities, and park research) suggests the need for meaningful stakeholder involvement in park management and an active stakeholder role in the decision-making process. Different forms of stakeholder consultation can be implemented according to the challenges at hand and may be difficult at first to implement. However, this effort may result in stakeholder empowerment, increased future participation in management and park planning, along with improved collaboration. Some issues may remain contentious and political, but first steps are required in order to discover commonalities and congruencies. As stated by Flint et al. (2008) “it is important to resist the temptation to seek only those strategies for which consensus can be reached.” (p. 1184). Often some of the most contentious issues may appear to have no solution in sight, but at a minimum they need to be itemized and prioritized and tackled over time. Dialogue is important for critical issues even if they take time and perseverance to solve (Flint et al., 2008). In some cases, there will need to be acceptance that consensus will not be possible (Flint et al., 2008).

#### **5.4.4 Development of a Wilderness Education Program**

The development of an overarching wilderness education program should guide education and outreach for Willmore with the goal of enhancing the knowledge of both current and potential Park visitors. This program would feed directly into the park stewardship plan. Booth et al. (2009) suggested enhanced environmental education and improved communications regarding the value and benefits of parks in order to improve the understanding of conservation efforts and also by encouraging responsible recreation behavior. According to Hansen and Carlson (2007), other benefits of wilderness education include: (1) the improved visitor awareness of wilderness programs that may have low understanding (e.g., fire), (2) the promotion of park stewardship values (e.g., scientific research, the importance of watersheds, etc.), and (3) education can help build and maintain collaborative partnerships that help benefit wilderness as well as other stewardship functions. Parks staff can convey themselves through various outreach opportunities in a positive, professional, and pro-active manner. This helps build and develop new and existing partnerships with user groups, non-governmental organizations (NGOs), other park stakeholder groups, and individuals (Hansen & Carlson, 1997).

As indicated by Hansen and Carlson (2007), wilderness communications, education, and outreach are essential components of an overall wilderness stewardship program. The suggested focus should not only be the value of protected areas such as Willmore, but on a general foundation of Willmore specific park information related to rules, regulations, minimum impact practices, flora, fauna, ecology, safety, and park history. It was identified through the trail and in-depth surveys, that litter left in Willmore from visitors detracted from other user's visits and was one of the top three reasons for their trip dissatisfaction. Mail survey participants indicated high support for educating Willmore users about minimum-impact use. This identifies an important area of focus for education and outreach related to minimum-impact techniques. The in-depth survey revealed that participants had high education levels, which suggest that many Willmore visitors would be a suitable audience for a wilderness education program and associated communications. As determined through the Willmore web of place meanings, participants identified freedom as being an important place meaning. Education programs do not aim to regulate or to control visitors. Rather these programs promote the freedom of choice through the provision of sound information for visitors to base their choices upon (Dawson & Hendee, 2009).

#### **5.4.4.1 Enhancement and Redevelopment of the Alberta Parks Willmore Website**

As discussed earlier, the Alberta Parks Willmore website should be updated and redeveloped to better convey park information and educational messaging. This study revealed that only 29% of mail survey participants for example, use the Alberta Parks Willmore website for trip planning. Previous research suggests that educational messaging during the pre-trip planning phase may be more effective for park visitors (Manning & Lime, 2000). Nearly 50% of mail survey respondents were not familiar with the land management agency for Willmore, close to 40% were not aware of species at risk in Willmore and the majority of respondents were not familiar with whitebark pine. These items of low familiarity indicate areas where education should be focused.

Interview participants indicated they were enthusiastic to learn information about Willmore but were not aware of where or how to obtain park information. This should be made simple and effective for visitors. The Alberta Park's web page for Willmore contains sparse information, and currently visitor websites contain more park information than that of the managing agency. Suggested website content includes the following: general park information and history, permitted activities, rules and regulations, safety, ecology, how to help the park, how to become involved (i.e., volunteer opportunities), and partnership links to other relevant websites. The U.S. Parks Service website is one of many example sites that can be used as a template. It is suggested that Internet mapping capability (i.e., the ability for people to interact with Internet maps and data) is incorporated within the site. Paper maps were revealed as an important trip planning resource for park visitors and that visitors also desired electronic maps. Hard copy maps of Willmore should be available for purchase through the website and a revised map of Willmore should be developed. Internet mapping could be linked to PPGIS and crowdsourcing (i.e., contributions of work, data, etc. from groups of people) efforts in the future where for example, park visitors can note their wildlife sightings or trail clearing efforts and this information would feed into the website as park information.

#### **5.4.4.2 Smartphones and Mobile Technologies**

Though it has been noted by some that those that participate in wilderness activities are below average Internet users in planning and booking trips (Lang Research Inc., 2007), this trend may be changing. According to Hannan (2013), the expansion in the use of smartphones and

mobile devices is expected to surpass all other Internet access devices. The use of smartphones and tablets can be an important pre-trip planning tool and source of park information and education. It is estimated by 2016 that Canadian smartphone users will surpass 16 million users (Fossum, 2012), and recent data indicates that 54% of Canadians already own a smartphone (Techvibes, 2012). Clearly, these devices will be the communication device of the future. Many park agencies have already started to use smartphones in their education and health outreach (Hannan, 2013). Though cellular coverage is currently very limited in Willmore, this may change in the future and improved cellular coverage or more readily available satellite coverage may occur. Smartphones can be utilized in wilderness education both pre and post trip. Educational applications can also be designed that do not require cellular or WiFi coverage but are pre-loaded to the device prior to the trip (e.g., safety messaging, rules and regulations, park ecology, and natural history). Other possibilities include utilizing smartphones for crowdsourcing park information, such as trail conditions, river crossing water levels, litter, non-native plants (i.e., weeds), and wildlife sightings. Spatial location data would be collected as part of the observation. There is also future potential of smartphones for visitor survey dissemination and for acquiring visitor feedback.

#### **5.4.4.3 Improvement and Maintenance of Staging Area Kiosks**

At the onset of this project, it was found that many of the staging area kiosks were in general disrepair and lacking maintenance and most were missing park information (e.g., rules and regulations, maps, etc.). Wilderness staging areas can be helpful in promoting responsible wilderness etiquette (Hansen & Carlson, 2007). It is recommended that staging area kiosks are improved and maintained as a source for targeted park messaging. Communications and messaging should be carefully designed and developed, as past research has found the delivery of too many messages can result in information overload and low knowledge retention by park users (Cole et al., 1997). Maps have been shown to attract people to kiosks and should be installed and made available where possible.

#### **5.4.4.4 Information Centres**

Local information centres can be utilized to help disseminate park information. It is important that information centre staff members are trained and well-informed about Willmore. Visitors to information centres provide an opportunity for park education and awareness.



Although these visits can be short in duration, they offer an opportunity to educate a number of visitors prior to entering the park (Hansen & Carlson, 2007). Local visitor information centres can also be utilized for displays about Willmore or research occurring in Willmore. Promotion of “leave no trace programs” can be conveyed by staff to visitors who are planning a backcountry trip. As discussed previously, the maps that accompanied the trail survey were often collected by the user and were a popular item. It is recommended that hard copy maps are made available for purchase for park visitors at visitor information centres.

#### **5.4.4.5 School Programming and Curriculum**

Through the use of trail cameras, this study identified that the majority of visitors to Willmore are adults (85%) with generally few children and teenagers visiting the park. As provincial demographics are changing, so are the demographics of Willmore visitors. As such, it is imperative to foster relationships with those currently not using the park as they may be key future supporters for Willmore. Therefore, there is much potential for Willmore Wilderness Park to be incorporated into school curriculums to help raise the awareness of Willmore and wilderness areas to younger children and teenagers. Willmore could be a case study that ties into topics, such as species of concern within the park, geography, history, and traditional aboriginal use of the park. School interpretation programs can be delivered in the classroom, through the Internet, at trailheads, or visitor information centres. High school outdoor education classes could incorporate trips to Willmore. The main goal is to provide exposure to children, youth, and young adults so they will be aware of Willmore and the importance of protected areas in general. This could be initially piloted in local community schools (e.g., Grande Cache and Hinton). Prior research has found schools and universities to be important in raising awareness of protected areas and national parks (Papageorgiou, 2001).

#### **5.4.4.5 Promote and Develop Opportunities for Under-Represented Demographics**

Information gathered from trail cameras and self-administered trail surveys suggested that fewer women than men visit Willmore, and that Willmore attracts mainly an adult demographic. It also appeared that few ethnic minorities visit Willmore, though this requires more in-depth investigation. It is recommended that opportunities for visitor experience are investigated to involve new and under-represented demographics and age categories such as ethnic minorities, women, and youth. There is much potential for Willmore as a destination for

organized wilderness groups like Outward Bound (i.e., organized groups that use the wilderness as a learning or healing place). Organized outdoor groups may help foster confidence and skills within a social setting that may help promote a connection to nature, relationship with the park, and physical fitness, along with many other potential values.

#### **5.4.4.6 Alternate Methods**

The dissemination of appropriate information to visitors while they are experiencing the park could establish effective environmental citizenry for issues surrounding nature conservation within protected areas (Papageorgiou, 2001). Wilderness field staff visits and interactions with visitors can be an effective method of information delivery pertaining to wilderness education (Manning & Lime, 2000). Increasing the frequency and the geographic area of park staff patrols by horse and foot is suggested. Increased patrols could assist with not only enforcement and monitoring, but also for education and fostering improved relationships between the managing agency and park visitors (including commercial operators). The education of park visitors during backcountry patrols could be valuable in helping achieve behavioral-based stewardship strategies like “leave no trace” education. Outfitters, commercial operators and volunteers may be effective partners to collaborate with for wilderness communications and education (Manning & Lime, 2000).

#### **5.4.5 Personal Observations**

##### **5.4.5.1 Marketing Plan for Willmore**

Information derived from the trail cameras, a trail survey, and a mail survey helped develop the most accurate visitor profile of Willmore visitors that exists to date. Prior to this research, assumptions were being made as to the demographic of Willmore visitors. Marketing an area based on a visitor profile that is formulated from assumptions can drain resources and result in targeting an inappropriate or perceived visitor segment. Knowledge of visitor characteristics and origin are useful for effective marketing (Kajala et al., 2007). This study determined Willmore is popular with both horse and hiker users for a variety of activities. Therefore, if future marketing for the park occurs, the marketing plan should be balanced and not focussed towards one particular user group. It is recommended that a site-specific stewardship plan for Willmore is developed prior to the commencement of marketing initiatives. After plan completion, the need for a Willmore marketing plan should be first evaluated with the inclusion

of stakeholders. Marketing is often initiated to create awareness and to attract more people to an area or attraction. Strong caution and careful consideration needs to be exercised if marketing for Willmore is implemented without first having a guiding stewardship plan. Many respondents asserted Willmore is not suitable for the novice wilderness traveler, but is suited towards those with more advanced wilderness skills. Targeting inappropriate market segment(s) may result in the attraction of non-suitable visitors to the park, which may demand infrastructure, activities, and experiences, that are not congruent with the character and values of a protected wilderness park. As a result, current park users may be displaced or their place meanings altered, thus resulting in potential conflict and alteration of their trip experience. Marketing may also cause increased park visitation. This in turn may create conflict or alter place meanings and wilderness values, such as solitude, primitiveness, naturalness, escape, and freedom. Willmore is an area for the more experienced traveler and where the visitor is not experienced, the services of a guide are recommended. Attracting visitors that are not prepared or experienced enough for a rugged backcountry trip may result in an increase in backcountry injuries, incidences, and rescue efforts.

## **5.5 Suggested Future Research Directions**

### **5.5.1 Future Research in Willmore**

The following section pertains to suggested future research within Willmore Wilderness Park:

10. As stated by Kruger (2006) “we must ask who feels invited to certain outdoor recreation sites, and what messages are sent out to people about who belongs here” (p. 162). Data collected from trail cameras at the main staging areas in this study revealed that horse and hiking related activities are both popular activities in Willmore. Are certain groups and individuals conveying a message of who “belongs in Willmore”? Hawkins and Backman (1998) found that consistent visitation in a natural outdoor recreation setting may result in “strong feelings of attachment, even ownership” (p. 99) among visitors. In their study, the strongly attached vacationers viewed themselves as more of a resident than a visitor and many perceived “their established presence and patterns of traditional holiday-making as reflective of their *way of life* and, for many, as an expression of their family roots” (Hawkins & Backman, 1998, p. 99). It was beyond the scope of this study to investigate in a detailed fashion the place attachment of specific user groups in Willmore; however, it

is recommended that future studies investigate group attachment in Willmore. This information would be valuable in forecasting potential park-based conflict within users and between park managers and park user groups and planning for collaboration and consensus.

11. The use of PPGIS or participatory GIS to further investigate the place meanings and values of park users and traditional aboriginal knowledge. Mapping of values and meanings of place would be valuable in park stewardship planning and the development of a stewardship plan.
12. Investigation of place meanings of ethnic minorities and youth, which appeared to be under-represented in this study.
13. Studies focusing on human use on the north and west boundaries of Willmore. These areas were not a focus within this study, but learning the levels of human use entering and exiting the park is important. These baseline numbers will be important if proposed hydroelectric developments are implemented (e.g., Blueberry Creek area), which may allow quicker and easier access into the west side of Willmore. At the time of writing use appears to be relatively low due to challenging access (i.e., distance to trailheads, overgrown and low maintained trails, challenging terrain, etc.).
14. Qualitative approaches, such as structured and semi-structured interviews along with focus groups, have excellent potential in gaining a better understanding into specific user groups. This is especially relevant for an area like Willmore where there appears to be generally low visitation and spatially and temporally distributed visitors. In an area like Willmore, it is difficult to obtain large enough samples for quantitative statistical analysis, so qualitative studies have much potential. For example, if outfitters are found to have low self-administered survey rates, then perhaps a more qualitative approach may enable improved relationship building, thus allowing for an enhanced opportunity for information gathering from these specific user groups. In some U.S. wilderness areas it has been suggested that outfitting of clients is decreasing; however, it is not known if this is occurring in Willmore due to a lack of baseline outfitter information. This could have important implications for visitor experience, the economic benefits from hunting as well as the livelihood of outfitters and guides.

15. It is recommended that approaches to measuring the visitor experience of Willmore visitors are also pursued. Measuring the Willmore trip experience as it unfolds over time may provide interesting insights. Investigation into group encounters would be valuable to investigate, especially if park use increases at certain staging areas and regions of the park increases. The occurrence, frequency and potential effects should be examined.
16. Examine compliance rates with various methods of visitor monitoring (e.g., self-administered trail surveys).
17. Willmore park visitor knowledge should be monitored over time, and investigating knowledge levels between various user types should be undertaken. For example, by investigating the knowledge levels of park users on park ecology, minimum impact skills, etc., education and outreach can be pro-actively developed based on the results (i.e., focus on principles or areas that visitors may not be familiar with or exhibit low scores). Gauging park visitor familiarity can also be helpful when park staff and managers are faced with behavioral-based stewardship. Park users can be gauged as to what they know compared to what they should know (Papageorgiou, 2001). Monitoring visitor knowledge over time may assist in evaluating the effectiveness of education programming. The acceptance of educational programs by visitors is seldom a concern; however, the effectiveness is often pondered (Dawson & Hendee, 2009).
18. This study focused on visitors that either used the park for work or for recreation, but what does the public at large know about Willmore? If the goal is to inform more people that Willmore exists, then what are their current knowledge levels, feelings about places like Willmore, and opinions related to protected wilderness areas in general? The Willmore Act (RSA 1980 cW-10 s3) reminds us that: “The Park is dedicated to the use of the people of Alberta for their benefit, education and enjoyment, subject to this Act and the regulations, and shall, by the management, conservation and protection of its natural resources and by the preservation of its natural beauty, be maintained for the enjoyment of future generations” (Province of Alberta, 2000, p. 2). What role does the public play in Willmore?
19. Investigate patterns of human and wildlife movement. A mixed-methods approach similar to this project may be utilized (e.g., trail cameras, GPS, surveys, etc.). Data from existing wildlife GPS collars (e.g., caribou and grizzly bear) could be utilized.

20. Investigate more detailed patterns of human use in Willmore using GPS Tracksticks.

Compare the spatial patterns of use between stock users, hikers, and mountain bikers? How deep are users venturing into Willmore? Do users venture off-trail? Temporal use between user types should also be examined. For example, do spatial patterns of use for various users differ between seasons (e.g., spring versus fall) and do they differ between local and non-locals? If so, which user types tend to do so? The attainment of a larger sample size would provide more detailed information (e.g., camping locations, average trip length, on-trail versus off-trail use, stops at features. These can be examined to derive visitor profiles based on patterns and use behavior. Visitor profiles would be valuable in stewardship planning for the park and form a component of the visitor monitoring program. Calibration of the units within varying terrain is recommended to determine their accuracy for finer-scale applications.

21. The utilization of both qualitative and quantitative aspects in the exploration of place is recommended for future research. The qualitative aspect added depth and richness to our understanding. It holds exciting potential for examining visitor relationships to the park through time to help suggest causation of place attachment.

### **5.5.2 Future Research in Wilderness**

Watson (2000) asserted that “future wilderness visitor research should focus more on the effects of urbanization, technology, and information and communication on the way people use and value wilderness” (p. 59). Changing demographics of wilderness users, Canadians, and North Americans in general may change how people will relate to wilderness in the future. The following research is suggested for wilderness areas in general bearing in mind there is some overlap with the previous section:

1. Focus on gaining an understanding of under-represented wilderness demographics. For example, Zinn and Graefe (2007) identified there were a lack of studies that examined the relationship of emerging adults and wilderness values and wilderness related behavior. Youth and young adults will be the future users of Willmore and wilderness areas in general. There are indications that today’s youth may differ substantially from older generations (Zinn & Graefe, 2007). Potts (2007) reminds us that the threat to wilderness is the people that visit wilderness, but rather from the people who are not visiting

wilderness. He also points out that “you cannot love a park or wilderness to death” but “apathy and irrelevance surely can” (Potts, 2007, p. 5). Future support for wilderness largely depends on public support. The demographics of local and non-local park users are changing, as well as the Canadian population. Wilderness areas will require the support of the ever-changing Albertan and Canadian population, and an understanding of who does not visit these areas may become as important as who is visiting wilderness.

2. Develop new and innovative mixed-methods approaches to visitor monitoring that can be maintained with limited resources and in a consistent manner to determine trends through time. For example, technology and associated applications for smartphones and tablets are constantly evolving and offer much potential (even where there is no cellular coverage)
3. Investigate innovative uses of GIS as a tool to integrate with other technology, instruments, and techniques. GIS and other associated technology offer much potential in wilderness and outdoor recreation research. GIS capabilities for the inventorying and monitoring of features and resources, planning, and analysis capabilities offer staff and managers an efficient way to better manage resources. According to Hannan (2013) GIS has become an essential tool for park managers and staff. Opportunities to engage park users in the new wave of crowd-sourced data may offer interesting and innovative avenues of wilderness research.
4. Continue the examination into less tangible wilderness meanings such as spirituality, freedom, and escape and restoration. With increasing pressure of everyday life, stress appears to be on the rise for many, so the importance of wilderness areas for health, physical fitness, and mental restoration will become even more important to learn and understand from a wilderness management perspective.
5. Expand research into the use of technology in wilderness. How common is the use of GPS, satellite phones, GPS emergency devices (e.g., SPOT Satellite GPS Messenger) by users? Are wilderness values (e.g., primitiveness) or wilderness experiences being compromised by the use of technology? How do visitors feel about the suitability of technology (e.g., trail cameras, counters, etc.) in wilderness?

## 5.6 Final Concluding Thoughts

The purpose of this research was to gain a better understanding of Willmore Wilderness Park visitors. Prior to this study, there was dearth information about Willmore park users. This study contributed to filling this gap by developing a foundation of human dimension information for Willmore. This was done through a mixed-methods approach (i.e., trail cameras, trail surveys, mail survey, GPS Tracksticks, and interviews) to demonstrate an approach that can be utilized to gather sound visitor information. This approach was suited to a limited budget, which often is a challenge for many protected areas and wilderness parks around the world. It also provided insight into improved visitor monitoring techniques and contributed to the existing body of place meanings research.

Obtaining human dimension information is not only important for Willmore, but also for protected areas, parks, natural, and wilderness areas around the world. Many potential multi-level benefits may be realized by becoming more informed about visitors. For example, learning about visitor numbers and patterns, demographics, motivations, preferences, perceptions, knowledge, and place meanings, is of great value to park managers. This information leads to improved and proactive decision-making and effective policy formulation. Budgets may also be more accurately developed and effectively managed, because they are based on robust information related to visitors and visitation and not assumptions. This helps strike an improved balance between recreation and conservation goals and objectives. The visitors themselves are often interested in park visitor information. Today's visitors may become tomorrow's informed and proactive stakeholders. Learning about park visitors is of value to both the visitors and managers alike.

Willmore has managed to maintain its present character over time, but as with many other protected areas, it faces potential future challenges. For example, increasing development pressures around the Willmore boundary, changing demographics, and potential divergent meanings of place will require strong leadership, collaborative efforts, and sound information to help address these and other challenges. Cooperation, mutual respect, and working together amongst park users will be the key. Improved collaboration with the managing agency will be critical - visitors need management support and managers need the support of visitors. In the end we are drawn to enjoy and experience places like Willmore for very similar reasons. Areas such



as this are rare. They allow us to return to our primitive roots in an ecosystem that is relatively intact and where the land has remained close to how it was many thousands of years ago.

While pondering the final conclusion for this chapter, I came upon a poem by Willmore patrolman Harry Edgecombe that was written in November 1982, which expressed his thoughts on Willmore. I would like to conclude this thesis with Harry's thoughts as a tribute to Willmore. His words speak the thoughts and feelings of many Willmore users, including my own.

**A Poem about the Willmore Wilderness  
by Harry Edgecombe  
November 1982**

I am patrolling the Willmore  
for the Alberta forestry,  
following the track of the horse and pack  
the way it used to be.

The years have slipped by,  
all too quickly it seems.  
many changes have been made in the forestry trade  
for the past it is memories and dreams.

Today I am back where I started  
patrolling the mountains once more;  
with horses three, and only me  
it is the same as it was before.

Time has no real meaning,  
today is all that is real.  
You find your way through the mountains gray,  
happy is the way I feel.

There is a message carried in on the breeze  
a meaning that is easy to see;  
a message told by the mountains old,  
LET IT BE. LET IT BE.

This is not the land for loggers  
who fells and cuts up the tree,  
not for oil or ore -- they have been here before  
LET IT BE. LET IT BE.

The message rings loud and clear:  
This is not the land of industry!  
No motel or store on the valley floor.  
just LET IT BE. LET IT BE.

All around me the world is gleaming,  
the streams are rushing along.  
Spring has aroused the bear from its mountain lair,  
the valley is singing a song.

A song of a land of beauty,  
a land that is wild and free  
from the shimmering glow of the mountain snow  
LET IT BE. LET IT BE.

As I ride along the mountain trail  
an owl sleeps in an old dead tree  
He opens an eye as I ride by,  
and hoots, LET IT BE.

As I pass through the Rock Creek valley  
there are changes new to me.  
The forest fire scene has all turned green  
where a blackened mantle used to be.  
A little farther on my way  
you can see where the mountain's broken,  
memories sadden for a spell as I pass the cliff where she fell;  
a young girl's life was taken.

That night in camp at the summit  
my mind goes wandering ahead,  
to the Indian grave and the life it gave

to the man that lies there dead.

He sleeps alone on the mountain trail,  
facing the morning sun.  
His message to me is Let me be!  
Please tell it to everyone.

I am a Ranger  
that has gone down this trail before.  
I have loaded my tack on a horse back  
and ready for what is in store.

I have read the signs in the mountains,  
I have known what it is like to be free  
with beauty grand in this wild land,  
it is very plain to me.

We should leave the park as it is,  
don't change a land that is free.  
The message is clear for all to hear,  
LET IT BE. LET IT BE.

Credit: (Edgecombe, 1982, pp. 20-21)

## 6.0 APPENDICES

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### Appendix A – References

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## Appendix B – Sample Survey Station Rock Lake Commercial Staging Area (Post Mounted)





**Appendix C – Sample Survey Station Sulphur Gates Commercial Staging Area  
(Mounted on Existing Kiosk)**



## Appendix D – Willmore Self-Administered Trail Survey



### Willmore Wilderness Park User Survey

The University of Alberta with support from the Foothills Research Institute would like to understand how you use Willmore Wilderness Park. This will help staff to better manage backcountry areas within Willmore. We request that **one member** from your group complete this voluntary survey as you **enter or exit** the park on **each visit**. Please deposit completed surveys in the survey box or mail it to the address provided below. Surveys are also available online at:

[http://foothillsresearchinstitute.ca/pages/willmore\\_project/willmore\\_project\\_survey.aspx](http://foothillsresearchinstitute.ca/pages/willmore_project/willmore_project_survey.aspx)

All responses will be treated in a confidential manner.

**Please note:** this is not a trip safety registration system. Willmore is a remote wilderness area and you are responsible for your own safety.

Trip Start Date: \_\_\_\_\_ Time: \_\_\_\_\_  
Day Month Year

1. From which trailhead to Willmore did you start your trip?  
☐ Rock Lake   ☐ Sulphur Gates   ☐ Big Berland   ☐ Cowlick Creek  
☐ Other \_\_\_\_\_ (specify)
2. How many times have you visited Willmore before this trip? \_\_\_\_\_  
And how many times in the past 12 months? \_\_\_\_\_
3. Where are you from?  
☐ Canada – Postal Code: 

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☐ United States – Zip-code: 

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☐ Other country \_\_\_\_\_ (specify)
4. Who are you travelling with? (check all that apply)  
☐ Alone   ☐ Family   ☐ Guide/outfitter   ☐ Business associates/colleagues  
☐ Spouse/partner   ☐ Friends   ☐ Organized group/club  
☐ Other \_\_\_\_\_ (specify)
5. How many males and females in your group (including you) fall into the following age categories:

	<u>Male</u>	<u>Female</u>		<u>Male</u>	<u>Female</u>
9 and under	_____	_____	40 to 49	_____	_____
10 to 19	_____	_____	50 to 59	_____	_____
20 to 29	_____	_____	60 and over	_____	_____
30 to 39	_____	_____			
6. How is your group traveling within Willmore? (check all that apply)  
☐ Hiking   ☐ Horseback   ☐ Mountain bike   ☐ Other \_\_\_\_\_ (specify)
7. Are you visiting Willmore on a ☐ Day trip **or** ☐ Overnight trip – If overnight, what is/was the expected date you will complete your trip: \_\_\_\_\_  
Day Month Year



Survey continued on the  
back page



8. What is your main activity of your trip into Willmore? (please only check one)

<input type="checkbox"/> Hiking	<input type="checkbox"/> Fishing	<input type="checkbox"/> Photography	<input type="checkbox"/> Wildlife viewing
<input type="checkbox"/> Biking	<input type="checkbox"/> Sight-seeing	<input type="checkbox"/> Scientific Research	<input type="checkbox"/> Job-related
<input type="checkbox"/> Hunting	<input type="checkbox"/> Horse riding	<input type="checkbox"/> Climbing	<input type="checkbox"/> Other _____

(specify)

9. It is very important to learn what specific trails are used in the Willmore Wilderness Park. Please refer to the map attached to this survey and using a crayon trace your intended route or the route that you took on your trip using lines and arrows  Also, indicate with a  where you plan to camp or have camped during your current visit by referring to the numbered campsites on the attached map. If you are not sure how to do this, please list the trails and campsites you used/intend to use:

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10. Do you have any general comments about your visit to the Willmore Wilderness Park?

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11. May we contact you to participate in additional information gathering related to your visits to the Willmore Wilderness Park? The information gathered will assist staff in maintaining and improving your visitor experience in Willmore.

☐ Yes      ☐ No

If you answered yes: would you be willing to complete a more detailed questionnaire?

☐ Yes      ☐ No

Would you be willing to participate in an in-depth interview/focus group?

☐ Yes      ☐ No

If you answered **yes**, please provide your name and address along with your mailing/email address:

a) Name: \_\_\_\_\_

b) Mailing Address:


_____	_____
Address	City/Town
_____	_____
Province/State and Country	Postal/Zip Code

c) Email Address \_\_\_\_\_

**Thank you for taking the time to complete this survey!** If you have comments or questions please contact Debbie Mucha, at (780) 865-8330.

**If you missed finding a drop box for your survey, please mail to:** University of Alberta c/o the Foothills Research Institute, Willmore Wilderness Survey, P.O. Box 6330, Hinton, Alberta T7V 1X6.

Survey No.

**Please go to the next page  
for the map** 

## Appendix E – Super Trackstick GPS Tracking Device (Telespial Systems)



## **Appendix F – General Trackstick Data Processing Steps for Use in Arcmap Software**

1. Outliers were omitted from the export file (i.e., the GPS was left on while driving to the trailhead, etc.)
2. The locations were exported as a .csv file and edited in Microsoft Excel to remove any spaces from field names, add an identifier field, and to delete the maplink field.
3. The locations were also exported as a Google Earth fly-through .kmz file.
4. Arcmap Arctoolbox was used to convert the .kml to a layer file. The layer was exported to a feature class within a geodatabase.
5. A geoprocessing model was created in ModelBuilder to project the tracks to NAD 83-Zone 11.
6. A geoprocessing model was created to import the .csv file, convert it to a feature class, project it from WGS84 to NAD 83, Zone 11 and to add utm Easting (x) and Northing (y) fields and coordinates.

## Appendix G – Reconyx Trail Camera



## Appendix H – Trail Camera Microsoft Access Database Coding Attributes

Attribute	Data Type	Attribute Type	Attribute Description
CamDataID	AutoNumber	na	Image ID - Access database autonumber
CameraName	Text	na	Foreign key from camera table (dtCameraInfo)
Filename	Text	Actual	Image filename .JPG format (e.g., Img0004 - from lower left corner of image)
ImageDate	Date/Time	Actual	Date of the image capture in medium date format (e.g., 25-Jun-10)
ImageTime	Date/Time	Actual	Time of the image capture in long time format (e.g., 4:00:00 PM for 16:00)
Temperature	Number	Actual	The temperature at the time of the image capture (degrees Celsius)
MoonPhase	Text	Actual	The moon phase at the time of the image capture (new moon, waxing crescent, first quarter, waxing gibbous, full moon, waning gibbous, waning crescent)
ObjectType	Text	Actual	What object type triggered the camera image (human, animal, unknown)
AnimalSpecies	Text	Actual	What animal species (e.g., deer, elk, dog, horse etc.) was captured on the image (includes unidentified and unknown). Use na for humans
TravelMode	Text	Actual	Travel mode of the individual (horse, hiking, mountain biking, horse and wagon, horse and hiking, vehicle, ATV, skiing, snow-shoeing, unknown, na)
Activity	Text	Estimate	Estimated activity type of the individual determined by gear/clothing present on the image and day or overnight trip for some activities. For example, hunting was coded as an activity if it was hunting season and a rifle/bow, hunting clothing (camouflage), animal parts etc. were observed. Activities: hiking day), backpacking (overnight), mountain-biking, fishing, climbing, trail running, skiing, snow-shoeing. Camping was coded as an activity only for Big Berland as vehicles could access crown land adjacent to the park boundary where the camera was located
TripType	Text	Actual	Trip type for humans (day, overnight trip, or unknown). If the individual was not observed coming back out of the same trailhead within the same day, the trip was coded as overnight. Pack horse(s) or large back packs may indicate overnight trip unless the person was observed exiting the same day
Gender	Text	Actual	Gender of the individual for humans (male, female, unknown) and na (animals)
EstimatedAgeCategory	Text	Estimate	Estimated age category of the individual for humans (infant - in stroller or being carried, child - able to walk and under 12, teenager 12-18 years old. Adult 18 to 65 years old, Senior - 65 and above)
GroupType	Text	Estimate	Is the individual travelling as a group or solo (for both humans and animals). A solo event has five minutes between events
HorseType	Text	Actual	For horses only - does the horse have a rider? Either yes, no, unknown. Will be na for non-horse records. No rider means packhorse or no equipment on horse or horse with saddle but no rider
SpotCamera	Text	Estimate	Did the person/animal observe, recognize, or investigate the camera
Direction	Text	Actual	Direction of travel on trail for both humans and animals (in, out, or unknown). Will depend on specific trailhead which direction is in or out of Willmore
Comments	Memo	na	General comments or observations
<i>Note.</i> na = not applicable. Actual refers to attributes that are objective in nature and estimate refers to attributes that are more subjective and prone to assumptions.			



## **Appendix I – Reconyx Trail Camera Menu Settings**

### **Change set-up – Advanced - Trigger:**

- Motion sensor – ON
- Sensitivity – HIGH
- Picture Interval – RapidFire
- Quiet Period – No delay
- Pics per Trigger - 3

### **Change set-up- Advanced - Time Lapse:**

AM Period – OFF

PM Period – OFF

### **Change set-up- Advanced - IMAGES:**

Night Mode - High Quality

Resolution – 3.1 MP

Temperature – Celsius

### **Change set-up- Advanced – USER LABEL**

Add label name for camera e.g. Rock Lake

## Appendix J – In-Depth Mail Survey

### Exploring the Human Dimension: Visitor Use Analysis of Willmore Wilderness Park



Thank-you for taking the time to complete this questionnaire. The information you provide will help improve park management and ensure that your Willmore experience is being maintained and improved.

Please try to answer all of the questions. If there are any questions you do not wish to answer, please leave them blank and move to the next question.

All information you provide is confidential. Your name will never appear with your answers. Only a summary of everyone's answers will be made public.

Please return your completed questionnaire as soon as possible in the postage paid envelope provided.  
**We appreciate your help with this study!**



**Dear Willmore Wilderness Park user:** Please ensure that the person whom this survey is addressed to fills out the following questions. This survey asks for information relating to your recent visit to the Willmore Wilderness Park. **Thank you** for taking the time to complete this survey. **Please return the completed survey in the addressed, postage paid envelope provided to you as soon as possible.**

**Section 1: Your Willmore Trip**

Survey No. \_\_\_\_\_

First, we would like to ask you about your trip into the Willmore Wilderness Park in Alberta.

1. From which of the following sources did you get information to plan your trip to Willmore? (*Please check all that apply*)

<input type="checkbox"/> Internet	<input type="checkbox"/> Displays	<input type="checkbox"/> Previous Experience	<input type="checkbox"/> Club
<input type="checkbox"/> Book	<input type="checkbox"/> Information Centre	<input type="checkbox"/> Friends/Family	<input type="checkbox"/> Pamphlet/Publication
<input type="checkbox"/> Maps	<input type="checkbox"/> Park Office	<input type="checkbox"/> Other _____	

*(Please specify)*

- a) If you selected "Internet" in the question above, please select or list the websites that you visited:

☐ AlbertaParks.ca    ☐ GrandeCache.ca    ☐ Willmorewilderness.com    ☐ Raysweb.net

☐ Other \_\_\_\_\_

*(Please specify)*

2. Did you find that there was enough information available from the sources you listed in question #1 to plan your trip to Willmore?

☐ Yes    ☐ No    If **no**, what additional information or information sources would be helpful:

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3. How far in advance did you plan your trip to Willmore?

☐ Less than 1 week    ☐ 1 - 4 weeks    ☐ 1 - 3 months    ☐ 3 - 12 months

☐ Greater than 1 year

4. How satisfied were you with your trip into Willmore?

☐ Very dissatisfied    ☐ Dissatisfied    ☐ Neutral    ☐ Satisfied    ☐ Very satisfied

5. What were the most satisfying highlights of your trip?

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6. What were the most dissatisfying aspects of your trip?

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Please continue survey on the next  
page

## Section 2: Willmore Trip Motivation

7. Next, we would like to learn about your reasons for visiting Willmore Wilderness Park.

Please indicate how important each of the following items was as a reason for your visit.

Please circle **one** choice for each item in the following list as shown in the example.

How important were each of these items for  
your visit?

	Not at all Important	Not Important	Neutral	Important	Extremely Important
<i>Example: For fun</i>	1	2	3	4	5
Improve your skills and abilities	1	2	3	4	5
Freedom to make your own decisions	1	2	3	4	5
Relax and rest	1	2	3	4	5
Experience solitude	1	2	3	4	5
Be with others that enjoy similar interests	1	2	3	4	5
Learn about the park	1	2	3	4	5
Be challenged	1	2	3	4	5
Reflect on past memories	1	2	3	4	5
Be away from other people	1	2	3	4	5
Do something with your family	1	2	3	4	5
Explore new areas	1	2	3	4	5
Get exercise	1	2	3	4	5
Enjoy quietness and be away from crowds	1	2	3	4	5
Do something that someone else (e.g., family member) wanted you to do	1	2	3	4	5
Study nature/environment	1	2	3	4	5
Teach others	1	2	3	4	5
View and enjoy the scenery	1	2	3	4	5
Engage in traditional uses of Willmore	1	2	3	4	5
Be with friends	1	2	3	4	5
Enjoy the experience of wilderness	1	2	3	4	5
Learn more about yourself	1	2	3	4	5
Do something creative (painting, photography etc.)	1	2	3	4	5
Grow spiritually	1	2	3	4	5
Take risks	1	2	3	4	5
Other, please specify _____	1	2	3	4	5
Other, please specify _____	1	2	3	4	5
Other, please specify _____	1	2	3	4	5

**Please note:** If you answered "important" or "extremely important" to "engage in traditional uses of Willmore", please list examples of traditional uses:

\_\_\_\_\_

### Section 3: Your Familiarity with Willmore

Learning about Willmore Wilderness Park users and their familiarity with Willmore is important for improving park information (such as websites, brochures, and maps). We would like to learn how familiar you are with Willmore Wilderness Park in the following questions.

8. Are the following activities allowed in Willmore?

	YES	NO	NOT SURE
a) Dirt biking/quading	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Hiking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Sight-seeing by helicopter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Hunting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Mountain-biking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) Oil and gas exploration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) Downhill ski operations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h) Mining	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i) Horse riding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j) Commercial logging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k) River rafting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l) Golfing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
m) Fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
n) Trapping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Definitions:**

**Public road:** a formal road that anyone from the public can access with a car, truck, etc.

**Species at risk:** a naturally occurring plant or animal that does not have all the requirements to stay healthy and have a healthy population.

**Major river:** a flowing body of water that is usually larger than a stream.

9. Are there public roads within the boundary of Willmore?

☐ Yes ☐ No ☐ Not Sure

10. Does Willmore have official protected areas status?

☐ Yes ☐ No ☐ Not Sure

11. Have you seen evidence/signs of mountain pine beetle during your visit to Willmore?

☐ Yes ☐ No ☐ Not Sure

**If you answered yes**, please describe if/how the beetle impacted your enjoyment of Willmore e.g., did you adjust your trip route, campsite location, etc. to avoid the impacts of this beetle?

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12. Are you aware of any naturally occurring animals, plants, or trees in Willmore that are species at risk? ☐ Yes ☐ No

**If you answered yes**, please list the plants, animals, or trees that are species at risk:

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13. Please list major rivers that flow through Willmore:

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14. Who manages Willmore Wilderness Park? (*Please only check one*)

☐ Private agency ☐ Parks Canada ☐ Not-for profit foundation

☐ Alberta Tourism, Parks, and Recreation ☐ Alberta Sustainable Resource Development ☐ Other \_\_\_\_\_  
(Please specify)

15. Please answer the following questions with either "true" or "false" or "not sure".

a) Whitebark Pine is not found in Willmore: ☐ True ☐ False ☐ Not Sure

b) Whitebark Pine seeds are an important food source for a number of animals:  
☐ True ☐ False ☐ Not Sure

c) Whitebark Pine does not grow in valley bottoms at low elevations:  
☐ True ☐ False ☐ Not Sure

16. Please list any protected areas or parks that are located adjacent to Willmore that you are aware of:

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Please continue survey on the next  
page



17. In the next section we would like to know what you noticed during your trip through Willmore.

Please answer (✓) "true" or "false" or "not sure" for each of the following statements based on what you saw on your visit or from your familiarity with the park.

**Definitions:**

**Formal:** structures/items/objects that are built for park users by parks staff.

**Vault Toilet:** a concrete pit/hole over which a toilet structure is built.

- |  |                               |                                |                                   |
|--|-------------------------------|--------------------------------|-----------------------------------|
| a) There are no <u>formal</u> backcountry outhouses or <u>vault toilets</u> at campsites in Willmore               | <input type="checkbox"/> True | <input type="checkbox"/> False | <input type="checkbox"/> Not Sure |
| b) There are <u>formal</u> food poles (for storing your food away from bears) at backcountry campsites in Willmore | <input type="checkbox"/> True | <input type="checkbox"/> False | <input type="checkbox"/> Not Sure |
| c) Visitors can camp wherever they like in the backcountry of Willmore   | <input type="checkbox"/> True | <input type="checkbox"/> False | <input type="checkbox"/> Not Sure |
| d) There are no hand pumps for getting water at backcountry campsites in Willmore                                  | <input type="checkbox"/> True | <input type="checkbox"/> False | <input type="checkbox"/> Not Sure |
| e) There are bridges over rivers that are swift and deep   | <input type="checkbox"/> True | <input type="checkbox"/> False | <input type="checkbox"/> Not Sure |
| f) Fires are allowed at backcountry campsites in Willmore  | <input type="checkbox"/> True | <input type="checkbox"/> False | <input type="checkbox"/> Not Sure |
| g) There is an online system for reserving backcountry campsites in Willmore                                       | <input type="checkbox"/> True | <input type="checkbox"/> False | <input type="checkbox"/> Not Sure |
| h) There are <u>formal</u> picnic tables at backcountry campsites in Willmore                                      | <input type="checkbox"/> True | <input type="checkbox"/> False | <input type="checkbox"/> Not Sure |
| i) There are backcountry conservation officers that patrol Willmore  | <input type="checkbox"/> True | <input type="checkbox"/> False | <input type="checkbox"/> Not Sure |
| j) There are trail markers and/or signs to help guide you on the trails in Willmore                                | <input type="checkbox"/> True | <input type="checkbox"/> False | <input type="checkbox"/> Not Sure |



Please continue survey on the next page

#### Section 4: Your Relationship with Willmore

18. The following section explores your “attachment” or the emotions, feelings and meanings that you assign to Willmore Wilderness Park. Please check (✓) the box that shows how much you agree or disagree with each item as shown in the example below.

ITEM	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<i>Example: I am extremely attached to Willmore</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a) I feel like Willmore is part of me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Willmore is the best place for what I like to do	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) I have a special connection to Willmore and the people I spend time with there	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) The cultural and traditional heritage of Willmore is very special to me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) I would not substitute any other area for doing the types of things I do at Willmore	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) I have strong positive feelings for Willmore	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) I have pleasant memories of spending time with friends and family in Willmore	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h) Visiting Willmore says a lot about who I am	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i) I get more satisfaction out of visiting Willmore than any other park	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j) My attachment to Willmore is mainly due to its landscape and wildlife	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k) When I visit Willmore others see me the way I want them to see me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l) I will (do) bring my family and friends to Willmore	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
m) I am fond of Willmore	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
n) My friends/family would be disappointed if I stopped visiting Willmore	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
o) I feel happiest when I am at Willmore	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
p) I identify strongly with Willmore	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
q) I would be sad if I could not enjoy the physical attributes of Willmore	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### Section 5: Your Views on Potential Willmore Challenges

19. Next, we would like your views on possible issues, challenges, or events facing Willmore Wilderness Park. **Please rate how much risk you think each item listed below impacts the health/environment of Willmore Wilderness Park** by checking off (✓) one box for each item. For example, checking off (✓) the answer “poses high risk” for the item “wildfire in Willmore” means that you feel wildfire would cause harm to the health/environment of Willmore.

#### Definitions:

**Species at risk:** Is a naturally occurring plant or animal that does not have all the requirements to stay healthy and have a healthy population.

**Non-native:** These are species (both plants and animals) that come from some place else and are not natural to their current location.

**Prescribed burn:** The burning of an area by trained personnel through the use of fire. The fire is contained to a predefined area and safety measures are in place to help control the fire.

<b>ITEM</b>	<b>Poses no Risk</b>	<b>Poses Little Risk</b>	<b>Poses Moderate Risk</b>	<b>Poses High Risk</b>	<b>No Opinion</b>
a) Declining populations of <u>species at risk</u> that live in and around Willmore	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Climate change or global warming	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) <b>Wildfire in Willmore</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Mountain Pine Beetle outbreaks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Poaching of wildlife	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) Grazing by horses in Willmore	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) Introduction of <u>non-native</u> plant and animal species	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h) Industrial land activity next to Willmore (e.g., oil & gas, logging and mining)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i) <b>The current number of people using Willmore</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j) Prescribed burns in Willmore	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k) <b>Promoting higher visitation levels in Willmore</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l) Using science to guide management decisions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
m) <b>Lack of park resources such as staff and funding</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
n) Tourism development near Willmore such as resorts, casinos, etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Section 6: Your Willmore Management Preferences

20. In this section, we would like to learn about your park management preferences. **Please indicate (✓) how you feel about each of the following management actions** in relation to Willmore Wilderness Park.

**Definition:**

**Prescribed burn:** The burning of an area by trained personnel through the use of fire. The fire is contained to a predefined area and safety measures are in place to help control the fire.

<u>MANAGEMENT ACTION</u>	Strongly Disagree	Disagree	Agree	Strongly Agree	No Opinion
a) Clearing and maintaining Willmore trails	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Introduce a backcountry permit with a user fee for Willmore	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Implementing <u>prescribed burns</u> in Willmore	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Closing trails/areas of Willmore in order to help protect animals, plants, or trees that may not have healthy populations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Making areas of the park easier to access by adding bridged river crossings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) Not having a maximum group size for groups who use Willmore	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) Introduce a maximum length of stay per visit for park users	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h) Backcountry patrols by conservation officers to enforce regulations and maintain cabins and campsites	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i) Adding/improving trail signs and markers on Willmore trails	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j) Improving/re-routing trails in Willmore	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k) Improving maps and information about Willmore for visitors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l) Providing bear food poles/lockers at Willmore campsites	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
m) Educating Willmore users about minimum impact use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
n) Building designated campsites	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
o) Providing pit toilets/outhouses at backcountry campsites	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
p) Allowing wood fires at campsites within Willmore	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Section 7: About You

In this **LAST** section we would like to ask a few questions about you to determine who is visiting Willmore. We respect your privacy. We will remove your name from our database when we receive your questionnaire, so no one will ever be able to link your answers to you. If there is a question you do not want to answer, you can skip to the next question.

21. You are: ☐ Female ☐ Male

22. What is your present age? \_\_\_\_\_ Years

23. Please indicate which ethnic or cultural group(s) do you most identify with? (e.g., *Canadian, Chinese, German, Irish, etc.*)

\_\_\_\_\_

24. What best describes your household structure: (Please only check one)

- ☐ One-person household ☐ Multiple adult household without children
- ☐ Multiple adult household with children ☐ Other \_\_\_\_\_ (Please specify)

25. What is the highest level of education you have completed? (Please only check one)

- ☐ Less than high school ☐ College diploma ☐ University graduate degree
- ☐ High school graduate ☐ University bachelor degree ☐ Other \_\_\_\_\_ (Please specify)

26. What is your primary occupation? \_\_\_\_\_

27. Are you a member of any of the following clubs or organizations? (Please check all that apply)

- ☐ World Wildlife Fund ☐ Alberta Wilderness Association ☐ Alberta Fish & Game Association
- ☐ Willmore Wilderness Foundation ☐ Alberta Trappers Association ☐ Canadian Parks & Wilderness Society
- ☐ Other (Please specify) \_\_\_\_\_

28. What is your total family income per year before taxes? (Please only check one)

- ☐ Less than \$20,000 ☐ \$60,000 to \$79,999 ☐ \$120,000 to \$139,999
- ☐ \$20,000 to \$39,999 ☐ \$80,000 to \$99,999 ☐ > \$140,000
- ☐ \$40,000 to \$59,999 ☐ \$100,000 to \$119,999 ☐ I prefer not to answer this

**Thank-you for Your Participation!**

**TO RETURN THIS QUESTIONNAIRE, PLEASE PUT IT IN THE POSTAGE-PAID ENVELOPE PROVIDED AND DROP IT IN THE NEAREST MAILBOX - University of Alberta c/o The Foothills Research Institute, Willmore Wilderness User Survey, P.O. Box 6330, Hinton, Alberta, T7V 1X6**

## Appendix K – Interview Guide

### Interview Guide

Thank you for taking the time to participate in this study. I am hoping to learn more about people who visit/use Willmore Wilderness Park (WWP) and why WWP is special to the people that use it. I am particularly interested in documenting your story about your attachment/connection to Willmore. The information that I gather will comprise part of my Master's thesis which will be viewable by the public and the information may also be summarized anonymously for presentation or publication

Before we get started, I want to let you know that your identity as a participant in this study will remain confidential and that I value your privacy. Your name will not be published in written reports or used in any presentations etc. In addition your participation is voluntary and you are free to stop this interview at any point in time should you be uncomfortable with answering any questions. If it is alright with you, I would like to tape record the interview to ensure I am interpreting your information as accurately as possible. The interview may last up to 60 minutes.

#### 1. "Warm-up" – Broad introductory questions:

- a) How long have you visited/used/worked in WWP?
- b) What is the total # of times you have been to WWP?
- c) What do you enjoy doing or what is your main activity while visiting/using WWP?
- d) If you were visiting another country and you had to describe Willmore to someone that has never been to Willmore, how would you describe WWP to them?
- e) When you think about WWP can you tell me three words or phrases that first come to mind? [probe: after descriptors are provided, perhaps probe for a feeling or emotion].

#### 2. "Core" – Main body questions

- a) Tell me about your most **memorable experience** in WWP? [probe where needed to gauge *activities/sites* – the what, why, where, when, who].
- b) **Describe if nature** is important to you [probe: what characterizes their relationship with natural areas]?
- c) Does Willmore feel like Wilderness to you [probe: what conceptualizes it as wilderness].
- d) Are there **places** in Willmore that are **special** to you? Why is this/are these places special?
- e) How important is it for you to **return to WWP** when there are other parks like Jasper National Park nearby that you could go to? Why is it important, what can you get in WWP that you might not find in another location?
- f) Is there anything else that you would like us to know about **your relationship** with Willmore?
- g) Based on your previous experience with WWP, what actions do you think people or organizations should engage in to protect the special aspects of WWP? [probe: how will this ensure memorable, meaningful experiences in WWP will continue for you?]

#### 3. General wrap-up questions

- a) Confirm contact info. (postal code)
- b) Inform the participant how/where project results will be available
- c) Address any questions from the participant

## Appendix L – Summary of Trail Camera Animal Events for all Willmore Staging Areas

Species	Trailhead				Total
	Big Berland	Cowlick Creek	Rock Lake	Sulphur Gates	
Bear spp.	0	0	0	1	1
Black bear	0	0	3	1	4
Cougar	0	0	0	1	1
Coyote	0	0	2	0	2
Deer	5	57	15	19	96
Dog	0	10	150	96	256
Elk	7	5	9	19	40
Grizzly bear	1	0	0	4	5
Grouse	1	0	0	0	1
Hare	0	0	5	0	5
Horse	391	455	2191	1726	4763
Large mammal	1	0	0	0	1
Lynx	0	0	3	0	3
Moose	8	0	0	1	9
Mouse	4	0	0	1	5
Mule	18	11	20	27	76
Red fox	0	0	0	1	1
Small mammal	2	0	2	0	4
Song bird	4	1	0	5	10
Squirrel	1	0	0	2	3
Unidentified	3	2	2	4	11
Wolf	0	0	0	1	1
<b>Total</b>	<b>446</b>	<b>541</b>	<b>2402</b>	<b>1909</b>	<b>5298</b>

**Appendix M – Respondent List of Species of Risk in Willmore (In-Depth Mail Survey Question 12)**

<b>Species</b>	<b>Frequency</b>
Brown trout	3
Bull trout	7
Grizzly bear	33
Mountain goat	2
Caribou	29
Grouse spp.	1
Whitebark pine	7
Wolverine	8
Pine trees (from MPB)	1
Grass spp.	1
Alpine flower spp.	1
Porsild's bryum	3
Swift fox	1
Moose	1
Barred owl	1
Peregrine falcon	1
Harlequin ducks	1
<b>Total</b>	<b>101</b>



**Appendix N – Respondent List of Clubs, Associations, and Organizations (Question 27)**

<b>Name</b>	<b>Frequency</b>
Alberta Chapter of the Wild Sheep Foundation	1
Alberta Chapter of the Wildlife Society	1
Alberta Donkey and Mule Club	1
Alberta Equine Federation	1
Alpine Club of Canada	2
Association of Canadian Mountain Guides	1
Backcountry Horsemen of British Columbia	1
Canadian Land Reclamation Association	1
Castlegar Trail Society Rotary	1
Evergreen Gun Club	1
Interpretive Guides Association	1
Kootenay Mountaineering Club	1
Mountain Wilderness France	1
National Firearm Association	1
Nature Canada	1
Nature Conservatory	1
New Zealand Forest & Bird Society	1
Red Deer River Naturalists	1
Scouts Canada	1
Wapiti Corridor	1
Western Canada Wilderness Committee	1
Wild Sheep Foundation	1

*Note.*  $n = 18$ . Some respondents indicated more than one club or association.

## Appendix O – Lyrics to the Song Church of the Long Grass

### **CHURCH OF THE LONG GRASS** **(words and music by John Wort Hannam)**

Thirty-five degrees for the last six days  
Sure as hell hasn't helped the Blairmore blaze  
But I can see that it's raining in the hills tonight

All wrapped up in a blanket of haze  
Fifty thousand acres of timber razed  
But I can see that it's raining in the hills tonight

I never found salvation in Jesus, whisky or pills  
I never found it in money or the good book  
I found it here in these hills

### **CHORUS**

I belong to the Church of the Long Grass  
The Parish of the Porcupine Hills  
The grass can grow as tall as an old timer's tale  
Some say taller still Yeah, I belong to the Church of the Long Grass  
The Parish of the Porcupine Hills  
I've always seen this land as holy  
I guess I always will

Sadie was my girl from the age of fifteen  
Homecoming and a beauty queen  
And I hear she's still reigning in the town tonight  
Fancied a fella with money and means  
Left me crying like some old has been  
And I hear she's still reigning in the town tonight  
Blue can be a little temperamental, but he's a reliable steed  
If you keep a tight reign and sit tall in the saddle  
He'll give you what you need

Note: Lyrics retrieved from  
[http://www.johnworthannam.com/John\\_Wort\\_Hannam\\_Website/HOME.html](http://www.johnworthannam.com/John_Wort_Hannam_Website/HOME.html) on February 21, 2012.