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## Healthy Outside-Healthy Inside: The Human Health & Well-being Benefits of Alberta's Protected Areas - towards a benefits-based management agenda

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# Healthy Outside-Healthy Inside:

The Human Health & Well-being  
Benefits of Alberta's Protected Areas  
*Towards a Benefits-based Management Agenda*







## **Healthy Outside-Healthy Inside**

The Human Health & Well-being Benefits of Alberta's Protected Areas

*Towards a Benefits-based Management Agenda*

A report submitted to:

Parks Division, Environment and Sustainable Resource Development, Government of Alberta

By:

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## About the CCEA

The Canadian Council on Ecological Areas (CCEA) is an independent national organization constituted in 1982 to encourage and to facilitate the selection, protection and stewardship of a comprehensive network of protected areas in Canada. In 1995, the CCEA became a registered charitable organization. The Council draws its following and support from federal, provincial and territorial government agencies, non-governmental organizations, universities, industry, First Nations and Inuit peoples, and private citizens concerned with protected areas.

The goal of the CCEA is to facilitate and to assist Canadians with the establishment, management and use of a comprehensive viable network of protected areas that represents the diversity of terrestrial, marine and other aquatic ecosystems in Canada. To this end, the work of the CCEA is centred on the following activities:

1. Promoting the value of protected areas for conserving biodiversity and for helping to sustain ecosystems and species for the environmental, social and economic well being of all Canadians.
2. Providing scientific advice and guidance on the design of a nation-wide network of protected areas incorporating both terrestrial and aquatic ecosystems and the selection of areas to complete it.
3. Advancing sound ecological and science-based stewardship practices for protected areas including the management, restoration and use of them for conservation, science, education and heritage appreciation.
4. Monitoring, reporting and disseminating information on initiatives and progress regarding the establishment, conservation, management and use of protected areas in Canada.
5. Assisting in determining the administrative and institutional arrangements for the securement, protection, management and use of protected areas.
6. Communicating and working with regional, national and international interests toward the achievement of Council's goals and objectives.
7. Conducting other such work and activities as may be necessary to support these aims.

For more information, visit the CCEA website at [www.ccea.org](http://www.ccea.org)



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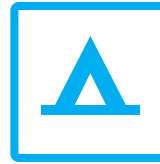


# Executive Summary

This report details the results of an empirical study that examined perceived health and well-being motives and benefits among park visitors (both campers and day users). It does so by examining visitor's uses of and experiences in nature within three Alberta provincial parks (Cypress Hills Provincial Park, Sir Winston Churchill Provincial Park, and Miquelon Lake Provincial Park) and three Kananaskis Country provincial recreation areas (PRAs) (Elbow Falls, McLean Creek, and Elbow River) during the summers of 2012 and 2013. Improved understanding of the social and economic roles of parks, including health and well-being benefits, is identified as a key priority under the Parks Division's *Science Strategy* (Government of Alberta, 2010: p. 22). This study revealed several major findings with important policy and management implications that relate directly to this mandate. These are summarized below, and also in Appendix B. These findings should be of use to both park managers and to public health officials.

## DEMOGRAPHICS, PERCEIVED MENTAL/PHYSICAL HEALTH OF VISITORS, AND VISIT CHARACTERISTICS

- Overall, the (1,515) sample was highly representative of the population of visitors to Alberta's parks and protected areas: 93% of visitors were from Alberta; the sample had significantly higher levels of education than the Alberta population; the average camping party size was 3.5; 35.7% were first-time visitors; 64.3% were repeat visitors; the average length of stay was 3.6 nights; and the most frequent activities were resting/relaxing, day hiking, swimming, and photographing.
- 52.4% of respondents reported being in very good-to-excellent physical health and 42.0% reported being in very good-to-excellent mental health. This is lower than similar values for the Alberta population, which are 62.1% and 72.9%, respectively.
- The 34.7% of respondents that indicated they were under extreme or quite a bit of stress prior to the visit was also higher than the Alberta population value of 23.9%.
- Overall, visitors perceived themselves to have a very high level of well-being. The vast majority (>80%) also agreed that their park experiences contributed to multiple dimensions of well-being, and that they were satisfied with life.



- Compared to the entire sample, respondents from Cypress Hills Provincial Park and Kananaskis Country provincial recreation areas reported dramatically poorer mental health status and only a small proportion indicated that they had good to excellent mental health. This result was nearly the polar opposite of responses from Sir Winston Churchill Provincial Park and Miquelon Provincial Park visitors.
- Visitors reported engaging in an average of 7.3 different activities during their visit, consisting of 3.7 sedate activities, 2.6 active activities, and 1.0 educational activity.

## HEALTH AND WELL-BEING MOTIVATIONS TO VISIT ALBERTA'S PROTECTED AREAS

- The human health and well-being benefits that the visitors expected to receive from visits were perceived to be a major personal motivation in the choice to visit Alberta protected areas:
  - 69.2% of respondents evaluated all of the health and well-being indicators as an important motivation for the visit, while only 10.8% of the sample considered them not important.
  - The most important motivation factors identified by respondents were psychological and emotional well-being (89.1% of visitors ranked this important), social well-being (88.3%), physical well-being (80.3%), and environmental well-being (79.4%). The least important were economic well-being (43.3%), cultural well-being (50.1%), and occupational well-being (55.5%).
  - While occupational well-being was rated as a less important motivation, the results reveal that visitors are motivated to visit parks to recover from work-related stress. This speaks to the 'spillover effects' of nature, in that visitors are seeking restoration that potentially extends beyond their immediate experience.
  - Statistically significant differences in motivations by park location were evident in all factors, except economic and financial well-being.
  - Older visitors were more highly motivated for cultural, economic and spiritual well-being-related reasons. There was also a negative correlation between age and physical, psychological/emotional, and social well-being motivations; this means that older visitors were less motivated to visit protected areas for these reasons.
  - Females tended to rate financial, social, psychological/emotional and spiritual well-being motivations higher than males.
  - There was a positive correlation between income and education, and motivations to visit the parks for physical, psychological, and environmental well-being-related reasons.
  - Visitors were strongly motivated for health and well-being related reasons, irrespective of the length of visit (i.e., no differences between day users and campers were evident).



## HEALTH AND WELL-BEING BENEFITS (OUTCOMES) ASSOCIATED WITH EXPERIENCES PROVIDED BY ALBERTA'S PROTECTED AREAS

- The perceived benefits that visitors received from their protected areas experiences were substantial:
  - 67.8% of respondents indicated an improvement in health and well-being across all of the health and well-being indicators. Very few visitors considered any aspect of well-being to have worsened (2.3%).
  - The most frequently reported improvements were related to psychological and emotional (90.5%), social (85%), and physical well-being (77.6%). The least frequently reported improvements were in factors related to economic (42.6%) and cultural well-being (44.0%).
  - The perceived benefits, or actual outcomes, largely match the motivations for the visit.
  - Women perceived greater benefits than men associated with their visit, especially with respect to spiritual, social, psychological/emotional, and financial well-being.
  - The higher the income, the higher the perceived psychological and physical well-being benefits received.
  - Miquelon Provincial Park, and to a lesser extent Sir Winston Churchill Provincial Park, had consistently less improved physical, spiritual, ecological, cultural, and environmental well-being outcomes as compared to Cypress Hills Provincial Park and Kananaskis Country provincial recreation areas.
  - Older visitors perceived greater cultural, financial and economic well-being benefits, and lesser social, psychological, physical and occupational well-being benefits.
  - More frequent visitors tend to be of better physical health, and tend to perceive greater well-being benefits and outcomes associated with visiting protected areas.
  - Health and well-being benefits tend to go up with years since first visit, frequency of visit, perceived state of physical health, life satisfaction, number of active and sedate activities, and especially nature relatedness, and down with perceived stress level.
  - All but one of the health and well-being benefits for children were perceived as being important by more than 80% of visitors, with very few (<4%) viewing any benefit as not important.
  - Visitors consistently and strongly perceived visits to parks as important for child development, regardless of the protected area visited.



## PERSONAL COMMITMENT TO PARKS

- The study revealed a positive correlation between a high level of personal commitment to parks and a perceived improvement in health and well-being derived from visitation:
  - Position involvement (position involvement is evident when an individual's values or self-images are identified within a particular service provider; in this case parks and protected areas) had the highest correlation levels for both motivations and benefits, meaning that the more involved individuals are in parks, the more motivated they are to visit parks for health and well-being related reasons, and the greater health and well-being benefits they receive from park experiences.

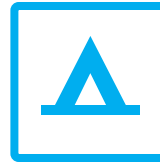
## NATURE CONNECTEDNESS

- Park visitors reported a strong subjective connection with nature. The mean level of nature relatedness for park users was higher than averages from community samples in other studies. This suggests park visitors had a strong affinity with the natural environment, a sense of identity that includes nature, and a desire to be outdoors in the wilderness.
- Health motivations and benefits (or outcomes) were correlated highly with nature relatedness, meaning the more connected one is to nature, the greater the motivation to visit parks and the greater the health and well-being benefits received from park experiences.
- Nature connectedness was positively correlated with older age, frequency of visits, perceived state of physical and mental health, and life satisfaction. Therefore, visits to protected areas contribute positively to perceived health and overall life satisfaction (happiness).
- Sir Winston Churchill Provincial Park visitors appeared somewhat more connected to nature compared to visitors to other protected areas included in the study.

## SELECTED RESEARCH NEEDS, AND STRATEGIC POLICY AND MANAGEMENT PROSPECTS

- Research findings substantiate the need for the Parks Division to better understand the health and well-being motivations of different social and population subgroups (e.g., youth, elderly, couples, etc.) in order to inform and develop policies and visitor experience programs in support of health and well-being related pursuits. Specifically, the Parks Division should:
  - consider developing a strategic and corporate "benefits-based management" policy or action plan, inclusive of human health and well-being benefits, to provide sufficient direction for planning and management.

# HEALTHY OUTSIDE/HEALTHY INSIDE



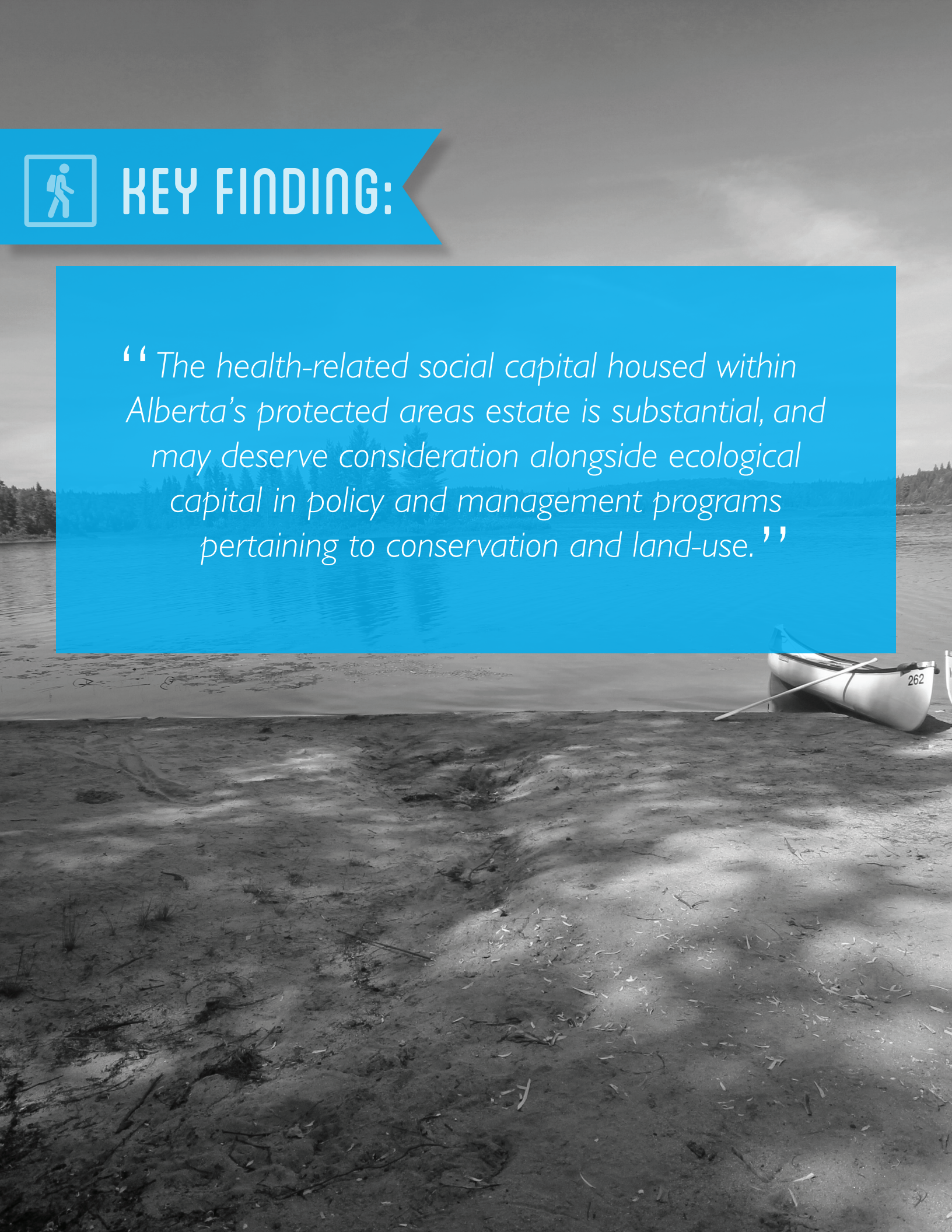
- consider developing an integrated and cooperative research and monitoring strategy/plan to detect and monitor trends and impacts of various park landscapes/features on human health and well-being.
  - consider strengthening its social science component in order to promote research to improve understanding, planning, management and decision-making for parks and protected areas and “benefits-based management”, including human health and well-being.
  - consider developing an education program/training protocol to address human health and well-being and related topics for all levels of park staff. Such training can greatly benefit staff in their daily work.
  - consider developing “best practice” guidelines to help facilitate experiences that enhance human health and well-being in their protected areas estate.
  - consider developing a unified health and well-being communications and branding theme with evidence-based messaging.
  - consider ongoing monitoring of visitors' perception of parks, and regular assessment of how frequency of visits impacts park users' connection with nature and well-being.
  - consider developing an outreach program focused on connecting, in particular, youth and new Canadians to nature. Results clearly revealed that more frequent visitors tend to be of better physical health, and perceive greater well-being benefits and outcomes associated with protected area visits. As non-park users may be unable to get to parks (i.e., due to physical constraints), and/or are unaware of the benefits, an outreach program can help support the benefits of ongoing park visitation.
  - more fully recognize the health and well-being benefits of parks and other forms of protected areas as part of the wider health promotion efforts of the Alberta government.
- Overall, the results of the study suggest that the health and well-being-related social capital housed within Alberta's protected areas estate is substantial, and may deserve consideration alongside ecological capital in policy and management programs pertaining to conservation and land-use. While research is necessary to confirm if these findings are applicable more broadly, we strongly recommend that the Department of Environment and Sustainable Resource Development strengthen its social science component and begin the process of cultivating a health and well-being ethos within the corporate culture and function of the Parks Division.





## KEY FINDING:

*“The health-related social capital housed within Alberta’s protected areas estate is substantial, and may deserve consideration alongside ecological capital in policy and management programs pertaining to conservation and land-use.”*







# Research Context

Just how dependent humans are on nature, and exactly what benefits can be gained through experiences in the natural world, are issues that have only begun to be investigated within diverse disciplines, ranging from the environmental sciences to social sciences, but particularly in psychology, medicine and public health. The extant literature that examines how humans relate to nature indicates that natural environments, including those housed within parks and other forms of protected areas, can play a vital role in enhancing human health and well-being, primarily through people's access to nature. It has been shown that nature is critical for psychological, emotional and spiritual health and well-being (Frumkin, 2001; Katcher and Beck, 1987; Roszak et al., 1995; Suzuki, 1997; Wilson, 1984; Wilson, 2001). Furthermore, several decades of 'shinrin-yoku' (forest bathing) research has demonstrated that exposure to nature reduces stress (i.e., heart rate, blood pressure) and improves immune system functioning (Tsunetsugu et al., 2010).

Despite this burgeoning body of evidence, the overall health potential of this interaction often remains unacknowledged and under-utilized by policy-makers (Maller et al., 2006; 2008). This situation presents a considerable paradox, since the first parks and protected areas were created over a century ago often with the perception that human contact with nature fosters psychological and physical well-being, and reduces the stresses associated with urban life (Jones and Wills, 2005).

However, there is increasing recognition that there is a positive link between leisure activities and health

improvement and promotion (Caldwell, 2005; Iso-Ahola and Mannell, 2004; Mannell 2007; Orsega-Smith et al., 2004; Payne, 2002). As Payne et al. (2006, p. 21) state, "the growing body of literature on the relationship between leisure engagement and health suggests that leisure can, under certain conditions, contribute to the physical, mental, social and spiritual dimensions of health". National park visitors in Australia, for instance, reported that opportunities to run, hike, rest, and enjoy nature in parks are important to their well-being (Wolf and Wohlfart, 2014). Interestingly, while visitors recognize that leisure in parks and protected areas is connected to their individual health and well-being, this important realization is only now emerging in the protected areas policy and management arena.

The research undertaken in selected Alberta parks that is reported in this report stresses the crucial role that parks and protected areas can play as a foundation for human health and well-being, especially through visitor experiences (most of which are for recreation and leisure purposes). In so doing, we consider parks and protected areas as providers of unique resources for promoting healthy behaviours and lifestyles, especially in (but not limited to) a leisure context.

In this report, "health" is understood as per the definition provided in the Ottawa Charter: "a resource for everyday living, which allows us to manage, to cope with and even change our environments" (World Health Organization, 1986). "Well-being", on the other hand, is conceived as "a state of successful, satisfying, and productive engagement with one's life, and the realization of one's full physical, cognitive, and social-



emotional potential” (Gil and Bedini, 2010, p. 17). The U.S. National Park Service defines park “health resources” as “programs, facilities, and environments (natural and cultural) that when used by visitors can provide demonstrable and often distinctive physical, mental, and social health benefits” (National Park Service, 2013, p. 2). This positive approach implicitly understands health and well-being as interdependent, linked concepts.

## THE ROLE OF PROTECTED AREAS FOR ENHANCING HUMAN HEALTH: THE NEED FOR EVIDENCE IN SUPPORT OF BENEFITS-BASED MANAGEMENT

Parks and other forms of protected areas make an important contribution to the conservation of biodiversity, the maintenance and enhancement of ecological integrity, and the delivery of essential ecosystem services like the provision of clean air and water. Beyond this, these areas protect critical habitat for species-at-risk, and maintain healthy, diverse, and resilient ecosystems upon which human health and well-being depends (Costanza et al., 1997; Dudley et al., 2011; Millennium Ecosystem Assessment, 2005; Naidoo et al., 2008). These areas also provide important spaces for human recreational use (Priskin and McCool, 2006; Stolton et al., 2010), and are important in economic terms; in the sense that they generate substantial, albeit often under appreciated, economic benefits (Dixon and Sherman, 1991; Pabon-Zamora et al., 2008). For example, a national study in Canada, in which all provincial, territorial, and national park agencies participated, determined that in 2009 a total of \$5.2 billion in combined direct spending by park agencies and visitors contributed \$4.6 billion to Canada’s Gross Domestic Product (GDP).

Of this, \$2.9 billion was labour income, which is equivalent to 64,000 full time jobs (Canadian Parks Council 2011). In Alberta, parks visitors spend \$1.1 billion annually (Government of Alberta, 2014). This generates a province-wide impact of \$1.2 billion and sustains more than 23,480 person-years of employment.

While it is increasingly acknowledged that parks and protected areas can provide a fundamental setting for promoting health and well-being for those that visit, live and work around these areas, this potential is not yet fully understood. Despite the popularity of parks as recreation and leisure spaces (Eagles et al., 2002), and the large potential for promoting protected areas as places that support human health and well-being, scant research exists on the diverse perceived health and well-being motivations and benefits associated with visitation (Stolton and Dudley, 2010). In particular, the health and well-being benefits received by population subgroups (e.g., youth and the elderly, men and women, impaired persons, etc.), as well as the potential policy and management interventions that could be developed and implemented to support an integrated approach to biodiversity conservation and human health and well-being, remain critical research gaps.

Despite the critical research gaps that exist within a protected areas context, research conducted primarily in the context of urban and suburban parks (in developed countries) suggests that the social benefits of visiting parks and other forms of protected areas are substantial. A comprehensive literature review conducted to improve understanding of how humans benefit from nature was carried out by Maller et al. (2008), and indicated that human health and well-being is enhanced by a range of different types of contact, such as viewing natural scenes, being in natural environments, having contact with plants, and having contact with animals. Importantly, most of these actions in nature are particularly well supported in parks and protected areas, mainly because they often provide a high quality (i.e. healthy) environment that is relatively high in ecological integrity, and that possesses good accessibility, as well as a range of infrastructure and services that support visitation (Eagles et al., 2002).

Outside of a parks and protected areas context, research has shown positive links between nature, outdoor recreation and human health (Dustin et al., 2009; Godbey, 2009; Health Council of the Netherlands and Dutch Council for Research on Spatial Planning



# HEALTHY OUTSIDE/HEALTHY INSIDE



Nature and the Environment, 2004; Keniger et al., 2013; Kuo, 2010; Lee and Maheswaran, 2011; Nilsson et al., 2007; Townsend and Weerasuriya, 2010). The most obvious include exposure to, and participation in, physical activities such as hiking, swimming, canoeing and other outdoor activities that encourage “green exercise” (Gladwell et al., 2013; Pretty, 2011), although the most common activities in parks are walking and cycling, due to their accessibility to the majority of population (de Vries et al., 2011). Several studies found that both the number of recreation facilities and the area of green space were significantly related to high levels of walking or physical activity amongst the local population (Kaczynski et al., 2008; Li et al., 2005).

In turn, contact with nature offers a range of health benefits to people, including: faster recovery from surgery (Ulrich, 1991), better pain control (Diette et al., 2003), reductions in and prevention of hypertension episodes, enhanced ability to concentrate (Kuo, 2001), fulfillment of emotional needs (Lopez-Mosquera and Sanchez, 2012), and lower self-reported stress (Frumkin, 2001; Kaplan, 1995; Kaplan and Kaplan, 1989; Lewis, 1996; Parsons et al., 1998). Even brief nature contact can promote positive moods, increase vitality, reduce depression, and encourage pro-social behaviour (Berman et al., 2012; Nisbet, Zelenski, & Murphy, 2011; Ryan et al., 2010; Weinstein, Przybylski, and Ryan, 2009). Furthermore, children with attention and behavioural disorders have shown significant improvement after being in contact with nature (Faber Taylor and Kuo, 2009; Frumkin, 2001; McCurdy et al., 2010). Such benefits can also contribute to a healthier family unit, as Ashbullby et al. (2013) found that engagement with beach environments improved the health of both children and parents.

It is important to recognize that it is not simply the activity, but also the environmental setting that shapes these positive outcomes. Indeed, research has shown that exercise is more beneficial, and leads to more substantial relief of anxiety and depression, when it

occurs in natural settings like parks, rather than in urban settings (Bodin and Hartig, 2003; Bowler et al., 2010; Hartig et al., 1991).

Interestingly, the psychological benefits realized in natural areas have also been shown to be higher in areas with greater biodiversity (Fuller et al., 2007). This finding is relevant given the primary conservation mandate of most protected areas in Canada, and because the level of biodiversity in parks and protected areas is higher than non-protected areas (Mulongoy and Chape, 2004). While intriguing, Lovell et al. (2014) state that even though a number of studies show a positive relationship



# HEALTHY OUTSIDE/HEALTHY INSIDE



between biodiversity and human health and well-being, there is still some uncertainty in this field. Research must therefore take into account the complexity and multidimensionality of any link between biodiversity and good health.

Because existing research has largely focused on urban and suburban parks, with very few studies having occurred within the specific context of national and provincial parks and protected areas (and none in Canada or Alberta), a prominent gap within the literature exists. Furthermore, most studies focused on the benefits associated with attention restoration and physical activity in natural environments, and ignored other aspects that influence both individual and collective health and well-being. First adopted by Maller et al. (2008), this overall perspective can be summarized around the contribution that parks and protected areas make to five different components of health and well-being (physical, mental, spiritual, social and environmental).

Despite advancing awareness of the inter-linkages between human health, well-being, and parks, most of the initiatives listed above have focused primarily on urban and suburban parks and, overall, very few place-based studies have been initiated within the specific context of protected areas in Canada. Indeed, no study on the health motives and outcomes from park visitation has been conducted in the context of Alberta's protected areas network. A prominent gap within both the literature and policy and practice, especially in Alberta, therefore exists.

The goal of this report is to establish the perceived human health and well-being motivations and benefits associated with visitation to, and participation in experiences provided by, Alberta's parks and protected areas. To support this goal, six related objectives were developed (below). The findings of this multi-year study conducted in 2012 and 2013 should be considered in light of these objectives.

## STUDY OBJECTIVES

1. To establish the perceived human health and well-being motivations of visitors to a sample of Alberta's parks and protected areas.
2. To establish the perceived human health and well-being benefits (outcomes) associated with visitation to, and by extension experiences provided by, parks and other forms of protected areas in Alberta.
3. To better understand how a visitor's personal commitment to parks correlates with perceived human health and well-being motivations and outcomes associated with visits to Alberta's parks.
4. To better understand how a visitor's perceived 'nature relatedness' correlates with perceived human health and well-being motivations and benefits associated with visits to Alberta's parks.
5. To better understand how various demographic attributes (e.g., age, gender) and visitation characteristics (e.g., frequency of visit, length of visit, activities participated in) correlate with perceived human health and well-being motivations and benefits associated with visits to Alberta's parks.
6. To provide evidence-based recommendations with respect to research, policy, planning and management related to protected areas and human health and well-being and benefits-based management more broadly.



# Methods

## CASE STUDY AREAS AND PROVINCIAL POLICY LANDSCAPE

There are currently 475 sites in Alberta's provincial protected areas system. These lands are administered under the *Provincial Parks Act*, the *Wilderness Areas, Ecological Reserves, Natural Areas and Heritage Rangelands Act* and the *Willmore Wilderness Park Act*. The strategic direction for Alberta's provincial parks system, *Alberta's Plan for Parks* (Government of Alberta, 2009), acknowledges the interconnectedness of the environmental, societal, and economic values of parks and the people of Alberta. Relevant to this research, it also recognizes parks as being important to Albertan's quality of life, and that responsible management of protected areas is essential if they are to support a high quality of life for both current and future generations.

Of the 475 protected areas that fall under one of eight classifications, the majority are Provincial Parks (75) and Provincial Recreation Areas (PRAs) (208). There are three interrelated desired outcomes for the Alberta provincial parks system: (1) People friendly communities and recreational opportunities; (2) Healthy ecosystems and environment; and, (3) Sustainable prosperity supported by our land and natural resources.

Similar to parks organizations across Canada and the world, the Parks Division adopted four high-level program goals that address the important role of the park system in (1) the conservation of biodiversity, (2) outdoor recreation, (3) environmental education, and (4) tourism. The objectives of Provincial Parks are thus

to protect a site's natural and cultural heritage and to support outdoor recreation, tourism and heritage appreciation activities that depend upon and are compatible with environmental protection. PRAs are also established under the *Provincial Parks Act* and are intended to accommodate a wide variety of outdoor recreation activities. They are generally smaller in land area and are managed with outdoor recreation as the primary objective, supporting a range of outdoor activities in natural, modified and 'manufactured' settings.

Survey sampling for this study took place in three provincial parks (Cypress Hills Provincial Park, Sir Winston Churchill Provincial Park, and Miquelon Lake Provincial Park) and three PRAs in the Kananaskis Country region (Elbow Falls, McLean Creek, and Elbow River) throughout the summer in 2012 and 2013 (Table 1; Figures 1 and 2).<sup>1</sup> These areas were selected in consultation with Edmonton and regional Parks Division staff based on a range of factors, including high summer season visitor numbers, class of protected area, and dispersion of sites throughout the province. We aimed to include sites with high visitation, as they would provide a reasonable sample size over a short surveying period. As we were also interested in whether or not results would vary depending on geographic location of the park within the province, we included sites in both the northern and southern portions of the province. Specifically, these areas represent a diversity of natural regions, have been established to protect different species, habitats, and landscapes, and offer a diversity of natural and manufactured activities and services to visitors. These differing attributes allow for a range of influencing factors to be included in the survey.

<sup>1</sup>52 PRAs are located in the Kananaskis Region.

Table 1: Setting description of case study locations.

KANANASKIS COUNTRY PRAs	CYPRESS HILLS PROVINCIAL PARK	SIR WINSTON CHURCHILL PROVINCIAL PARK	MIQUELON LAKE PROVINCIAL PARK
<b>PARK SIZE</b>			
<p><b>McLean Creek PRA:</b> 606.6 Acres/245.5 ha</p> <p><b>Elbow Falls PRA:</b> 236.3 Acres/95.6 ha</p> <p><b>Elbow River PRA:</b> 573.8 Acres/232.2 ha</p>	50,532.86 Acres/ 20,450.65 ha	1,636.26 Acres/ 662.17 ha	3,210.73 Acres/ 1,299.38 ha
<b>NATURAL REGION</b>			
Rocky Mountain - Montane Rocky Mountain - Sub-alpine	Rocky Mountain - Montane Grassland - Mixed grass	Boreal Forest - Dry mixed wood	Boreal Forest - Dry mixed wood
<b>NATURAL HERITAGE ASSETS</b>			
<ul style="list-style-type: none"> <li>• Provides habitat for a diverse number of species of local and regional importance (e.g., large ungulates – elk, moose, deer and carnivores – grizzly/black bears, cougar, wolves)</li> <li>• Forest cover is dominated by contiguous even aged lodgepole pine stands typically from a fire origin; white spruce and Englemann spruce are also common</li> </ul>	<ul style="list-style-type: none"> <li>• Provides habitat for over 200 bird species</li> <li>• Predominant forest cover is mixed forests and lodgepole pine</li> <li>• Provides habitat for a variety of wildlife species including moose, elk, white-tailed deer, mule deer, antelope, fox, porcupine and bobcat</li> <li>• Provides habitat for the threatened northern leopard frog and several species of plant and animal that are rare or uncommon in Alberta</li> <li>• The Cypress Hills Plateau is the highest plateau on the plains of western Canada</li> </ul>	<ul style="list-style-type: none"> <li>• Provides habitat for approximately 230 bird species</li> <li>• Forest cover is predominantly balsam fir; white spruce, white birch</li> <li>• Also contains 300 year old growth boreal forest</li> </ul>	<ul style="list-style-type: none"> <li>• Provides habitat for about 200 bird species annually</li> <li>• Forest cover is predominantly trembling aspen, balsam poplar and white spruce</li> </ul>
<b>TOTAL ANNUAL VISITATION (TOTAL CAMPERS ONLY - 2005/06 DATA)</b>			
89,758 (Elbow River PRA only)	68,693	8,974	45,099
<b>CLOSEST MAJOR URBAN CENTRE(S) (POP.)</b>			
Calgary (1,214,389) 67km	Medicine Hat (61,180) 170km	Lac La Biche (2,895) 12km Edmonton (812,201) 230km Fort McMurray (61,374) 302km	Camrose (17,286) 32 km Edmonton (812,201) 230km
<b>IUCN CLASSIFICATION &amp; SPECIAL DESIGNATIONS</b>			
N/A None	Category II Interprovincial Park (Alberta)	Category II Important Bird Area	Category II Important Bird Area



# HEALTHY OUTSIDE/HEALTHY INSIDE

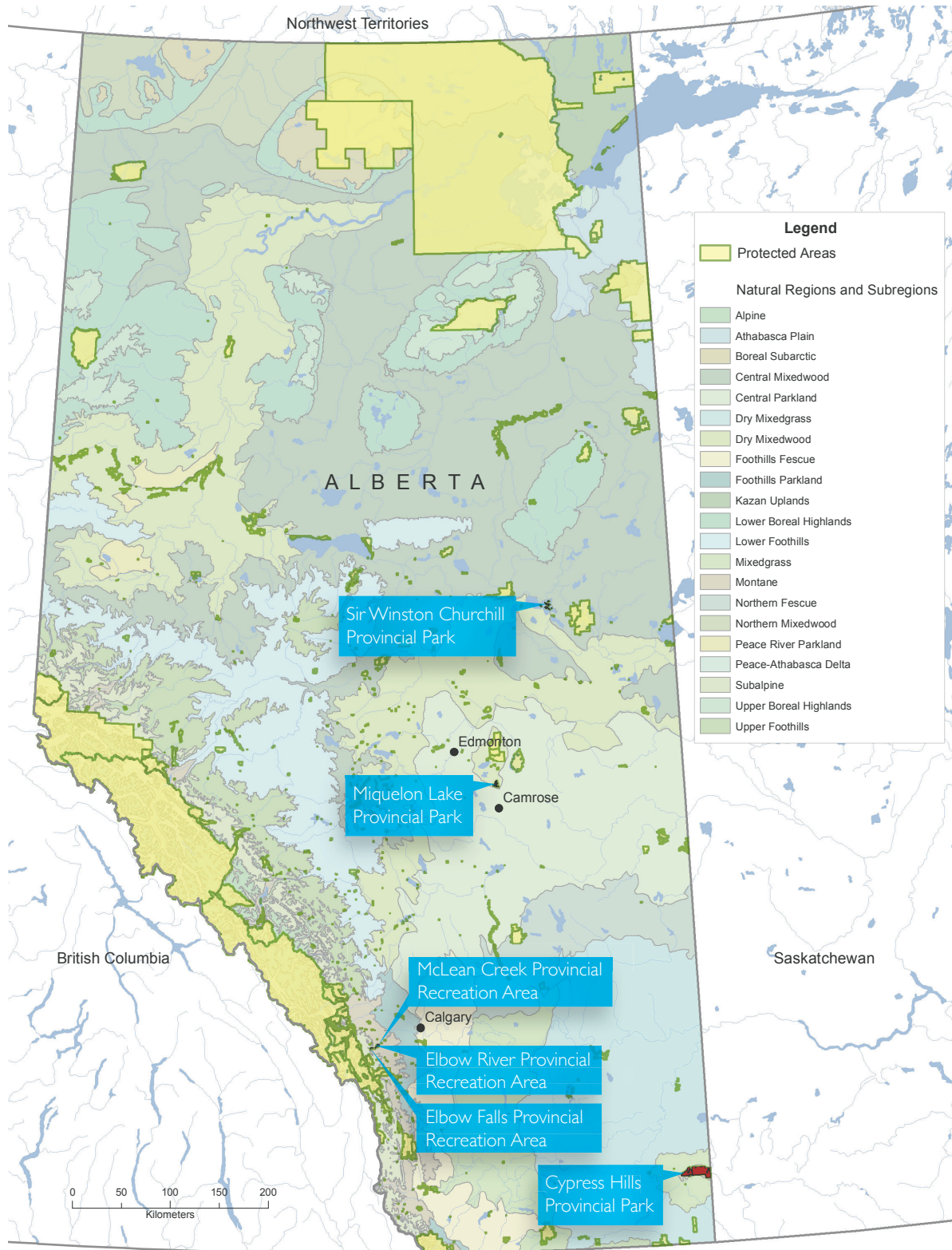


Figure 1: Case study locations in the geographical context of Alberta's federal and provincial protected areas network (Adapted from: Canadian Council on Ecological Areas, 2014).

# HEALTHY OUTSIDE/HEALTHY INSIDE

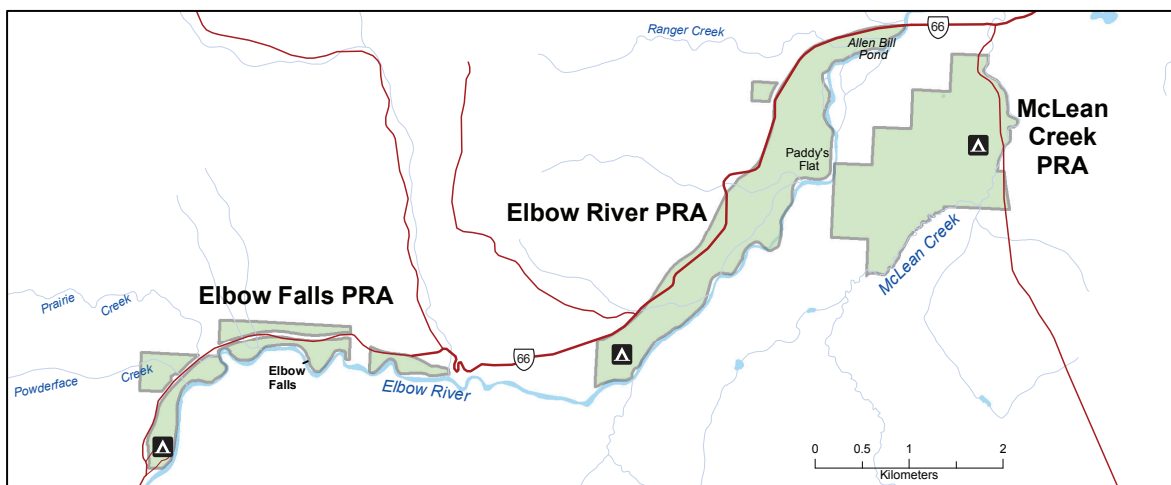
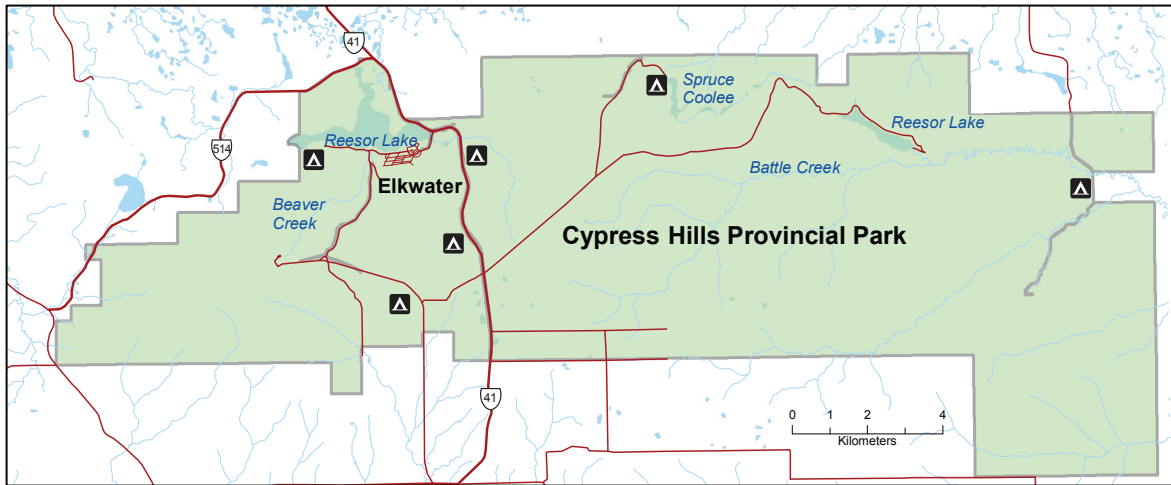
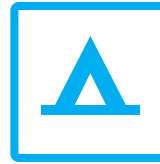


Figure 2: Inset maps of case study areas.



## QUESTIONNAIRE DESIGN AND ADMINISTRATION

Data were collected for this study using a self-administered visitor survey. The survey adopted a place-based, case study design to characterize systematically perceived health and well-being motives and benefits associated with visitor experiences at the four case study locations (Summer 2012: Cypress Hills Provincial Park and Kananaskis Country provincial recreation areas; Summer 2013: Sir Winston Churchill Provincial Park and Miquelon Lake Provincial Park). Following the methodology of Lemieux et al. (2012), a questionnaire grounded in several distinct, but complementary sets of literature, was developed to obtain the perceived health and well-being motivations and outcomes of visitors. These literatures included subjective well-being (Diener et al., 2009), population well-being (e.g., Bradshaw and Richardson, 2009; Foster and Keller, 2007), theory and research on human health, well-being and place (e.g., Eyles and Williams 2008; Manzo 2003; Muhajarine et al. 2008; Patterson and Williams 2005), and, most importantly, the extensive literature pertaining to: (1) the benefits received through recreation and leisure activities/experiences (e.g., Driver, 1983; Driver et al., 1991; Manfredo et al., 1996; Moore and Driver, 2005; Leahy et al., 2009; Wong et al., 2011) and; (2) the health benefits individuals receive through contact with nature, including parks (e.g., Driver, 2009; Maller et al., 2008; Manning, 2010; Miller and Foster, 2010; Russell et al., 2013, etc.). Note that this review did not include leisure and recreation constraints (e.g., Wilhelm-Stanis, et al., 2009).

Perception is an essential part of how people experience and use natural areas (Relph, 1976). Perception is dependent on the socio-cultural context in which the individual is immersed, as well as how their needs and wants are met during their visit to the natural area (Zube, 1987). Furthermore, recent studies have shown that the use and valuation of protected areas are determined not only by personal perceptions, but also by emotional attachment with the landscape (Williams

and Vaske, 2003) and satisfaction from the realization of personal values (Krenichyn, 2006). Indeed, the personal benefits obtained from visitation are the key element in societal acceptance and the approval of protected areas and their management (Bushell and Eagles, 2007).

Previous research has revealed multiple perceived motivations for visiting and participating in activities provided by protected areas, including satisfaction from the realization of personal values (Krenichyn, 2006; Manning, 2010; Manzo, 2003). Protected area values have been classified as: intrinsic (e.g., fauna, flora, ecosystems); on-site goods and services (e.g., clean air, clean water, scientific research and knowledge, education); community-oriented (e.g., culture, identity, economy, spiritual meaning, social well-being, bequest for future generations); and individual-oriented (e.g., existence, physical health, psychological health, spiritual well-being; Lockwood et al., 2006). While increasing attention has been paid to on-site goods and services of the natural environment in recent years (i.e., the value of ecosystem services and natural capital, e.g., Anielski and Wilson, 2009; Costanza et al. 1997; Howarth and Farber, 2002), less attention has been given to the community, social capital, and individual health benefits that visitors obtain from visitation to, and experiences provided by, protected areas. The questionnaire was thus developed to also address these critical research gaps.

The research adopted a positive approach to measuring health-related factors that we refer to as "health and well-being assets" (i.e., outcomes) rather than focusing solely on deficits (e.g., specific diseases). In so doing, the questionnaire included an extensive suite of health and well-being indicators (or attributes), including those that extend beyond the physical and psychological/emotional. In doing so this study understands health and well-being in a more holistic manner. Specifically, based on an extensive literature review, 11 health and well-being motivation and outcome attributes were measured. These attributes, their relevance to benefits provided by protected areas, and supporting literature are listed in Table 2.

Table 2: Dimensions of well-being and benefits provide to visitors by nature and protected areas.

	<b>PHYSICAL WELL-BEING</b>	<b>BENEFITS (EXAMPLES):</b>
<ul style="list-style-type: none"> <li>Physical well-being includes physical activity, nutrition, and self-care, and involves preventative and proactive actions that take care of one's physical body (Miller and Foster, 2010).</li> </ul>	<ul style="list-style-type: none"> <li>Provide areas for exercise (Driver, 1983; Driver et al., 1991)</li> <li>Provide areas to keep physically fit (Driver, 1983; Driver et al., 1991)</li> <li>Provide areas to relax physically (Driver, 1983; Driver et al., 1991)</li> </ul>	
	<b>EMOTIONAL WELL-BEING</b>	<b>BENEFITS (EXAMPLES):</b>
<ul style="list-style-type: none"> <li>Positive mental health is more than just the absence of illness; well-being is comprised of numerous components that allow individuals to cope with stress, develop positive relationships, and flourish in life. Positive functioning includes feeling satisfied with life (Diener, 2000) and a subjective sense of emotional, psychological, and social well-being (Keyes, 2002)</li> <li>There is some agreement that it is one's sense of expectation that positive outcomes result from the events and experiences of life</li> </ul>	<ul style="list-style-type: none"> <li>Restoration from mental fatigue (Kaplan and Kaplan, 1989; Ulrich et al., 1991; Rohde and Kendle, 1994; Herzog et al., 1997; Maller et al., 2008)</li> <li>To experience solitude, quiet &amp; tranquility (Maller et al., 2008; Driver, et al. 1991)</li> <li>Stress reduction and lower levels of sadness (More and Payne, 1978; Godbey and Blazey, 1983; Driver, 1991)</li> <li>The longer people stay at a park, the less stressed they report feeling (Hull and Michael, 1995)</li> <li>Exposure to nature promotes positive moods, and vitality (Nisbet and Zelenski, 2011; Ryan et al., 2010)</li> </ul>	
	<b>SOCIAL WELL-BEING</b>	<b>BENEFITS (EXAMPLES):</b>
<ul style="list-style-type: none"> <li>Social well-being encompasses the degree and quality of interactions with others, the community, and nature (Miller and Foster, 2010)</li> <li>Durlak (2000) includes peer acceptance, attachments/bonds with others and social skills (communication, assertiveness, conflict resolution) as fundamental to social well-being</li> </ul>	<ul style="list-style-type: none"> <li>Provide settings for people to meet formally and informally for recreational or leisure pursuits (e.g. family togetherness, being with friends/similar people/new people) (Driver et al., 1991; Maller et al., 2008)</li> <li>Foster a sense of belonging/sense of place/community and provide a sense of integration rather than isolation (Driver, et al., 1991; Maller et al., 2008)</li> </ul>	
	<b>ENVIRONMENTAL WELL-BEING</b>	<b>BENEFITS (EXAMPLES):</b>
<ul style="list-style-type: none"> <li>Environmental well-being is a broad dimension that considers an individual's reciprocal interaction with the environment</li> <li>Includes the balance between home and work life, and the individual's relationship with nature and community resources</li> </ul>	<ul style="list-style-type: none"> <li>Provide areas to foster involvement in the natural environment / facilitate a connection to something beyond human concerns (Maller et al., 2008)</li> <li>Visiting parks provides financial and in-kind support that can assist conservation and improvement of the natural values of parks (Maller et al., 2008)</li> </ul>	
	<b>CULTURAL WELL-BEING</b>	<b>BENEFITS (EXAMPLES):</b>
<ul style="list-style-type: none"> <li>Cultural well-being is the set of distinctive spiritual, material, intellectual, and emotional features of society: it encompasses, in addition to art and literature, lifestyles, ways of living together, values systems, traditions and beliefs (UNESCO Declaration on Cultural Diversity, 2001)</li> <li>Cultural wellness is being aware of one's own cultural background, as well as the diversity and richness present in other cultural backgrounds</li> </ul>	<ul style="list-style-type: none"> <li>Cultural values of protected areas can refer to the values that different cultures place on natural features of the environment that have great meaning and importance to them (IUCN, 2014)</li> <li>The intrinsic benefits and satisfactions to be gained from exposure to and involvement with culture</li> <li>A symbol of (national and/or self) identity (IUCN, 2014)</li> <li>The vitality that communities and individuals enjoy through participation in recreation, creative and cultural activities; the freedom to retain, interpret and express their arts, history, heritage and traditions</li> </ul>	
	<b>SPIRITUAL WELL-BEING</b>	<b>BENEFITS (EXAMPLES):</b>
<ul style="list-style-type: none"> <li>Spiritual values of protected areas refer to the transcendent or immanent significance that features of nature have that put people in touch with a deeper reality greater than themselves that gives meaning and vitality to their lives and motivates them to revere and care for the environment (IUCN, 2014)</li> </ul>	<ul style="list-style-type: none"> <li>Provide areas to develop personal, spiritual values (e.g. contemplation, reflection and inspiration) (Driver et al., 1991; Maller et al., 2008; Heintzman, 2013)</li> <li>Enable people to gain a fresh perspective on life, and think about personal values (Driver, et al., 1991; Ward Thompson et al. 2005; Cordell et al. 1998; Martin 1996; Kaplan and Kaplan 1989)</li> </ul>	



Table 2 Continued: Dimensions of well-being and benefits provide to visitors by nature and protected areas.



## INTELLECTUAL WELL-BEING

- Intellectual well-being is the degree to which one engages in creative and stimulating activities, as well as the use of resources to expand knowledge and focus on the acquisition, development, application, and articulation of critical thinking (Miller and Foster, 2010)
- It also represents the abilities to achieve a more satisfying life (e.g., personal growth, education, achievement) (Hettler, 1980; Renger et al., 2000)
- Includes acquisition, use, sharing, and application of knowledge in a creative and critical fashion

## BENEFITS (EXAMPLES):

- Provide learning experiences via interpretive opportunities and unique environments for personal study
- To develop [your/my] knowledge of things [here/there] (Driver, 1983; Driver et al., 1991)
- To discover something new (Driver, 1983; Driver et al., 1991)
- To learn more about nature (Driver, 1983; Driver et al., 1991)
- To study nature (Driver, 1983; Driver et al., 1991)
- To gain a better appreciation of nature (Driver, 1983; Driver et al., 1991)



## ECOLOGICAL WELL-BEING

- Ecological well-being refers to how effectively one deals with or manages environmental influences on one's life and one's own impact on the environment (WHO, 2005)
- Living sustainably creates environments and supports behaviors that satisfy psychological needs: high life satisfaction is related to engagement in ecologically sustainable behaviors and significantly lower ecological footprints (Brown and Kasser, 2005)

## BENEFITS (EXAMPLES):

- Parks provide opportunities to engage in ecologically responsible behaviours; a metaphor for personal transformation and growth, enhancing psychological well-being (Shapiro, 1995) and fostering harmonious human-nature relationships (Grouzet and Lee, 2014)
- Observing native animals, having them nearby, or interacting with them improves quality of life (Tribe and Brown, 2000; Howard and Jones, 2000)
- Visiting parks is consistent with living in an ecologically sustainable way



## OCCUPATIONAL WELL-BEING

- Occupational well-being is the level of satisfaction and enrichment gained by one's work and the extent one's occupation allows from the expression of values (Hettler, 1980; Anspaugh et al., 2004)
- This includes work history, patterns and balance between vocational and leisure activities, and vocational goals (Croese et al., 1992).

## BENEFITS (EXAMPLES):

- Provide areas to get away from the usual demands of life (Driver, 1983)
- Provide areas to rest awhile from the feeling of being overloaded at home or work (Driver, 1983)
- Viewing nature improves performance in attention demanding tasks (Tennessen and Cimprich, 1995)
- Contact with nature reduces perceived job stress, improves job satisfaction, and reduce the incidence of reported illness and headaches of office workers (Kaplan and Kaplan, 1989; Maller et al., 2008)



## ECONOMIC WELL-BEING

- Economic well-being is about not being prevented by economic disadvantage from achieving their full potential in life (DFES, 2003: 6-7)
- Economic well-being determine people's consumption possibilities and their command over resources (OECD, 2013)

## BENEFITS (EXAMPLES):

- Nature attracts consumers and tourists to business districts, and is seen to increase appeal (Maller et al., 2008)
- Parks and natural features attract businesses (Maller et al., 2008)
- Parks and nature tourism generate employment in regional areas (Maller et al., 2008)

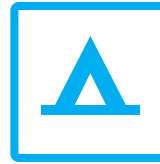


## FINANCIAL WELL-BEING

- Financial well-being is a mind-set or perspective in relation to one's goals - and a piece of mind that all their plans are in line with their core values of what is important in their lives
- Financial stress is not dependent on income but on whether one is able to meet his/her economic responsibilities (Aldana and Liljenquist, 1998)/it is influenced by psychological and physical needs
- Lack of financial well-being may cause social, physical and emotional stress (Hendrix et al., 1987; Bagwell, 2000)

## BENEFITS (EXAMPLES):

- Ability to live within financial means
- Provide opportunity to use resources effectively
- Parks are an affordable recreation/leisure option



As the literature review above stresses, contact with nature can enhance children's health and well-being. This group was isolated for analysis given the lack of data pertaining to the developmental benefits of Alberta's parks and protected areas, and the importance of this cohort in terms of future park usage. Accordingly, adult respondents were asked to comment on the benefits of park experiences for children. Participants were asked to assess the perceived benefit of visiting parks for seven child development attributes, including: 1) physical development, 2) social knowledge and competence, 3) cognitive learning and language, 4) anxiety issues, 5) hyperactivity/inattention issues, 6) personal-social behaviour, and 7) respiratory issues.

Demographic questions about the visitors age, sex, place of residence, annual household income, quality of life, and highest level of education completed were included in the survey. Visit characteristics included length of stay, type of travel group (i.e., single, couple, family), numbers in travel group, and activities undertaken (e.g., camping, hiking, reading, canoeing, etc.). We conducted in-person surveys using tablet computers and traditional pen-and-paper, with a representative sample of visitors at each site. To enhance respondent diversity, we distributed the surveying effort at each location both spatially and temporally. More specifically, we surveyed visitors on over 20 different days between July 1 and Labour Day (September) at each site, evenly spreading the surveying effort throughout the day (morning, afternoon, and evening blocks) and week (weekdays and weekend days) and with consideration of visitor needs (e.g., meals, arrival and departure activities).

Potential respondents over 18 years of age were approached systematically at various visitor use zones at each site (e.g., campsites, trails, beaches, visitor centres, day use/group use areas, and interpretive displays), on a next available basis, meaning the next adult and the researcher were ready to continue with surveying. In some instances, visitors were provided with the opportunity to participate in the study by taking the survey away and returning the survey to park staff at a later time. After a brief introduction to the survey

(e.g., purpose, ethics approval, why their participation is important), the visitor was invited to participate in the survey using a tablet computer. If the visitor was not willing to participate, we recorded the date and location, and reason for the refusal. Visitors' participation was voluntary and all participants were informed about their anonymity and the confidentiality of the survey. Potential respondents were approached only once. The questionnaire was completed on-site using iSurveysoft's iSurvey, an Apple® iPad™ and Google® Android™ survey application software for tablet computers. Questionnaire results were merged and formatted for analysis using IBM SPSS Statistics version 21.

Respondents were asked to provide responses to items on a predetermined list of health-related visitor motivations for the current park visit and health-related outcomes from that visit. Questionnaire responses were coded as follows. Visitor motivations for visiting each protected area were measured with 11 items (season 1) or 10 items (season 2) assessing diverse motivations (e.g., physical well-being, psychological/emotional well-being, social well-being, etc.) on a 7-point Likert-type response scale (not at all important = 1, not important = 2, somewhat not important = 3, neutral = 4, somewhat important = 5, important = 6, very important = 7). Each respondent was asked to choose the appropriate scale level for each visitor motivation. Health and well-being benefits (i.e. outcomes of visitation) derived from visiting the protected areas were measured with a set of questions assessing the extent to which participants perceived that park visitation affected various aspects of their well-being (e.g., physical well-being, psychological/emotional well-being, social well-being, etc.), measured again on a 7-point Likert-type response scale (greatly worsened = 1, worsened = 2, somewhat worsened = 3, neutral = 4, somewhat improved = 5, improved = 6, greatly improved = 7). Benefits for children (e.g. physical development, social knowledge, etc.) were assessed through valuing each attribute on a 7-point Likert-type scale (disagree strongly = 1, to agree strongly = 7). Each respondent was asked to choose the appropriate scale level for each visit outcome.



The Satisfaction With Life Scale (Diener et al., 1985) was used to measure subjective well-being, or an indicator of happiness. Participants responded to five statements concerning their life satisfaction on a Likert scale ranging from 1 (strong disagreement) to 6 (strong agreement). The scale also included a 'neither agree or disagree' option. Statements included "In most ways my life is close to my ideal" and "So far, I have gotten the important things I want in life". Items were averaged to produce a life satisfaction score with higher scores indicative of greater happiness. Finally, respondent Body Mass Index (BMI) was calculated using height and weight recordings to measure body fat. The BMI is used in a wide variety of contexts as a simple method to assess how much an individual's body weight departs from what is normal or desirable for a person of his or her height.

## METHODOLOGICAL DIFFERENCES BETWEEN SURVEYING SEASONS

The majority of questions and measurement approaches for the questionnaire used in the first surveying season (July, August and September, 2012) were retained for use in the second surveying season (July, August and September, 2013), with some changes made for the second season, as indicated below.

In the first surveying season, the project team elected to examine how Visitor Commitment to parks affected motivations and benefits received from park experiences. Psychological commitment is representative of a person's attitude toward an activity, service or standard (Pritchard et al., 1999), whereas behavioural loyalty is an outcome of commitment reflecting both people's attitudes and behaviours towards an activity, service or stand (Backman and Crompton, 1991).

Visitor commitment to parks was assessed through 12 statements that were valued from 1 (strongly disagree) to 5 (strongly agree). The statements were developed using the Psychological Commitment Instrument (Pritchard et al., 1999). The instrument establishes four

antecedent processes of persons' commitment (and loyalty) to services or places (in this case, parks and other forms of protected areas) by assessing a person's:

1. Resistance to change (resistance to change can be driven by a desire to avoid dissonance regarding what one believes or feels about a particular service);
2. Position involvement (position involvement is evident when an individual's values or self-images are identified within a particular service provider);
3. Informational complexity (informational complexity is how knowledgeable an individual is about a particular service provider); and,
4. Volitional choice (volitional choice is the ability to make decisions freely and in the absence of constraints).

For each of these antecedent processes, three statements specifically related to parks visitation were included in the questionnaire with the objective of obtaining a better understanding of the commitment / loyalty levels of park visitors and how they relate to health and well-being motivations and benefits (see Table 11 for the full list). This instrument is a useful marketing tool for categorizing groups or individuals that may be considered more committed or loyal to a product or service. Furthermore, it has proven useful and informative in other leisure contexts, including, for example, examining recreationist commitment to alpine skiing under climate change, and overall loyalty to a recreation-based agency (e.g., Iwasaki and Havitz, 2004; Dawson et al., 2011).

For the second surveying season, the visitor commitment component of the research (above) was replaced in favour of measuring a visitor's Nature Relatedness; in order to obtain a better understanding of how a visitor's subjective connection with nature relates to health and well-being motivations and benefits (or outcomes). Studies have shown that connectedness with nature



is an important component of overall well-being (Cervinka et al., 2012; Nisbet et al., 2011; Tam 2013) and can be a primer to pro-environmental behaviours (Gosling and Williams, 2010; Nisbet et al., 2009). People who have a strong sense of nature relatedness are more likely to travel to parks than those with a weaker connection (Lin et al., 2014). Interestingly, such findings suggest that nature connectedness may help deepen sustainability thinking (Mayer and Frantz, 2004), but can also help to explain specific land management practices, including those associated with conservation (Gosling and Williams, 2010).

Visitor connections to the protected areas were measured using selected items from the nature relatedness scale (Nisbet et al., 2009; Nisbet and Zelenski, 2013), which were adapted for this study. Although several related instruments exist, a brief reliable measure of nature relatedness can be achieved with six items, limiting potential response fatigue (Nisbet & Zelenski, 2013). The nature relatedness construct also provides a broader measure than other instruments because it captures affective, cognitive and physical aspects of the human-nature relationship (Nisbet et al., 2009; Nisbet and Zelenski, 2013). Nature connectedness was measured using a set of questions assessing the extent to which participants agreed or disagreed with the following 6 items:

- 1) My ideal vacation spot would be a remote, wilderness area;
- 2) I always think about how my actions affect the environment;
- 3) My connection to nature and the environment is a part of my spirituality;
- 4) I take notice of wildlife wherever I am;
- 5) My relationship with nature is an important part of who I am; and,
- 6) I feel very connected to all living things and the Earth.

The assessment was measured on a 5-point Likert-type response scale (disagree strongly = 1, to agree strongly = 5).

Other relatively minor revisions included the removal of the 'financial well-being' attribute used to gauge both visitor motivations and outcomes for the second season of surveying due to poor factor loading in the first surveying season, and the addition of current country and province of residence (if in Canada) and length of residency for the second surveying season. The second season survey is included in Appendix A.

## IMPORTANT NOTES PERTAINING TO NATURE RELATEDNESS AND SATISFACTION WITH LIFE RESULTS REPORTING

Please note that if readers wish to report on either the Satisfaction With Life Scale or the nature relatedness findings discussed here, it is important to report the *average score* across all questions only. While scores for the individual questions may contain information that is valuable to managers and health practitioners, it is important to note that each individual question only captures part of the respective constructs. Only reporting the *overall mean*, for all scale items combined, fully captures the nature relatedness and satisfaction with life constructs.





## KEY FINDING:

*“Visitors’ well-being outcomes from park visits tend to be higher when they visit more frequently and when they have a longer standing relationship with a particular area. Alternatively, people with higher levels of well-being tend to visit parks and stay longer. Overall, this suggests that park visits are positively affecting visitors’ physical and mental health, as reported by the visitors themselves.”*



Miquelon Lake Provincial Park







# Results

Overall, 1,515 adults completed the survey, including 289 in Cypress Hills (“Cypress”), 345 in Kananaskis Country PRAs (“Kananaskis”), 449 in Sir Winston Churchill (“Churchill”), and 432 in Miquelon Lake (“Miquelon”). A total of 18 respondents were excluded from analysis because they identified themselves as under the age of 18, and one other subject was excluded because they were a resident of the park rather than a visitor to it. The survey response rate was over 98%. This high response rate is attributed largely to innovations in on-site survey administration, in particular the inclusion of tablet computers as a survey response option. Consistent with recent research findings on innovations in survey administration (Davis et al., 2012), we found that park visitors enjoyed taking in-person, on-site surveys using this digital medium, and consistently elected to use tablets over traditional paper-and-pen surveys. Importantly, in addition to garnering higher than average response rates than online and mail surveys, tablet computer use has also been shown to be more cost efficient for large survey samples (>1,300) (Davis et al., 2012).

## DEMOGRAPHIC AND VISIT CHARACTERISTICS

Demographic and visit characteristics of the overall sample and of each park location are presented in Tables 3 and 4. Compared to 2011 population level statistics for the Province of Alberta (Statistics Canada 2014), study participants had significantly higher levels of education (26.0% had university bachelors degrees vs. 14.5% in population; 9.5% had university graduate degrees vs. 6.4% in population), and were slightly more likely to be female (54.8% vs. 49.9%). The mean sample

age of 42.9 years is higher than the median age of the Alberta population (35.9) years, but much closer to the mean age of only those aged 18+ (45.2). A large proportion of the sample brought children on their park visit (52.7%), with a mean of 1.5 accompanying children. Finally, participants had an average BMI of 26.3 (over 25 is considered overweight; over 30 is considered obese) and were almost exclusively residents of Canada (only 1.5% were non-residents).

A comparison of this study to other recent studies and surveys indicates that the sample we obtained is highly representative of the population of visitors to Alberta’s parks and protected areas. According to several extant sources, including the 2010 Camper Satisfaction Survey (Government of Alberta, 2010), the Survey of Albertans’ Priorities for Provincial Parks Report (The Praxis Group, 2008) and the 2008 Alberta Recreation Survey (Alberta Tourism Parks and Recreation, 2008), 93% of visitors to Alberta’s protected areas are from Alberta (our sample = 93%), the average camping size is 3.1 (our sample = 3.5), 33% are first time visitors (our sample = 35.7%), and the majority of visitors visit the same park repeatedly (our sample = 64.3% repeat visitors, with an average of 5.2 visits in the last year). Beyond this, the average length of stay is 3 nights (our sample = 3.6), and the most frequent activities are day hiking, photography and wildlife viewing (all identified as frequent activities participated in, as per discussion below). Finally, Albertans with relatively high incomes and high levels of education are more likely to use provincial parks. As noted above, our sample had significantly higher levels of education than the Alberta population.



Table 3: Categorical analysis of socio-demographic and visit characteristics by site.

Socio-Demographic Characteristics		Location									
		Cypress		Kananaskis Country		Churchill		Miquelon		Total	
		Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
<b>Gender</b>	Male	142	(50.0%)	170	(50.6%)	195	(43.6%)	169	(39.5%)	676	(45.2%)
	Female	142	(50.0%)	166	(49.4%)	252	(56.4%)	259	(60.5%)	819	(54.8%)
<b>Education</b>	No university degree	191	(68.2%)	168	(50.8%)	283	(64.0%)	313	(73.5%)	955	(64.6%)
	Bachelor degree	59	(21.1%)	99	(29.9%)	135	(30.5%)	91	(21.4%)	384	(26.0%)
	Graduate degree	30	(10.7%)	64	(19.3%)	24	(5.4%)	22	(5.2%)	140	(9.5%)
<b>Employment status</b>	Employed <sup>1</sup>	226	(80.1%)	276	(82.9%)	373	(84.0%)	336	(79.2%)	1211	(81.7%)
	Unemployed <sup>2</sup>	10	(3.5%)	9	(2.7%)	7	(1.6%)	26	(6.1%)	52	(3.5%)
	Not in the labour force	46	(16.3%)	48	(14.4%)	64	(14.4%)	62	(14.6%)	220	(14.8%)
<b>Total household income</b>	Less than \$10,000	7	(2.8%)	12	(4.1%)	3	(0.7%)	9	(2.4%)	31	(2.3%)
	\$10,000- \$29,999	8	(3.2%)	15	(5.1%)	17	(4.2%)	14	(3.8%)	54	(4.1%)
	\$30,000- \$49,000	24	(9.5%)	28	(9.5%)	27	(6.7%)	32	(8.6%)	111	(8.4%)
	\$50,000- \$69,999	28	(11.1%)	41	(13.9%)	42	(10.5%)	42	(11.3%)	153	(11.6%)
	\$70,000- \$89,000	51	(20.2%)	43	(14.6%)	62	(15.5%)	47	(12.6%)	203	(15.4%)
	\$90,000- \$109,000	44	(17.4%)	26	(8.8%)	60	(15.0%)	59	(15.8%)	189	(14.3%)
	\$110,000 - \$129,999	29	(11.5%)	37	(12.5%)	80	(20.0%)	52	(13.9%)	198	(15.0%)
	\$130,000 - \$149,999	19	(7.5%)	28	(9.5%)	20	(5.0%)	37	(9.9%)	104	(7.9%)
	\$150,000 - \$169,999	23	(9.1%)	15	(5.1%)	29	(7.2%)	31	(8.3%)	98	(7.4%)
\$170,000 or more	20	(7.9%)	50	(16.9%)	61	(15.2%)	50	(13.4%)	181	(13.7%)	
<b>Accompanying Children &lt;17?</b>	No	160	(55.7%)	216	(63.9%)	174	(38.8%)	161	(37.4%)	711	(47.3%)
	Yes	127	(44.3%)	122	(36.1%)	274	(61.2%)	270	(62.6%)	793	(52.7%)
<b>Live in Canada</b>	No					7	(1.6%)	6	(1.4%)	13	(1.5%)
	Yes	Not asked		Not asked		441	(98.4%)	425	(98.6%)	866	(98.5%)
<b>How long lived in Canada?</b>	Entire life					384	(93.0%)	360	(86.5%)	744	(89.7%)
	Other	Not asked		Not asked		29	(7.0%)	56	(13.5%)	85	(10.3%)
<b>Duration of park visit</b>	One day or less	77	(26.6%)	289	(84.5%)	97	(21.7%)	104	(24.2%)	567	(37.6%)
	More than one day	212	(73.4%)	53	(15.5%)	351	(78.3%)	326	(75.8%)	942	(62.4%)
<b>First visit to park</b>	No	167	(57.8%)	261	(76.1%)	245	(54.6%)	297	(69.4%)	970	(64.3%)
	Yes	122	(42.2%)	82	(23.9%)	204	(45.4%)	131	(30.6%)	539	(35.7%)

<sup>1</sup> Work for pay or in self-employment

<sup>2</sup> Without paid work or without self-employment work, and available for work

Table 4: Means analysis of socio-demographic and visit characteristics by park location.

Socio-Demographic Characteristics	Location									
	Cypress		Kananaskis Country		Churchill		Miquelon		Total	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
<b>Age</b>	43.4	(13.0)	43.1	(14.2)	41.9	(12.5)	43.5	(13.3)	42.9	(13.2)
<b>Body Mass Index</b>	26.3	(5.4)	25.1	(4.6)	26.8	(5.4)	26.6	(5.9)	26.3	(5.4)
<b># of accompanying children</b>	0.9	(1.2)	1	(4.3)	1.8	(2.6)	2	(7.4)	1.5	(4.7)
<b>Duration of park visit (# days)</b>	3.6	(2.9)	1.8	(3.7)	4.2	(4.5)	4.3	(5.5)	3.6	(4.5)
<b>Years since first visit</b>	20	(16.0)	16	(13.0)	7	(12.0)	12	(14.0)	12	(14.0)
<b>Frequency of park visit in past 12 months</b>	5.3	(13.0)	7.8	(13.3)	6.2	(17.4)	2.3	(2.2)	5.2	(12.6)
<b>Frequency of visit to all parks in last year</b>	12.4	(26.9)	12.7	(24.7)	8.2	(11.6)	9	(18.2)	10.2	(20.3)





Table 4 reveals that the average age of the entire sample population is 42.9 years, the mean BMI is 26.3, and the average number of accompanying children is 1.5. At 3.6 days, the average duration of the park visit is relatively long, as is the duration since the first visit (12 years), which suggests a long-term visitation pattern. The frequency of the visits to the current park in the past 12 months is 5.2, suggesting high levels of park use. The frequency of visits to all parks in the last year is also high at 10.2, revealing high levels of repeat park use. Overall, these data describe a sample population that is middle-aged, slightly overweight, that has a small number of accompanying children, and that has been using the reported park (and other parks) at high levels for a long period of time. Interestingly, with the exception of age and country of residence, statistical tests (Chi-square in the case of Table 15; Paired t-tests in the case of Table 16) revealed highly significant differences in almost all sample and visit characteristics across park locations (p-values all <0.05).

## Demographic highlights include:

- A slightly higher proportion of females in Sir Winston Churchill and Miquelon Lake, versus a 50-50 gender split in Cypress Hills and Kananaskis Country;
- A somewhat more highly educated sub-population in Kananaskis Country;
- A slightly higher proportion of middle incomes, and lower proportion of high incomes, in Cypress Hills;
- A very similar mean age in all parks (42.9), that has considerable variability (standard deviation of 13.2);
- A slightly lower BMI for visitors to Kananaskis Country; and,
- Double the number of accompanying children in Sir Winston Churchill and Miquelon Lake (about 2), versus Cypress Hills and Kananaskis Country (about 1).

## Visit characteristic highlights include:

- Much shorter visit durations in Kananaskis Country (mean 1.8 days, and only 15.5% multi-day visitors), versus other protected areas (mean 3.6-4.3 days, >73% multi-day visitors);
- A longer duration of years since respondent's first visit in Cypress Hills and Kananaskis Country vs. Sir Winston Churchill and Miquelon Lake;
- Considerable variability in proportions of first-time visitors, with a low of 23.9% in Kananaskis Country and high of 45.4% in Sir Winston Churchill); and
- Much lower frequency of total visits within the last year in Miquelon Lake (2.3) versus other parks (>5.3).

These findings reveal that each park has a relatively unique set of demographic and visit characteristics. This is an important finding as it shows market segmentation is occurring. It will be a challenge for park managers to take these findings into account in the delivery of program information and opportunities.

## PERCEIVED HEALTH AND QUALITY OF LIFE

Each respondent reported on his or her state of physical health, mental health, and perceived stress. Self-reported perceived states of health by respondents in each park are presented in Table 5. Overall, 52.4% and 42% of the total sample reported being in very good-to-excellent physical and mental health, respectively, which is much lower than similar values for the Alberta population (62.1% and 72.9% respectively) (Statistics Canada, 2014). The percent of respondents reporting being under extreme or quite a bit of stress prior to visit (34.7%) was also higher than the population value (23.9%). Respondents seem to be showing a somewhat diminished level of self-reported physical and mental health, and somewhat elevated level of stress, compared to the overall Alberta population. It is thus important to consider whether park vacations are a chosen method for improving health and lowering stress.

# HEALTHY OUTSIDE/HEALTHY INSIDE



Within this overall picture, statistical tests (Chi-square test) revealed several significant differences in respondent’s self-perceived state of physical and mental health across park locations ( $p < 0.00$ ), but no significant differences in their stress levels ( $p = 0.59$ ). By far the most prominent differences concerned perceived state of mental health, wherein Cypress Hills and Kananaskis Country respondents reported dramatically poorer mental health. Indeed, there were very few reports of good-excellent mental health, which was nearly the polar opposite of findings for Sir Winston Churchill and Miquelon Lake. In fact, the percent of Sir Winston Churchill and Miquelon Lake respondents that reported very good-excellent mental health was much closer to the Alberta population value of 72.9% (see Table 5). With respect to physical health, Kananaskis Country respondents reported a somewhat higher perceived state of physical health. Finally, self-reported life satisfaction by respondents in each park is presented in Table 6. Overall, respondents are relatively happy, with a global sample mean of 5.38 on the Life Satisfaction scale that ranges from 1 (less satisfied) to 7 (more satisfied).

### SUMMARY OF DEMOGRAPHICS AND VISIT CHARACTERISTICS BY PROTECTED AREA

Overall, the Sir Winston Churchill sample was distinct in that more respondents were females, more brought children, fewer were long-standing visitors, more were first-time visitors, fewer were repeat visitors, and most reported positive mental health. The Miquelon Lake sample contained more females, more respondents with children, fewer long standing visitors, more repeat

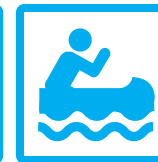
visitors, and respondents with very good mental health. The Cypress Hills sample contained respondents with somewhat lower incomes and fewer children, more long-standing visitors, more first-time visitor (thus fewer repeat visitors), and worse mental health. Finally, the Kananaskis Country sample had slightly more educated respondents with slightly lower BMIs, fewer children, more long standing visitors, more repeat visitors, and higher levels of physical health, but poorer mental health. Interestingly, the age profile of visitors across parks was very similar, as was perceived happiness.

### VISITOR ACTIVITIES

The survey asked respondents to indicate, from a list, which activities they participated in during their current visit. Visitors to Alberta protected areas participate in a wide variety of activities, including those that can be classified as active, sedate, and educational (see Table 7). The most commonly reported physically active activities were hiking (64.2% of visitors), swimming/ beach activities (46.5%), and walking (46.2%). Common educational activities included photography (25.9%), and visiting natural features (25%). Common sedate activities included simple resting/relaxing (88.4%), driving (46.6%), campfires (38.4%), cooking (37.8%), and socializing (37.7%). Interestingly, few substantive differences in activity types were evident by park location, except for the very obvious, such as low rates of swimming, camping, or motoring activities where the physical/natural features or facilities to support such activities do not exist.

Table 5: Perceived state of health by park location.

	Perceived state of physical health						Perceived state of mental health				Perceived stress level prior to visit							
	Poor		Fair-Good		Very Good-Excellent		Poor		Fair-Good		Very Good-Excellent		Extreme-Quite Stressful		A bit-Not Very		Not at all stressful	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Cypress Hills	1	(0.3%)	147	(50.9%)	141	(48.8%)	62	(21.5%)	208	(72.2%)	18	(6.3%)	104	(36.0%)	165	(57.1%)	20	(6.9%)
Kananaskis Country	1	(0.3%)	130	(38.0%)	211	(61.7%)	83	(24.2%)	243	(70.8%)	17	(5.0%)	107	(31.3%)	211	(61.7%)	24	(7.0%)
Churchill	5	(1.1%)	213	(47.5%)	230	(51.3%)	4	(0.9%)	134	(30.0%)	309	(69.1%)	164	(37.0%)	253	(57.1%)	26	(5.9%)
Miquelon	15	(3.5%)	206	(47.9%)	209	(48.6%)	6	(1.4%)	134	(31.3%)	288	(67.3%)	146	(34.2%)	252	(59.0%)	29	(6.8%)
<b>Total</b>	22	(1.5%)	696	(46.1%)	791	(52.4%)	155	(10.3%)	719	(47.7%)	632	(42.0%)	521	(34.7%)	881	(58.7%)	99	(6.6%)



This variety of visitor activities is illustrated further in Table 7, which shows that overall visitors reported engaging in an average of 7.3 different activities, including 3.7 sedate, 2.6 active, and 1 educational activity. While activities were generally similar across locations, there were notably fewer active and sedate activities in Kananaskis Country. Note however, that this does not consider the time spent on these activities, only that they were participated in for at least 10 minutes.

## PERCEIVED HEALTH AND WELL-BEING MOTIVATIONS

This section of the report illustrates respondents' reported health-related motivations for visiting each site. A substantial 69.2% of the sample evaluated the health and well-being indicators as a 'somewhat important', 'important', or 'very important' motivation for their visit, while only 10.8% of the sample considered them 'not at all important', 'not important',

Table 6: Perceived life satisfaction by park location (n=1,515).

or 'somewhat not important' (see Table 8). Overall, the most important motivating factors were psychological and emotional well-being (89.1% of visitors ranked this important), social well-being (88.3%), physical well-being (80.3%) and environmental well-being (79.4%). The least important factors were economic well-being (43.3%), cultural well-being (50.1%), and occupational well-being (55.5%). While statistically significant differences in motivations were evident across park locations for all factors except economic and financial well-being, the magnitude of these differences was relatively modest in most cases (<10% differences). One exception here is perhaps the much higher motivating influence of ecological well-being in Kananaskis Country, and much lower influence of this factor in Miquelon. The statistical differences found show that the sample size was large enough that relatively small differences in the ratings can be revealed as significant.

	Disagree		Neither Agree or Disagree		Agree	
	Count	(%)	Count	(%)	Count	(%)
<b>In most ways my life is close to my ideal</b>						
Cypress Hills	42	(14.5%)	23	(8.0%)	224	(77.5%)
Kananaskis Country	44	(13.0%)	38	(11.2%)	256	(75.7%)
Churchill	53	(11.9%)	34	(7.6%)	359	(80.5%)
Miquelon	52	(12.2%)	38	(8.9%)	336	(78.9%)
Total	191	(12.7%)	133	(8.9%)	1175	(78.4%)
<b>The conditions of my life are excellent</b>						
Cypress Hills	28	(9.7%)	23	(8.0%)	238	(82.4%)
Kananaskis Country	27	(8.1%)	37	(11.0%)	271	(80.9%)
Churchill	43	(9.7%)	44	(9.9%)	358	(80.4%)
Miquelon	43	(10.0%)	33	(7.7%)	352	(82.2%)
Total	141	(9.4%)	137	(9.2%)	1219	(81.4%)
<b>I am satisfied with life</b>						
Cypress Hills	21	(7.3%)	8	(2.8%)	259	(89.9%)
Kananaskis Country	20	(6.0%)	20	(6.0%)	295	(88.1%)
Churchill	26	(5.9%)	24	(5.4%)	393	(88.7%)
Miquelon	34	(8.0%)	28	(6.6%)	365	(85.5%)
Total	101	(6.8%)	80	(5.4%)	1312	(87.9%)
<b>So far I have gotten the important things I want in life</b>						
Cypress Hills	17	(5.9%)	12	(4.2%)	259	(89.9%)
Kananaskis Country	24	(7.1%)	14	(4.1%)	301	(88.8%)
Churchill	18	(4.1%)	23	(5.2%)	403	(90.8%)
Miquelon	32	(7.5%)	29	(6.8%)	367	(85.7%)
Total	91	(6.1%)	78	(5.2%)	1330	(88.7%)
<b>If I could live my life over, I would change almost nothing</b>						
Cypress Hills	68	(23.6%)	21	(7.3%)	199	(69.1%)
Kananaskis Country	69	(20.3%)	30	(8.8%)	241	(70.9%)
Churchill	89	(20.1%)	38	(8.6%)	316	(71.3%)
Miquelon	86	(20.1%)	39	(9.1%)	303	(70.8%)
Total	312	(20.8%)	128	(8.5%)	1059	(70.6%)





## KEY FINDING:

*“ Cypress Hills and Kananaskis Country respondents reported dramatically poorer mental health... there were very few reports of good-excellent mental health, which was nearly the polar opposite of findings for Sir Winston Churchill and Miquelon Lake.”*



# HEALTHY OUTSIDE/HEALTHY INSIDE



Table 7: Activity engagement by protected area.

Types of Activities Engaged in (at least 10 minutes)	(MET) <sup>1</sup>	Location									
		Cypress		Kananaskis Country		Churchill		Miquelon		Total	
		Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
<b>Active events</b>											
Hiking - self-guided walks	5.3	181	(62.6%)	214	(62.0%)	299	(66.6%)	278	(64.4%)	972	(64.2%)
Swimming / wading / beach activities	3.5	155	(53.6%)	41	(11.9%)	329	(73.3%)	180	(41.7%)	705	(46.5%)
Walking	3.5	134	(46.4%)	185	(53.6%)	198	(44.1%)	183	(42.4%)	700	(46.2%)
Bicycling	7.5	85	(29.4%)	85	(24.6%)	103	(22.9%)	100	(23.1%)	373	(24.6%)
Using playground facilities	5.8	56	(19.4%)	26	(7.5%)	118	(26.3%)	111	(25.7%)	311	(20.5%)
Fishing	3.5	39	(13.5%)	30	(8.7%)	103	(22.9%)	33	(7.6%)	205	(13.5%)
Motorboating/waterskiing/jet skiing/motorcycling	3.5	17	(5.9%)	6	(1.7%)	111	(24.7%)	25	(5.8%)	159	(10.5%)
Recreation & leisure activities outside of the park	2.5	23	(8.0%)	20	(5.8%)	41	(9.1%)	46	(10.6%)	130	(8.6%)
Canoeing / Kayaking	3.5	33	(11.4%)	16	(4.6%)	55	(12.2%)	14	(3.2%)	118	(7.8%)
Hiking - guided walks	5.3	27	(9.3%)	16	(4.6%)	24	(5.3%)	38	(8.8%)	105	(6.9%)
Misc Physical Activity (e.g. snowshoeing, golfing)	4.5	9	(3.1%)	15	(4.3%)	14	(3.1%)	17	(3.9%)	55	(3.6%)
Horseback riding	3.8	7	(2.4%)	8	(2.3%)	4	(0.9%)	6	(1.4%)	25	(1.7%)
Sailing / windsurfing	3	1	(0.3%)	1	(0.3%)	3	(0.7%)	3	(0.7%)	8	(0.5%)
<b>Education/special events</b>											
Photographing	2.5	66	(22.8%)	129	(37.4%)	111	(24.7%)	86	(19.9%)	392	(25.9%)
Visiting natural features / lookouts	2.5	76	(26.3%)	112	(32.5%)	113	(25.2%)	77	(17.8%)	378	(25.0%)
Nature study - wildlife (e.g. birdwatching)	2.5	69	(23.9%)	54	(15.7%)	88	(19.6%)	71	(16.4%)	282	(18.6%)
Nature study - plants (e.g. identifying wildflowers)	2.5	36	(12.5%)	37	(10.7%)	55	(12.2%)	45	(10.4%)	173	(11.4%)
Visiting historical / cultural features	3.5	59	(20.4%)	23	(6.7%)	38	(8.5%)	38	(8.8%)	158	(10.4%)
Attending visitor education / interpretive programs	2.5	51	(17.6%)	7	(2.0%)	32	(7.1%)	40	(9.3%)	130	(8.6%)
<b>Sedate/relaxing events</b>											
Resting / relaxing	1	256	(88.6%)	237	(68.7%)	424	(94.4%)	423	(97.9%)	1340	(88.4%)
Driving for sightseeing / pleasure	2.5	192	(66.4%)	135	(39.1%)	230	(51.2%)	149	(34.5%)	706	(46.6%)
Campfire	2.5	116	(40.1%)	81	(23.5%)	201	(44.8%)	184	(42.6%)	582	(38.4%)
Cooking	2	115	(39.8%)	85	(24.6%)	188	(41.9%)	185	(42.8%)	573	(37.8%)
Socializing	1.8	98	(33.9%)	142	(41.2%)	157	(35.0%)	174	(40.3%)	571	(37.7%)
Reading	1.3	109	(37.7%)	69	(20.0%)	175	(39.0%)	154	(35.6%)	507	(33.5%)
Listening to music	1.3	73	(25.3%)	40	(11.6%)	136	(30.3%)	141	(32.6%)	390	(25.7%)
Camping	2.5	129	(44.6%)	81	(23.5%)	61	(13.6%)	70	(16.2%)	341	(22.5%)
Camping (RV or camper)	2.5	Not asked		Not asked		159	(35.4%)	141	(32.6%)	300	(19.8%)
Watching television / playing (video) games	1.3	19	(6.6%)	13	(3.8%)	46	(10.2%)	54	(12.5%)	132	(8.7%)
Special events (e.g., festival)	2.5	12	(4.2%)	7	(2.0%)	40	(8.9%)	23	(5.3%)	82	(5.4%)
Playing music (with a musical instrument)	2	6	(2.1%)	7	(2.0%)	21	(4.7%)	23	(5.3%)	57	(3.8%)

<sup>1</sup> Metabolic Equivalent of Task. Based on codes from <https://sites.google.com/site/compendiumofphysicalactivities/tracking-guide>  
Some categories had no exact equivalent in the compendium, and so an estimate was made based on like activities

When examined by demographic variables, some interesting correlations were revealed. With respect to age, the data revealed that older visitors were more highly motivated for cultural, economic and spiritual well-being-related reasons. On the contrary, there was a negative correlation between age and physical, psychological/emotional and social well-being motivations, meaning that older individuals showed lower levels for these particular motivations. Regarding sex, females tended to rate financial, social, psychological/emotional and spiritual well-being motivations higher than males. With respect to income and education, there was a positive relation between high levels of income and education, and physical, psychological and environmental well-

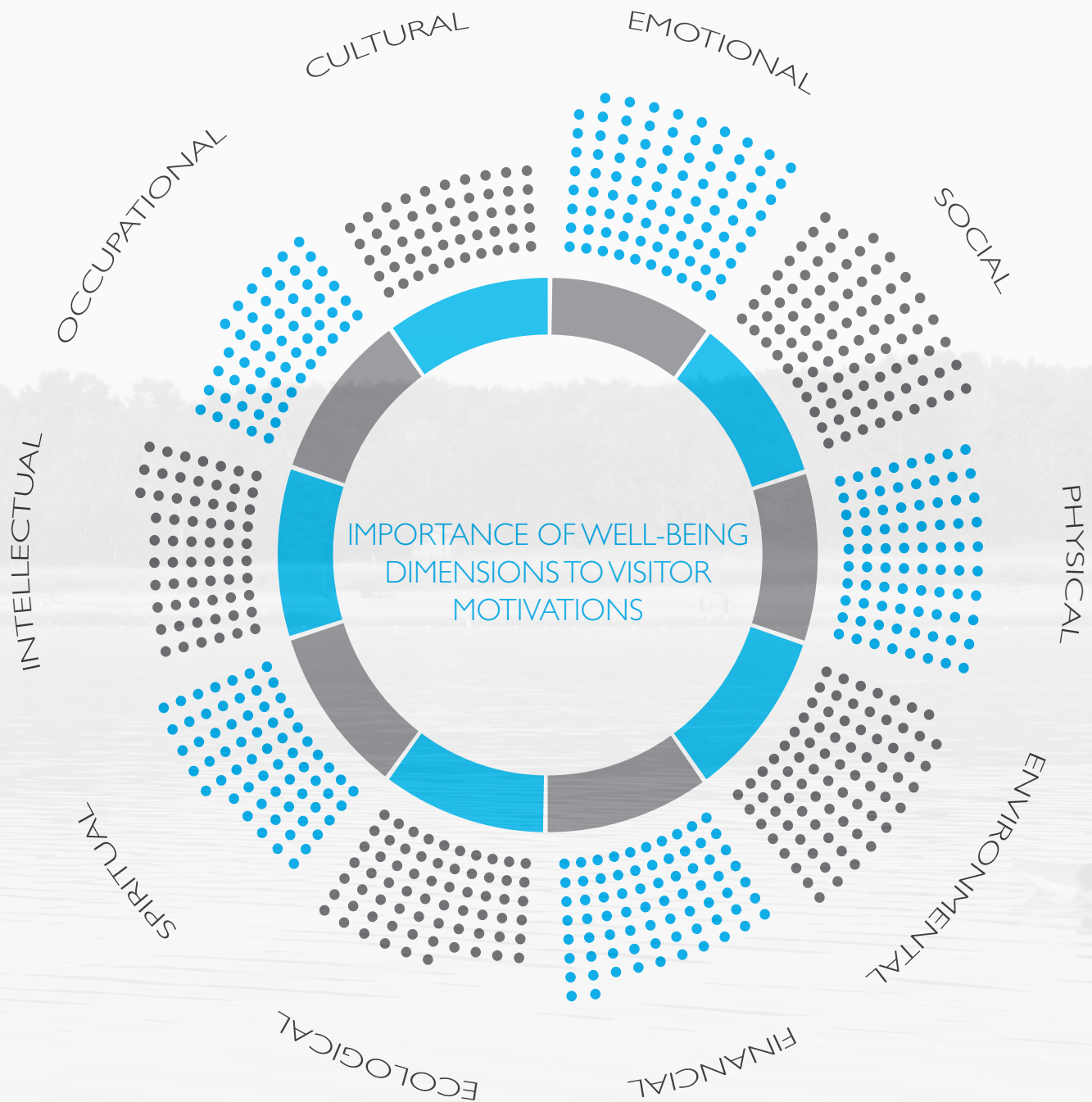
being. Conversely, income and education were negatively related to perceived financial and economic well-being motivations.

## PERCEIVED HEALTH AND WELL-BEING BENEFITS (OUTCOMES)

In addition to the motivations, visitors were asked to reveal the perceived well-being outcomes from their visit. When examining the entire sample, 67.8% of respondents perceived a certain health and well-being improvement associated with their visit (i.e. 'somewhat improved', 'improved', or 'greatly improved') across all the health and well-being attributes included in the



# WELL-BEING MOTIVATIONS



Under each well-being dimension, **a single point represents 1%** of the total sample that deemed that dimension as an **important motivation** to visit Alberta's parks and protected areas. Please note that the total percent has been rounded to the nearest integer, and that the economic well-being dimension is not show because it was collected in only one survey season.



# HEALTHY OUTSIDE/HEALTHY INSIDE



Table 8: Health and well-being motivation importance ratings, by protected area.

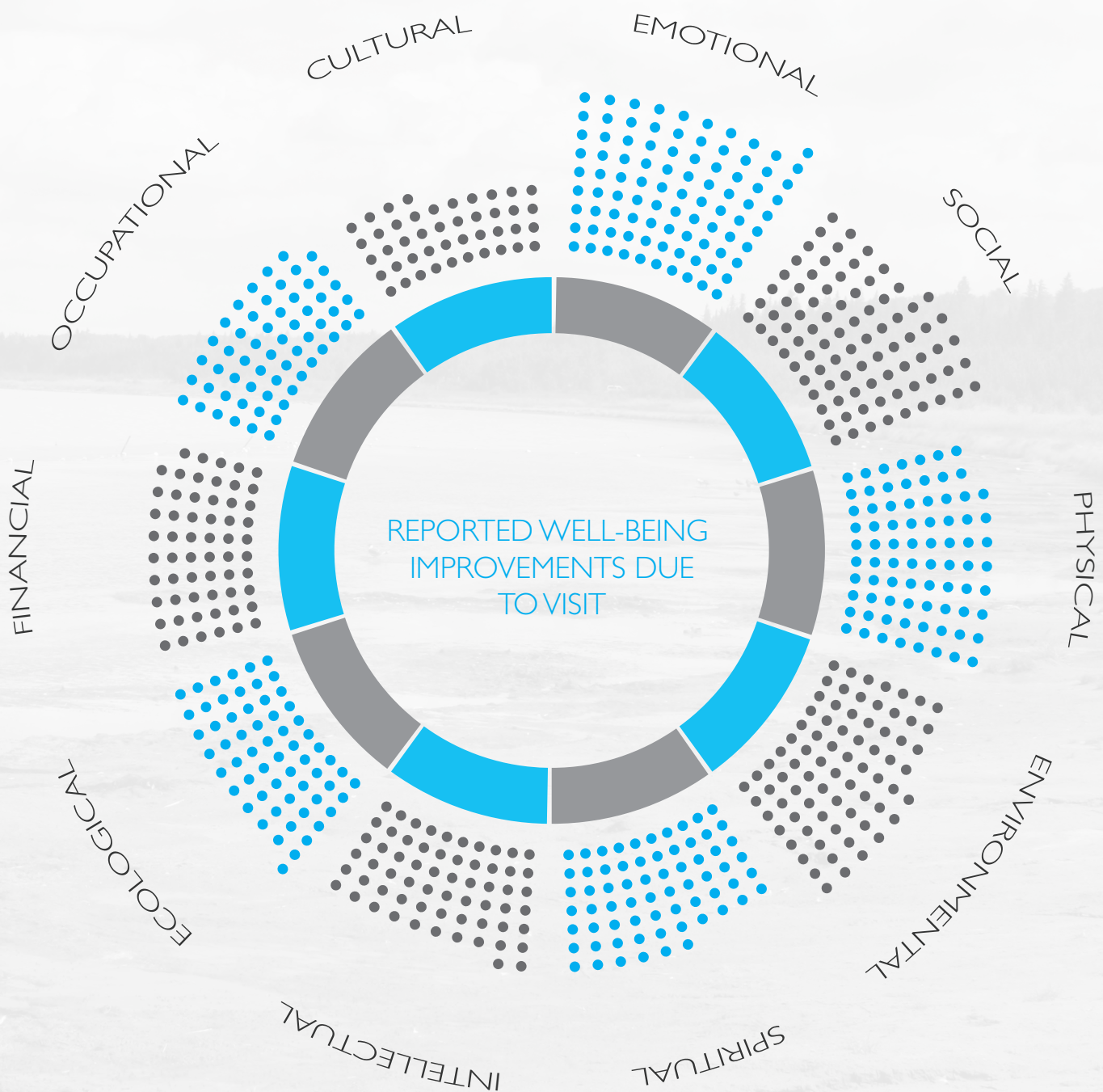
Motivation	Not important		Neutral		Important	
	Count	(%)	Count	(%)	Count	(%)
<b>Physical Well-being</b>						
Cypress Hills	16	(5.6%)	29	(10.2%)	240	(84.2%)
Kananaskis Country	22	(6.4%)	29	(8.5%)	292	(85.1%)
Churchill	34	(7.6%)	47	(10.5%)	367	(81.9%)
Miquelon	46	(10.7%)	74	(17.2%)	309	(72.0%)
<b>TOTAL</b>	118	(7.8%)	179	(11.9%)	1208	(80.3%)
<b>Psychological &amp; Emotional Well-being</b>						
Cypress Hills	11	(3.8%)	13	(4.5%)	262	(91.6%)
Kananaskis Country	12	(3.5%)	12	(3.5%)	319	(93.0%)
Churchill	17	(3.8%)	33	(7.4%)	398	(88.8%)
Miquelon	21	(4.9%)	46	(10.7%)	363	(84.4%)
<b>TOTAL</b>	61	(4.0%)	104	(6.9%)	1342	(89.1%)
<b>Social Well-being</b>						
Cypress Hills	20	(7.1%)	26	(9.2%)	237	(83.7%)
Kananaskis Country	6	(1.8%)	22	(6.5%)	313	(91.8%)
Churchill	16	(3.6%)	29	(6.5%)	402	(89.9%)
Miquelon	21	(4.9%)	35	(8.1%)	374	(87.0%)
<b>TOTAL</b>	63	(4.2%)	112	(7.5%)	1326	(88.3%)
<b>Intellectual Well-being</b>						
Cypress Hills	33	(11.8%)	67	(24.0%)	179	(64.2%)
Kananaskis Country	25	(7.4%)	79	(23.4%)	234	(69.2%)
Churchill	65	(14.5%)	109	(24.4%)	273	(61.1%)
Miquelon	49	(11.4%)	121	(28.3%)	258	(60.3%)
<b>TOTAL</b>	172	(11.5%)	376	(25.2%)	944	(63.3%)
<b>Spiritual Well-being</b>						
Cypress Hills	34	(11.9%)	43	(15.0%)	209	(73.1%)
Kananaskis Country	36	(10.7%)	47	(13.9%)	255	(75.4%)
Churchill	65	(14.6%)	112	(25.2%)	268	(60.2%)
Miquelon	66	(15.3%)	116	(27.0%)	248	(57.7%)
<b>TOTAL</b>	201	(13.4%)	318	(21.2%)	980	(65.4%)
<b>Ecological Well-being</b>						
Cypress Hills	27	(9.6%)	44	(15.7%)	209	(74.6%)
Kananaskis Country	21	(6.2%)	37	(10.9%)	283	(83.0%)
Churchill	66	(14.7%)	108	(24.1%)	274	(61.2%)
Miquelon	66	(15.3%)	135	(31.4%)	229	(53.3%)
<b>TOTAL</b>	180	(12.0%)	324	(21.6%)	995	(66.4%)
<b>Cultural Well-being</b>						
Cypress Hills	65	(23.2%)	56	(20.0%)	159	(56.8%)
Kananaskis Country	68	(20.2%)	99	(29.4%)	170	(50.4%)
Churchill	90	(20.1%)	130	(29.0%)	228	(50.9%)
Miquelon	94	(21.9%)	144	(33.5%)	192	(44.7%)
<b>TOTAL</b>	317	(21.2%)	429	(28.7%)	749	(50.1%)
<b>Environmental Well-being</b>						
Cypress Hills	18	(6.4%)	29	(10.3%)	234	(83.3%)
Kananaskis Country	16	(4.7%)	18	(5.3%)	308	(90.1%)
Churchill	44	(9.9%)	67	(15.1%)	334	(75.1%)
Miquelon	36	(8.4%)	81	(18.8%)	313	(72.8%)
<b>TOTAL</b>	114	(7.6%)	195	(13.0%)	1189	(79.4%)
<b>Occupational Well-being</b>						
Cypress Hills	76	(27.0%)	73	(25.9%)	133	(47.2%)
Kananaskis Country	89	(26.3%)	78	(23.1%)	171	(50.6%)
Churchill	73	(16.3%)	97	(21.7%)	277	(62.0%)
Miquelon	70	(16.4%)	109	(25.5%)	248	(58.1%)
<b>TOTAL</b>	308	(20.6%)	357	(23.9%)	829	(55.5%)
<b>Economic Well-being</b>						
Cypress Hills	76	(27.1%)	81	(28.9%)	123	(43.9%)
Kananaskis Country	98	(29.2%)	94	(28.0%)	144	(42.9%)
Churchill						
Miquelon	Not asked		Not asked		Not asked	
<b>TOTAL</b>	174	(28.2%)	175	(28.4%)	267	(43.3%)
<b>Financial Well-being</b>						
Cypress Hills	34	(11.9%)	55	(19.3%)	196	(68.8%)
Kananaskis Country	42	(12.4%)	64	(18.9%)	232	(68.6%)
Churchill	51	(11.5%)	68	(15.3%)	326	(73.3%)
Miquelon	39	(9.1%)	69	(16.1%)	321	(74.8%)
<b>TOTAL</b>	166	(11.1%)	256	(17.1%)	1075	(71.8%)

questionnaire (see Table 9). This suggests that the perceived benefits, or actual outcomes, largely match the motivations for the visit. Accordingly, outcomes followed a somewhat similar pattern to motivations, suggesting that visitors were able to actualize the implicit purpose of their visit. Overall the most improved factors were psychological and emotional well-being (90.5% of visitors), social well-being (85%), and physical well-being (77.6%). The least improved factors were economic well-being (42.6%) and cultural well-being (44.0%). Note also that very few visitors considered any aspect of well-being to have worsened (2.3%). Unlike motivations, perceived well-being benefits differed by park location. In particular, Miquelon Lake, and to a lesser extent Sir Winston Churchill had consistently less improved physical, spiritual, ecological, cultural, and environmental well-being outcomes compared to Cypress Hills and Kananaskis Country.

When examining demographics, the perceived benefits analysis shared many similarities with the motivations analysis, especially with respect to the influence of age and sex (see Table 16). Although the strength of the correlations was lower than found in the motivations analysis, age had a high positive correlation with cultural, financial and economic well-being, and a negative correlation with social, psychological, physical and occupational well-being. In the case of sex, women perceived greater benefits associated with their visit than men, specifically with respect to spiritual, social, psychological/emotional and financial well-being. In the case of income and education, several key differences were revealed. Higher income individuals noted higher perceived benefits in terms of psychological and physical well-being, but tended to perceive lower intellectual and financial well-being benefits. Finally, higher levels of education were correlated with higher levels of perceived physical and ecological well-being benefits, while a negative correlation between education level and intellectual, economic, financial and occupational well-being benefits emerged within the data.

All but last two Chi-Square test statistically significant (p<0.05)

# WELL-BEING OUTCOMES



Under each well-being dimension, **a single point represents 1%** of the total sample that deemed that **well-being outcome** to have improved as a result of their visit to Alberta's parks and protected areas. Please note that the total percent has been rounded to the nearest integer; and that the economic well-being dimension is not show because it was collected in only one survey season.



## BENEFITS TO CHILDREN

The survey asked respondents to comment on the perceived benefits that children received from a park visit. Results revealed substantial perceived health and well-being benefits associated with children's visits to the case study protected areas across the entire suite of developmental attributes included in the study (see Table 10). All but one of the benefits was viewed as being important by over 80% of visitors, with very few (<4%) viewing any benefit as not important. One exception was the benefit to respiratory related illness, which was deemed as important by only 69.4% of visitors. This conflicting finding could be the result of an asthma related issue in some children, where the problem can be aggravated by contact with outdoor pollen and molds.

Interestingly, statistical analyses revealed no significant differences in perceived benefits for children by park location (and thus are not shown in the table), suggesting that children were viewed to benefit equally from all park types. Furthermore, perceived benefits received by children did not vary significantly by the age of respondents. Notably, females rated all benefits for children significantly higher than males, especially with respect to anxiety, personal-social behaviour, and social competence and knowledge. Regarding household income levels, a positive correlation with the physical development of children was revealed. In other words, visitors with higher incomes perceived greater benefits for children. Education was also positively correlated with both anxiety issues and cognitive learning and language (see Table 10).

Table 9: Perceived health and well-being benefits (outcomes), by protected area.

Outcomes	Worsened		Neutral		Improved	
	Count	(%)	Count	(%)	Count	(%)
<b>Physical Well-being</b>						
Cypress Hills	0	(0.0%)	52	(18.3%)	232	(81.7%)
Kananaskis Country	1	(0.3%)	53	(15.7%)	284	(84.0%)
Churchill	5	(1.1%)	88	(19.8%)	352	(79.1%)
Miquelon	11	(2.6%)	125	(29.0%)	295	(68.4%)
<b>TOTAL</b>	17	(1.1%)	318	(21.2%)	1163	(77.6%)
<b>Psychological &amp; Emotional Well-being</b>						
Cypress Hills	3	(1.0%)	21	(7.3%)	263	(91.6%)
Kananaskis Country	0	(0.0%)	17	(5.1%)	318	(94.9%)
Churchill	2	(0.4%)	33	(7.4%)	410	(92.1%)
Miquelon	5	(1.2%)	61	(14.2%)	363	(84.6%)
<b>TOTAL</b>	10	(0.7%)	132	(8.8%)	1354	(90.5%)
<b>Social Well-being</b>						
Cypress Hills	5	(1.7%)	45	(15.7%)	236	(82.5%)
Kananaskis Country	3	(0.9%)	35	(10.4%)	299	(88.7%)
Churchill	3	(0.7%)	55	(12.4%)	387	(87.0%)
Miquelon	3	(0.7%)	75	(17.5%)	350	(81.8%)
<b>TOTAL</b>	14	(0.9%)	210	(14.0%)	1272	(85.0%)
<b>Intellectual Well-being</b>						
Cypress Hills	5	(1.8%)	88	(31.0%)	191	(67.3%)
Kananaskis Country	8	(2.4%)	104	(31.0%)	223	(66.6%)
Churchill	14	(3.1%)	159	(35.7%)	273	(61.2%)
Miquelon	13	(3.0%)	176	(40.9%)	241	(56.0%)
<b>TOTAL</b>	40	(2.7%)	527	(35.3%)	928	(62.1%)
<b>Spiritual Well-being</b>						
Cypress Hills	5	(1.8%)	63	(22.3%)	215	(76.0%)
Kananaskis Country	5	(1.5%)	88	(26.3%)	241	(72.2%)
Churchill	7	(1.6%)	158	(35.7%)	278	(62.8%)
Miquelon	20	(5.1%)	151	(38.1%)	225	(56.8%)
<b>TOTAL</b>	37	(2.5%)	460	(31.6%)	959	(65.9%)
<b>Ecological Well-being</b>						
Cypress Hills	4	(1.4%)	98	(34.8%)	180	(63.8%)
Kananaskis Country	4	(1.2%)	75	(22.6%)	253	(76.2%)
Churchill	5	(1.1%)	175	(39.3%)	265	(59.6%)
Miquelon	15	(3.5%)	198	(46.4%)	214	(50.1%)
<b>TOTAL</b>	28	(1.9%)	546	(36.7%)	912	(61.4%)
<b>Environmental Well-being</b>						
Cypress Hills	3	(1.1%)	48	(16.9%)	233	(82.0%)
Kananaskis Country	3	(0.9%)	41	(12.2%)	292	(86.9%)
Churchill	5	(1.1%)	123	(27.6%)	317	(71.2%)
Miquelon	11	(2.6%)	129	(30.1%)	289	(67.4%)
<b>TOTAL</b>	22	(1.5%)	341	(22.8%)	1131	(75.7%)
<b>Cultural Well-being</b>						
Cypress Hills	8	(2.8%)	116	(41.0%)	159	(56.2%)
Kananaskis Country	11	(3.3%)	169	(50.4%)	155	(46.3%)
Churchill	7	(1.6%)	243	(55.1%)	191	(43.3%)
Miquelon	21	(4.9%)	257	(60.2%)	149	(34.9%)
<b>TOTAL</b>	47	(3.2%)	785	(52.8%)	654	(44.0%)
<b>Occupational Well-being</b>						
Cypress Hills	13	(4.6%)	101	(36.1%)	166	(59.3%)
Kananaskis Country	23	(6.9%)	144	(43.1%)	167	(50.0%)
Churchill	11	(2.5%)	151	(34.1%)	281	(63.4%)
Miquelon	21	(4.9%)	142	(33.2%)	265	(61.9%)
<b>TOTAL</b>	68	(4.6%)	538	(36.2%)	879	(59.2%)
<b>Economic Well-being</b>						
Cypress Hills	9	(3.2%)	146	(51.8%)	127	(45.0%)
Kananaskis Country	18	(5.4%)	180	(54.1%)	135	(40.5%)
Churchill						
Miquelon		Not asked		Not asked		Not asked
<b>TOTAL</b>	27	(4.4%)	326	(53.0%)	262	(42.6%)
<b>Financial Well-being</b>						
Cypress Hills	9	(3.2%)	104	(36.7%)	170	(60.1%)
Kananaskis Country	17	(5.1%)	130	(39.0%)	186	(55.9%)
Churchill	12	(2.7%)	150	(34.1%)	278	(63.2%)
Miquelon	15	(3.5%)	167	(39.2%)	244	(57.3%)
<b>TOTAL</b>	53	(3.6%)	551	(37.2%)	878	(59.2%)

All but last two Chi-Square test statistically significant (p<0.05)



# Cypress Hills Provincial Park





Table 10: Benefits of protected areas experiences to development of children.

Child Benefit	Disagree (Not important)		Neutral		Agree (Important)	
	Count	(%)	Count	(%)	Count	(%)
Physical development	20	(1.4%)	74	(5.1%)	1367	(93.6%)
Social competence and knowledge	20	(1.4%)	87	(6.0%)	1344	(92.6%)
Personal-social behaviour	30	(2.1%)	149	(10.3%)	1262	(87.6%)
Cognitive learning and language	31	(2.2%)	151	(10.5%)	1257	(87.4%)
Anxiety issues	44	(3.1%)	222	(15.6%)	1157	(81.3%)
Hyperactivity-inattention issues	47	(3.3%)	261	(18.4%)	1107	(78.2%)
Respiratory issues	65	(4.6%)	364	(26.0%)	972	(69.4%)

## SEASON I: COMMITMENT TO PARKS AND HEALTH AND WELL-BEING PERCEPTION

In the 2012 surveying season, a set of questions on commitment to parks were asked. They were not included in the 2013 survey. The sample size for 2012 is 620 and the surveys took place at two protected areas: Cypress Hills Provincial Park and Kananaskis Country PRAs.

The analysis of the Psychological Commitment Instrument (PCI) (Pritchard et al. 1999) revealed a number of insights pertaining to perceived health and well-being motivations and benefits associated with park experiences at Cypress Hills Provincial Park and Kananaskis Country PRAs. Overall, the PCI showed a relatively high level of visitor commitment to parks. Using a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), volitional choice had the highest valuation (a mean of 4.05), followed by informational complexity (3.60) and resistance to change (3.58). Position involvement was the least valued of the four antecedent processes (3.26) (see Table 11).

With one exception (i.e. the social well-being motivation) the correlational analyses revealed positive correlations between all health and well-being motivations and benefits and at least one of the four commitment antecedent processes (see Tables 12 and 13). Overall, this suggests that higher levels of commitment to parks were related to a greater motivation to visit parks for health and well-being-related reasons. That said the

resistance to change antecedent process had notably fewer positive correlations with the health and well-being attributes (in the case of motivations, physical, psychological, environmental and ecological well-being were correlated, while in the case of benefits, the same attributes with the exception of environmental well-being were correlated). Position involvement had the highest correlation levels for both motivations and benefits, meaning that the more involved individuals are in parks, the more motivated they are to visit parks for health and well-being related reasons, and the greater health and well-being benefits they receive from park experiences. Informational complexity and volitional choice also revealed high levels of correlation for most of the health and well-being motivations and benefits attributes, except with respect to the cultural, occupational and economic health and well-being attributes.

These results may be particularly useful for park agencies, and in particular for Alberta Parks. They illustrate determining factors, including demographic and motivational attributes, that can lead to higher psychological commitment and increased behavioural loyalty with regards to park visitation. Those with higher psychological commitment and behavioural loyalty to parks and protected areas may demand different marketing strategies than those who display lower levels. In addition, by examining individuals who display lower levels of commitment and loyalty, it may be possible to gain a better understanding of key motivational barriers that can constrain park participation and visitation.



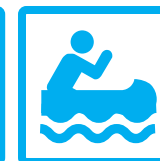


Table 11: Descriptive statistics for the Psychological Commitment Instrument (PCI).

Commitment items	Mean	SD
<b>Resistance to change</b>	<b>3.58</b>	
My preference to visit parks for leisure and recreation would not willingly change to an alternative leisure or recreation setting	3.97	.79
It would be difficult to change my beliefs about parks	3.16	1.15
To change my preference from visiting parks to other recreational and leisure settings would require major rethinking	3.61	1.01
<b>Position involvement</b>	<b>3.26</b>	
I prefer to visit parks because it makes me feel important	2.67	1.06
I visit parks because its image comes closest to reflecting my lifestyle	3.57	.99
When I visit my preferred park it reflects the kind of person I am	3.54	.97
<b>Informational complexity</b>	<b>3.60</b>	
I really know much about parks	3.69	.94
I am knowledgeable about parks	3.58	.83
I consider myself to be educated on parks	3.51	.86
<b>Volitional choice</b>	<b>4.05</b>	
My decision to visit this park is my own decision, freely chosen from several alternatives	4.19	.83
I controlled the decision on whether to visit this park	3.93	1.13
I am fully responsible for the decision to visit this park	4.03	1.01

Table 12: Correlation of commitment to parks with motivations.

Benefits (outcomes)	Resistance to change		Position involvement		Informational complexity		Volitional choice	
	r	p	r	p	r	p	r	p
Physical Well-being	.21	***	.16	***	.17	***	.21	***
Psychological Well-being	.18	***	.10	*	.10	**	.15	***
Social Well-being	-.04		.07		.03		.05	
Intellectual Well-being	.02		.07		.07		.08	*
Spiritual Well-being	.06		.13	**	.15	***	.09	*
Ecological Well-being	.13	**	.19	***	.18	***	.10	*
Environmental Well-being	.14	***	.18	***	.18	***	.21	***
Cultural Well-being	-.03		.12	**	.02		.00	
Occupational Well-being	.02		.16	***	.02		.00	
Economic Well-being	-.05		.17	***	.02		.02	
Financial Well-being	.02		.16	***	.10	**	.14	***

Note. \* p < .05, \*\* p < .01, \*\*\* p < .001



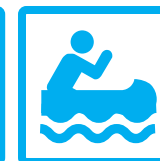


Table 13: Correlation of commitment to parks with benefits (outcomes).

Benefits (outcomes)	Resistance to change		Position involvement		Informational complexity		Volitional choice	
	r	p	r	p	r	p	r	p
Physical Well-being	.16	***	.18	***	.24	***	.24	***
Psychological Well-being	.20	***	.17	***	.19	***	.27	***
Social Well-being	-.01		.11	**	.10	*	.12	**
Intellectual Well-being	-.02		.19	***	.16	***	.10	*
Spiritual Well-being	.08		.18	***	.16	***	.14	***
Ecological Well-being	.09	*	.23	***	.19	***	.16	***
Environmental Well-being	.05		.16	***	.12	**	.14	***
Cultural Well-being	-.03		.18	***	.09	*	-.01	
Occupational Well-being	.01		.17	***	.08		.06	
Economic Well-being	-.03		.17	***	.07		.04	
Financial Well-being	.02		.14	***	.08		.08	*

Note. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

## SEASON 2: NATURE CONNECTEDNESS AND HEALTH AND WELL-BEING MOTIVATIONS/BENEFITS

In 2013 the commitment questions were replaced with a suite of questions relating to nature connectedness. This 2013 sample included 875 visitors to Sir Winston Churchill and Miquelon Lake provincial parks.

As noted above, nature relatedness measures an individual's general connection to nature. Responses from Sir Winston Churchill and Miquelon Lake visitors to the nature relatedness items are shown in Table 14.. Perhaps not surprisingly, park visitors had a very strong connection to nature, with means of 4.15 (on a 1-5 scale) at Sir Winston Churchill Provincial Park ( $SD = .74$ ) and 3.98 at Miquelon Lake Provincial Park ( $SD = .74$ ). The vast majority agreed most strongly with the statements "I take notice of wildlife wherever I am" (95.7%) and "I always think about how my actions affect the environment" (91.5%), but also with statements about the impacts of environment, spirituality, self-identity, and connectivity to living things. Churchill visitors appeared somewhat more connected to nature, having consistently agreed more strongly with all the statements. That said, while Churchill visitors rated all but one statement significantly

higher than Miquelon Lake visitors, the magnitude of the differences was modest. Similarly, while the combined mean of all six nature relatedness values for Sir Winston Churchill visitors (4.15) was significantly higher than for Miquelon visitors (3.98) ( $t=3.36$ ,  $p=0.001$ ), the magnitude of the difference was again only modest.

## BIVARIATE ANALYSIS

A bivariate analysis of the relationship between all the above variables was conducted, and is presented in Table 15 and Table 16. Data for all parks for both years were combined and utilized. Table 15 presents Spearman's Rank Correlations for all continuous and ordinal level variables, whereas Table 16 presents a means analysis of all variables by the remaining strictly categorical variables (i.e., gender, employment status, first visit to park, and park location). Note that to simplify the number of correlations and interpretation, a single overall mean of certain related ratings was calculated in many cases. For instance, the 11 Motivation Importance Ratings were combined to produce a single "Well-being Motivation Rating (Overall)" variable (i.e., using the mean across all responses), which was then correlated with other variables. Note also that the original ordinal categories were used. Please refer to table footnotes and the

# HEALTHY OUTSIDE/HEALTHY INSIDE



methods section for further details.

Given that Tables 15 and 16 contain a high number of significant correlation values and differences of means, and that different readers will have varying interests, there are ample findings to interpret in these two tables. Parks Division managers may be more interested in positive correlates of visit frequency, duration or activity engagement, whereas public health officials may be take notice of correlates of well-being and physical activities. Only a selection of highlights are discussed here, although research plans moving forward will involve a more thorough treatment of particular topics, including more multivariate analyses. Readers should also be cautioned that significant correlations or differences of means don't imply causation, only that a relationship likely exists, with an indication of general direction (i.e., positive or negative).

From a management perspective, it is noteworthy that visit frequency (to current park) correlated negatively with age, number of accompanying children, visit duration, perceived state of mental health, and number different sedate activities engaged in, and positively with perceived state of physical health, and well-being motivations and outcomes. Interestingly, variables such as education, income, employment status, and BMI correlated positively with frequency of visits to all protected areas, but not to the particular protected area the respondent was visiting at the time of the survey. Likewise, gender did not have a significant impact on frequency of visit. Although correlation does not imply causation, these results suggest that less frequent visitors

tend to be older, with more children, tend to stay longer, and have poor mental health. By contrast, more frequent visitors tend to be of better physical health, and perceive greater well-being benefits and outcomes of park visits.

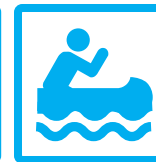
Other interesting variables to consider in this fashion are the well-being outcomes of park visits—the most highly correlated variable in the dataset (considering the absolute sum of all correlation values). Total benefits received from visits tend to be greater with age, years since first visit, frequency of visit, perceived state of physical health, life satisfaction, number of active and sedate activities, and especially nature relatedness (with a moderate positive correlation  $r=0.46$ ), and lower with perceived stress level. This is an exceptionally important

Table 14: Nature relatedness adapted item ratings, by park location (Sir Winston Churchill and Miquelon Lake provincial parks only).

	Disagree Count (%)	Neutral Count (%)	Agree Count (%)
<b>My ideal vacation spot would be a remote, wilderness area</b>			
Cypress Hills		Not asked	
Kananaskis Country			
Churchill	84 (20.6%)	21 (5.2%)	302 (74.2%)
Miquelon	125 (31.1%)	35 (8.7%)	242 (60.2%)
<b>TOTAL</b>	209 (25.8%)	56 (6.9%)	544 (67.2%)
<b>I always think about how my actions affect the environment</b>			
Cypress Hills		Not asked	
Kananaskis Country			
Churchill	19 (4.4%)	12 (2.8%)	397 (92.8%)
Miquelon	21 (5.1%)	19 (4.6%)	371 (90.3%)
<b>TOTAL</b>	40 (4.8%)	31 (3.7%)	768 (91.5%)
<b>My connection to nature and the environment is a part of my spirituality</b>			
Cypress Hills		Not asked	
Kananaskis Country			
Churchill	66 (17.9%)	30 (8.2%)	272 (73.9%)
Miquelon	78 (21.6%)	47 (13.0%)	236 (65.4%)
<b>TOTAL</b>	144 (19.8%)	77 (10.6%)	508 (69.7%)
<b>I take notice of wildlife wherever I am</b>			
Cypress Hills		Not asked	
Kananaskis Country			
Churchill	7 (1.6%)	7 (1.6%)	414 (96.7%)
Miquelon	8 (1.9%)	14 (3.4%)	395 (94.7%)
<b>TOTAL</b>	15 (1.8%)	21 (2.5%)	809 (95.7%)
<b>My relationship to nature is an important part of who I am</b>			
Cypress Hills		Not asked	
Kananaskis Country			
Churchill	38 (9.7%)	22 (5.6%)	331 (84.7%)
Miquelon	37 (9.8%)	42 (11.1%)	299 (79.1%)
<b>TOTAL</b>	75 (9.8%)	64 (8.3%)	630 (81.9%)
<b>I feel very connected to all living things and the earth</b>			
Cypress Hills		Not asked	
Kananaskis Country			
Churchill	32 (8.7%)	23 (6.3%)	311 (85.0%)
Miquelon	47 (12.6%)	47 (12.6%)	280 (74.9%)
<b>TOTAL</b>	79 (10.7%)	70 (9.5%)	591 (79.9%)

All but the 2nd statement were significantly different by park location ( $p<0.05$ )

# HEALTHY OUTSIDE/HEALTHY INSIDE



finding. It reveals that visitors' well-being outcomes from park visits tend to be higher when they visit more frequently and when they have a longer standing relationship with a particular area. This suggests that park visits are positively affecting visitors' physical and mental health, as reported by the visitors themselves.

Interestingly, well-being outcomes were not significantly related to gender, education, income, BMI, children, visit duration, or perceived mental health status. This suggests that those who get the most out of protected area visits with respect to health and well-being tend to be older, in good physical health, are happy with life and connected with nature, are involved in a lot of different activities, and have slightly higher stress levels prior to visiting. These visitors therefore exhibit greater room for improvement in terms of stress levels. Given the well-documented restorative benefits of nature, people with a strong sense of connection to the natural environment may purposely seek out parks for therapeutic reasons.

A third interesting variable to consider is the number of different physically active activities people engage in—the second most highly correlated variable in the dataset. The number of physically active activities tend to go up slightly with income, number of accompanying children, duration of visit, frequency of visit to all

parks, perceived state of mental health (but not physical health), and perceived well-being motivations/outcomes/child-benefits, but down with age. That said they are most highly correlated with the other two activity variables; number of educational/nature activities engaged in ( $r=0.49$ ) and number of sedate activities ( $r=0.56$ ). Overall, this suggests that those who do a lot of different physical activities tend to also engage in a wide diversity of activities as a whole. Interestingly, the number of different physically active activities was not significantly related to BMI, gender, or perceived state of physical health. Taken together, it appears that if a person perceives health and well-being benefits/outcomes, regardless of their perceived physical health or BMI, they will tend to engage in a wide range of different physical activities. All that said, the number of different physical activities does not consider their duration or frequency of the activities that visitor's engaged in, which would require further measurement.

Other very highly correlated factors include (in order, by the absolute sum of all correlation values): perceived well-being motivations, number of sedate activities engaged in, perceived state of physical health, nature relatedness, duration of park visits, life satisfaction, and perceived child benefits. These are left open to interpretation, and will be the focus of future multivariate analysis.

Table 15: Spearman's Rank correlation coefficients (continuous and ordinal-level variables).

	Highest level of education	Total household income	Age	Body Mass Index	# accompanying children	Duration of park visit (days)	Years since first visit	Frequency of visit to park in past 12 months	Frequency of visit to all parks in last year	Perceived state of physical health
Highest level of education <sup>1</sup>		.224**	-.077**	-.146**	-0.026	-.183**	-0.01	0.047	.263**	.150**
Total household income <sup>1</sup>	.224**		.128**	.060*	.106**	0.053	0.05	0.027	.092**	.074**
Age	-.077**	.128**		.221**	-.094**	.096**	.293**	-.099**	-0.048	0.039
Body Mass Index	-.146**	.060*	.221**		.100**	.151**	.060*	-0.06	-.061*	-.281**
# accompanying children	-0.026	.106**	-.094**	.100**		.143**	-.081**	-.096**	0.027	-0.046
Duration of park visit (days)	-.183**	0.053	.096**	.151**	.143**		-0.05	-.153**	-.082**	-.173**
Years since first visit	-0.01	0.05	.293**	.060*	-.081**	-0.05		0.025	.094**	0.042
Frequency of visit to park in past 12 months	0.047	0.027	-.099**	-0.06	-.096**	-.153**	0.025		.134**	.097**
Frequency of visit to all parks in last year	.263**	.092**	-0.048	-.061*	0.027	-.082**	.094**	.134**		.098**
Perceived state of physical health <sup>1</sup>	.150**	.074**	0.039	-.281**	-0.046	-.173**	0.042	.097**	.098**	
Perceived state of mental health <sup>1</sup>	-.103**	0.05	-0.025	.079**	.182**	.239**	-.215**	-.139**	-.094**	0.028
Perceived stress level prior to visit <sup>1</sup>	-0.042	-.055*	.109**	-.061*	-0.032	-.080**	0.055	0.037	0.017	.147**
Life satisfaction score (Overall) <sup>2</sup>	.121**	.207**	0.001	-.079**	.068**	0.009	0.048	0.008	.080**	.257**
Well-being Motivation Rating (Overall) <sup>3</sup>	0.000	-0.028	.092**	0.031	-0.031	-.060*	.062*	.101**	0.019	.170**
Well-being Outcome Rating (Overall) <sup>3</sup>	0.028	-0.032	.059*	0.014	-0.032	-0.044	.060*	.118**	0.033	.174**
Child Benefit Outcome Rating (Overall) <sup>3</sup>	.071**	0.017	-0.016	0.022	0.022	0.036	0.04	0.000	.090**	.108**
Nature Relatedness (Overall) <sup>3</sup>	0.005	-0.047	.102**	0.026	-0.046	-0.014	0.036	0.02	.081*	.151**
# Active Activities Engaged in	0.01	.102**	-.112**	0.016	.213**	.266**	-0.04	0.062	.118**	-0.042
# Educational/Nature Activities Engaged in	.057*	-0.017	0.01	0.013	-0.015	0.02	0.016	0.000	.100**	-.056*
# of Sedate Activities Engaged in	-.063*	0.018	-0.05	0.051	0.036	.267**	-.091**	-.094**	-0.039	-.146**



# HEALTHY OUTSIDE/HEALTHY INSIDE



Table 15: Continued

	Perceived state of mental health	Perceived stress level prior to visit	Life satisfaction score (Overall)	Well-being Motivation Rating (Overall)	Well-being Outcome Rating (Overall)	Child Benefit Outcome Rating (Overall)	Nature Relatedness (Overall)	# Active Activities Engaged in	# Educational/Nature Activities Engaged in	# of Sedate Activities Engaged in
Highest level of education <sup>1</sup>	-.103**	-0.042	.121**	0.000	0.028	.071**	0.005	0.01	.057*	-.063*
Total household income <sup>1</sup>	0.05	-.055*	.207**	-0.028	-0.032	0.017	-0.047	.102**	-0.017	0.018
Age	-0.025	.109**	0.001	.092**	.059*	-0.016	.102**	-.112**	0.01	-0.05
Body Mass Index	.079**	-.061*	-.079**	0.031	0.014	0.022	0.026	0.016	0.013	0.051
# accompanying children	.182**	-0.032	.068**	-0.031	-0.032	0.022	-0.046	.213**	-0.015	0.036
Duration of park visit (days)	.239**	-.080**	0.009	-.060*	-0.044	0.036	-0.014	.266**	0.02	.267**
Years since first visit	-.215**	0.055	0.048	.062*	.060*	0.04	0.036	-0.04	0.016	-.091**
Frequency of visit to park in past 12 months	-.139**	0.037	0.008	.101**	.118**	0	0.02	0.062	0	-.094**
Frequency of visit to all parks in last year	-.094**	0.017	.080**	0.019	0.033	.090**	.081*	.118**	.100**	-0.039
Perceived state of physical health <sup>1</sup>	0.028	.147**	.257**	.170**	.174**	.108**	.151**	-0.042	-.056*	-.146**
Perceived state of mental health <sup>1</sup>	0.009	0.009	.109**	-0.016	-0.041	.133**	.101**	.108**	-.081**	.089**
Perceived stress level prior to visit <sup>1</sup>	0.009	0.009	.206**	-0.047	-.085**	-0.014	-0.01	-0.05	-0.031	-0.033
Life satisfaction score (Overall) <sup>2</sup>	.109**	.206**		.176**	.182**	.225**	.158**	0.036	-0.025	-0.017
Well-being Motivation Rating (Overall) <sup>3</sup>	-0.016	-0.047	.176**		.723**	.374**	.513**	.064**	.096**	-0.042
Well-being Outcome Rating (Overall) <sup>3</sup>	-0.041	-.085**	.182**	.723**		.393**	.459**	.078**	.098**	-0.039
Child Benefit Outcome Rating (Overall) <sup>3</sup>	.133**	-0.014	.225**	.374**	.393**		.264**	.083**	.060*	0.043
Nature Relatedness (Overall) <sup>3</sup>	.101**	-0.01	.158**	.513**	.459**	.264**		0.059	.109**	-0.034
# Active Activities Engaged in	.108**	-0.05	0.036	.064*	.078**	.083**	0.059		.497**	.595**
# Educational/Nature Activities Engaged in	-.081**	-0.031	-0.025	.096**	.098**	.060*	.109**	.497**		.599**
# of Sedate Activities Engaged in	.089**	-0.033	-0.017	-0.042	-0.039	0.043	-0.034	.595**	.599**	

\* Correlation is significant at the 0.05 level (2-tailed).

\*\* Correlation is significant at the 0.01 level (2-tailed).

<sup>2</sup>Calculated as a sum of the original series of 5 ratings, measured in their original ordinal categories (see methods for more details)

<sup>3</sup>Calculated as a mean of the original series of 6-11 ratings, measured in their original ordinal categories (see methods for more details)

## MULTIVARIATE ANALYSIS: PRINCIPAL COMPONENTS OF PARK VISITORS

Whereas the previous sections focus on univariate and bivariate relationships among the variables, a Principal Components Analysis (PCA) was used to explore the interrelationships among all variables, and to potentially define new dimensions (i.e., “Components”) related to park visitors. In practice, each component can be interpreted as a unique group/segment of protected area visitors that share like attributes (i.e., variables that “load” most significantly onto the component), and may be of particular interest for park management and marketing purposes. The first component explains the maximum variance or the strongest gradient in the data (as expressed by an eigenvalue). Successive components explain decreasing amounts of variance. Components with eigenvalues less than 1.0 are not shown as they explain less variance than a single variable.

To account for missing data, variables were excluded on a pairwise basis. Pairwise exclusion means that rather than dropping a respondent from the entire analysis

due to perhaps only one missing value, a respondent is excluded only from analyses that include variables they have missing data for. For large sample sizes it is common practice to accept lower factor loadings as evidence that a variable loaded meaningfully onto a factor. Here, only variables with factor loadings greater than +/- 0.30 are shown (they are considered most dominant in the given component), and the matrix was left un-rotated (rotation can be used to distribute the variance explained more evenly among components, if desired). Although PCA technically requires continuous-level data due to its reliance on correlation matrices, ordinal and binary-level variables are generally accepted when the analysis is of an exploratory nature, as in this report. Data was analyzed using SPSS version 21.

The output of the PCA for all parks in Table 17 shows the number of components, the percent variance explained, and the factor loadings for each variable on its particular component. Overall the PCA identified eight distinct visitor groups, of which the first five will be discussed. The first group/segment (i.e. component) include visitors who perceive many well-being motivations and outcomes of park visitation and tend to participate in a

# HEALTHY OUTSIDE/HEALTHY INSIDE

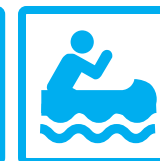


Table 16: Means analysis by categorical variables.

	Location				Gender		Employment status			First visit to park?		TOTAL
	Cypress	Kananaskis Country	Churchill	Miquelon	Male	Female	Employed <sup>4</sup>	Un-employed <sup>5</sup>	Not in labour force	No	Yes	
Body Mass Index	26.3 <sub>ab</sub>	25.1 <sub>a</sub>	26.8 <sub>b</sub>	26.6 <sub>bc</sub>	27.2 <sub>a</sub>	25.4 <sub>b</sub>	26.3 <sub>a</sub>	26.1 <sub>a</sub>	25.8 <sub>a</sub>	26.4 <sub>a</sub>	25.9 <sub>a</sub>	26.3
# of accompanying children	.9 <sub>a</sub>	1.0 <sub>a</sub>	1.8 <sub>ab</sub>	2.0 <sub>b</sub>	1.5 <sub>a</sub>	1.6 <sub>a</sub>	1.6 <sub>a</sub>	1.4 <sub>a</sub>	1.4 <sub>a</sub>	1.5 <sub>a</sub>	1.6 <sub>a</sub>	1.5
Duration of park visit (days)	3.6 <sub>a</sub>	1.8 <sub>b</sub>	4.2 <sub>a</sub>	4.3 <sub>a</sub>	3.6 <sub>a</sub>	3.6 <sub>a</sub>	3.5 <sub>a</sub>	3.3 <sub>a</sub>	4.1 <sub>a</sub>	3.8 <sub>a</sub>	3.1 <sub>b</sub>	3.6
Years since first visit	20 <sub>a</sub>	16 <sub>b</sub>	7 <sub>c</sub>	12 <sub>d</sub>	12 <sub>a</sub>	12 <sub>a</sub>	11 <sub>a</sub>	13 <sub>ab</sub>	15 <sub>b</sub>	16 <sub>a</sub>	n/a	12
Frequency of visit to park in past 12 months	5.3 <sub>ab</sub>	7.8 <sub>a</sub>	6.2 <sub>a</sub>	2.3 <sub>b</sub>	5.6 <sub>a</sub>	4.9 <sub>a</sub>	5.6 <sub>a</sub>	5.8 <sub>a</sub>	3.1 <sub>a</sub>	5.2 <sub>a</sub>	n/a	5.2
Frequency of visit to all parks in last year	12.4 <sub>a</sub>	12.7 <sub>a</sub>	8.2 <sub>b</sub>	9.0 <sub>ab</sub>	10.2 <sub>a</sub>	10.3 <sub>a</sub>	9.7 <sub>a</sub>	8.9 <sub>ab</sub>	13.8 <sub>b</sub>	10.8 <sub>a</sub>	9.2 <sub>a</sub>	10.2
Perceived state of physical health <sup>1</sup>	3.5 <sub>ab</sub>	3.7 <sub>a</sub>	3.5 <sub>ab</sub>	3.4 <sub>b</sub>	3.6 <sub>a</sub>	3.5 <sub>a</sub>	3.6 <sub>a</sub>	3.2 <sub>b</sub>	3.5 <sub>ab</sub>	3.6 <sub>a</sub>	3.5 <sub>b</sub>	3.5
Perceived state of mental health <sup>1</sup>	2.2 <sub>a</sub>	2.1 <sub>a</sub>	3.9 <sub>b</sub>	3.8 <sub>b</sub>	3.1 <sub>a</sub>	3.2 <sub>a</sub>	3.2 <sub>a</sub>	3.0 <sub>a</sub>	3.1 <sub>a</sub>	3.1 <sub>a</sub>	3.2 <sub>a</sub>	3.1
Perceived stress level prior to visit <sup>1</sup>	2.9 <sub>a</sub>	3.0 <sub>a</sub>	2.8 <sub>a</sub>	2.9 <sub>a</sub>	2.9 <sub>a</sub>	2.9 <sub>a</sub>	2.8 <sub>a</sub>	2.8 <sub>a</sub>	3.3 <sub>b</sub>	2.9 <sub>a</sub>	2.8 <sub>a</sub>	2.9
Life satisfaction score (Overall) <sup>2</sup>	26.8 <sub>a</sub>	27.0 <sub>a</sub>	27.4 <sub>a</sub>	26.9 <sub>a</sub>	26.7 <sub>a</sub>	27.4 <sub>b</sub>	27.0 <sub>a</sub>	26.1 <sub>a</sub>	27.8 <sub>a</sub>	27.2 <sub>a</sub>	26.9 <sub>a</sub>	27.1
Well-being Motivation Rating (Overall) <sup>3</sup>	5.1 <sub>ab</sub>	5.3 <sub>a</sub>	5.2 <sub>ab</sub>	5.0 <sub>b</sub>	5.1 <sub>a</sub>	5.2 <sub>a</sub>	5.1 <sub>a</sub>	5.0 <sub>a</sub>	5.2 <sub>a</sub>	5.2 <sub>a</sub>	5.1 <sub>a</sub>	5.1
Well-being Outcome Rating (Overall) <sup>3</sup>	5.2 <sub>a</sub>	5.3 <sub>a</sub>	5.2 <sub>a</sub>	5.0 <sub>b</sub>	5.2 <sub>a</sub>	5.2 <sub>a</sub>	5.2 <sub>a</sub>	5.0 <sub>a</sub>	5.2 <sub>a</sub>	5.2 <sub>a</sub>	5.2 <sub>a</sub>	5.2
Child Benefit Outcome Rating (Overall) <sup>3</sup>	5.9 <sub>ac</sub>	5.8 <sub>a</sub>	6.1 <sub>b</sub>	6.0 <sub>bc</sub>	5.9 <sub>a</sub>	6.0 <sub>b</sub>	6.0 <sub>a</sub>	5.8 <sub>a</sub>	6.0 <sub>a</sub>	6.0 <sub>a</sub>	5.9 <sub>a</sub>	5.9
Nature Relatedness (Overall) <sup>3</sup>		Not asked	4.1 <sub>a</sub>	4.0 <sub>b</sub>	4.1 <sub>a</sub>	4.0 <sub>b</sub>	4.1 <sub>a</sub>	3.9 <sub>a</sub>	4.1 <sub>a</sub>	4.1 <sub>a</sub>	4.0 <sub>a</sub>	4.1
# of Active Activities Engaged in	2.7 <sub>a</sub>	1.9 <sub>b</sub>	3.1 <sub>c</sub>	2.4 <sub>a</sub>	2.6 <sub>a</sub>	2.6 <sub>a</sub>	2.6 <sub>a</sub>	2.1 <sub>a</sub>	2.5 <sub>a</sub>	2.6 <sub>a</sub>	2.5 <sub>a</sub>	2.5
# of Education/Nature Activities Engaged in	1.2 <sub>a</sub>	1.0 <sub>ab</sub>	1.0 <sub>ab</sub>	.8 <sub>b</sub>	1.1 <sub>a</sub>	.9 <sub>a</sub>	1.0 <sub>a</sub>	.7 <sub>a</sub>	1.3 <sub>b</sub>	1.0 <sub>a</sub>	1.1 <sub>a</sub>	1
# of Sedate Activities Engaged in	3.9 <sub>a</sub>	2.6 <sub>b</sub>	4.1 <sub>a</sub>	4.0 <sub>a</sub>	3.7 <sub>a</sub>	3.7 <sub>a</sub>	3.6 <sub>a</sub>	3.4 <sub>a</sub>	3.9 <sub>a</sub>	3.6 <sub>a</sub>	3.9 <sub>b</sub>	3.7

Note: Values in the same row and sub-table not sharing the same subscript are significantly different at  $p < .05$  in the two-sided test of equality for column means. Cells with no subscript are not included in the test. Tests assume equal variances.<sup>2</sup>

<sup>1</sup> Measured in original categories: 7 categories for education, 10 for income, 5 for perceived health (see methods for more details)

<sup>2</sup> Calculated as a sum of the original series of 5 ratings, measured in their original ordinal categories (see methods for more details)

<sup>3</sup> Calculated as a mean of the original series of 6-11 ratings, measured in their original ordinal categories (see methods for more details)

<sup>4</sup> Work for pay or in self-employment

<sup>5</sup> Without paid work or without self-employment work, and available for work

Table 17: Principal components analysis results, all protected areas.

	Component							
	1	2	3	4	5	6	7	8
Eigenvalue	2.3	2.2	1.7	1.5	1.3	1.2	1.2	1.1
% of Variance	11.4	11.2	8.3	7.5	6.7	6.2	5.9	5.4
	Factor Loadings							
Age			-0.41	0.62				
Gender				-0.38		-0.31		0.53
Total household income				0.42		0.48	-0.34	
Highest level of education			0.47			0.31	-0.35	
Body Mass Index			-0.60					
# of accompanying children						0.40	0.67	
Duration of park visit (days)								
Years since first visit			-0.31	0.55				
Frequency of visit to park in past 12 months					-0.37		0.32	-0.41
Frequency of visit to all parks in last year							0.44	0.46
Perceived state of physical health <sup>1</sup>		0.53	0.39					-0.32
Perceived state of mental health <sup>1</sup>					0.67			
Perceived stress level prior to visit <sup>1</sup>					0.32	-0.54		
Life satisfaction score (Overall) <sup>2</sup>		0.51			0.49			
Well-being Motivation Rating (Overall) <sup>3</sup>	0.31	0.70	-0.35					
Well-being Outcome Rating (Overall) <sup>3</sup>	0.31	0.70	-0.33					
Child Benefit Outcome Rating (Overall) <sup>3</sup>	0.32	0.47						0.33
# of Active Activities Engaged in	0.80							
# of Education/Nature Activities Engaged in	0.74							
# of Sedate Activities Engaged in	0.79	-0.33						

Extraction Method: Principal Component Analysis.

a 18 components extracted.

<sup>1</sup> Measured in original categories: 7 categories for education, 10 for income, 5 for perceived health (see methods for more details)

<sup>2</sup> Calculated as a sum of the original series of 5 ratings, measured in their original ordinal categories (see methods for more details)

<sup>3</sup> Calculated as a mean of the original series of 6-11 ratings, measured in their original ordinal categories (see methods for more details)

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Table 18: Principal components analysis results, Cypress Hills Provincial Park and Kananaskis Country PRAs (season 1, 2012).

	Component							
	1	2	3	4	5	6	7	8
Eigenvalue	2.9	2.5	1.7	1.6	1.6	1.2	1.2	1.1
% of Variance	12.1	10.2	7.1	6.8	6.5	5.1	4.9	4.5

	Factor Loadings								n
	1	2	3	4	5	6	7	8	
Age			0.62						611
Gender			-0.48			0.36			620
Total household income			0.41			-0.31	-0.45		548
Highest level of education					0.49		-0.40		611
Body Mass Index		0.31	0.43	-0.38					524
# of accompanying children							0.35		611
Duration of park visit (days)		0.47						-0.42	623
Years since first visit			0.51			0.36			376
Frequency of visit to park in past 12 months					0.40		0.38		393
Frequency of visit to all parks in last year								0.64	594
Perceived state of physical health <sup>1</sup>	0.49	-0.40		0.33					631
Perceived state of mental health <sup>1</sup>	-0.51			-0.37	0.40				631
Perceived stress level prior to visit <sup>1</sup>				0.38	-0.47				631
Life satisfaction score (Overall) <sup>2</sup>	0.53			0.35					614
Well-being Motivation Rating (Overall) <sup>3</sup>	0.54			-0.38		-0.31			633
Well-being Outcome Rating (Overall) <sup>3</sup>	0.59			-0.43					628
Child Benefit Outcome Rating (Overall) <sup>3</sup>	0.46						-0.32		586
# of Active Activities Engaged in		0.74		0.36					634
# of Education/Nature Activities Engaged in		0.60							634
# of Sedate Activities Engaged in		0.72		0.40					634
<b>COMMITTED</b>									
<b>Resistance to Change<sup>3</sup></b>	0.358				0.402	0.388			598
<b>COMMITTED</b>									
<b>Position Involvement<sup>3</sup></b>	0.394						0.35		606
<b>COMMITTED</b>									
<b>Volitional Choice<sup>3</sup></b>	0.461				0.306				611
<b>COMMITTED</b>									
<b>Informational Complexity<sup>3</sup></b>	0.545						0.344		615

1. Measured in original categories: 7 categories for education, 10 for income, 5 for perceived health (see methods for more details)  
 2. Calculated as a sum of the original series of 5 ratings, measured in their original ordinal categories (see methods for more details)  
 3. Calculated as a mean of the original series of 6-11 ratings, measured in their original ordinal categories (see methods for more details)

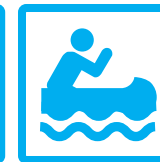
lot of different activities (physical, education/nature and sedate), regardless of any other factor (meaning they come from all socio-demographic, economic, perceived health and visitation backgrounds). The second group/segment (i.e. component) similarly perceive even more well-being motivations and outcomes of park visitation, but tend to be those in good physical health and who are particularly satisfied with life. The third group/segment (i.e. component) identified individuals who perceive fewer well-being motivations and outcomes, and tend to be younger, more educated, and in better

physical health (less obese, higher perceived physical health). It is interesting at this point to note that the first three components (which explain the most variance) are all distinguished by strong well-being motivations and outcomes. The remaining components represent a mixed bag of visitor groups.

Separate PCAs were also run for Cypress Hills Provincial Park and Kananaskis PRAs combined (season 1), and Sir Winston Churchill and Miquelon Lake provincial parks combined (season 2), as shown in Tables 18 and 19. This



# HEALTHY OUTSIDE/HEALTHY INSIDE



was done in part because each year had one series of new questions added to the survey, which are included in the new PCA results (in bold at bottom of each table). When examining data from these different survey years individually, results are strikingly different from those of the total sample, especially with respect to the strong role played by perceived states of physical and mental health in distinguishing the components. In particular, the first component in the analysis of each season is distinguished by higher well-being motivations and outcomes (as before), but now higher physical health and low mental health (season 1) and higher physical and mental health (season 2). These first components also include variables related to Visitor Commitment

and Nature Relatedness, attesting to their importance in further distinguishing visitors. The second components are equally unique, characterized in season 1 by representing visitors with higher BMIs, lower physical health, and more activities engaged in, and in season 2 by poorer physical and mental health and more activities engaged in. Subsequent components are also highly distinctive. These represent potentially distinct groups to cater to in each park with respect to health. Future PCA analysis using different combinations of variables and parks is expected moving forward, and is anticipated to culminate in a publication.

Table 19: Principal components analysis results, Miquelon Lake and Sir Winston Churchill provincial parks (season 2, 2013).

	Component							
	1	2	3	4	5	6	7	8
Eigenvalue	2.8	2.3	1.9	1.6	1.4	1.2	1.1	1.1
% of Variance	13.2	11.1	9.0	7.6	6.5	5.9	5.3	5.2

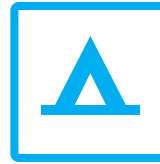
  

	Factor Loadings								n
	1	2	3	4	5	6	7	8	
Age				0.63					611
Gender				-0.38			0.69	0.35	620
Total household income			0.33			0.65			548
Highest level of education			0.35			0.53		0.31	611
Body Mass Index			-0.48	0.38					524
# of accompanying children					0.70			-0.31	611
Duration of park visit (days)					0.38				623
Years since first visit				0.42	0.33			0.58	376
Frequency of visit to park in past 12 months				-0.42			-0.40	0.36	393
Frequency of visit to all parks in last year					0.66				594
Perceived state of physical health <sup>1</sup>	0.49	-0.32	0.46						631
Perceived state of mental health <sup>1</sup>	0.43	-0.32	0.45						631
Perceived stress level prior to visit <sup>1</sup>			0.34	0.31		-0.39			631
Life satisfaction score (Overall) <sup>2</sup>	0.48		0.39						614
Well-being Motivation Rating (Overall) <sup>3</sup>	0.76		-0.42						633
Well-being Outcome Rating (Overall) <sup>3</sup>	0.74		-0.38						628
Child Benefit Outcome Rating (Overall) <sup>3</sup>	0.52						0.37		586
# of Active Activities Engaged in	0.33	0.76							634
# of Education/Nature Activities Engaged in	0.34	0.79							634
# of Sedate Activities Engaged in		0.82							634
<b>Nature Relatedness (Overall)<sup>3</sup></b>	0.6		-0.347						598

<sup>1</sup> Measured in original categories: 7 categories for education, 10 for income, 5 for perceived health (see methods for more details)

<sup>2</sup> Calculated as a sum of the original series of 5 ratings, measured in their original ordinal categories (see methods for more details)

<sup>3</sup> Calculated as a mean of the original series of 6-11 ratings, measured in their original ordinal categories (see methods for more details)



## SUMMARY OF RESULTS

The results of this study highlight the importance of Alberta's parks and protected areas as spaces where Albertans pursue a healthy and happy lifestyle. In addition to their important role in representing natural regions and conserving biodiversity, protected areas can enhance various aspects of human health and well-being. Indeed, nearly 70% of the surveyed visitors reported a perceived improvement of their health and well-being due to their park visit. This study reveals that Alberta parks and protected areas are very important providers of physical and mental health improvements for Alberta's citizens. Moreover, as findings suggest that these areas are relevant in a wider health context, these results should be brought to the attention of public health authorities, who might consider park visitation as part of the suite of public health initiatives funded by government.

Motivations for visiting parks and benefits (or outcomes) associated with park experiences were perceived similarly, although some minor statistical differences were identified. Overall, the psychological/emotional, social, and physical well-being benefits were the most highly ranked attributes, while the economic and cultural well-being attributes were less valued. The differences between the mean values of motivations and benefits received by visitors were, overall, very small. Therefore, the perceived benefits (or outcomes) associated with visitation appear to largely match what visitors expect from their park experience. Finally, visits to parks are perceived to play an important role in child development, especially by females and particularly with respect to the benefits that are associated with physical development, social knowledge and competence, and cognitive learning and language. This finding may not be surprising to the many parents in Alberta that take their children on vacations to parks, but it is important for public health authorities to note the perceived value of such visits on the part of parents.

These results are generally consistent with the research of Lemieux et al. (2012), and with other literature outside the parks and protected areas field that focuses on the connection between nature and human health and well-being (e.g. Godbey 2009; Kuo 2010; Lee and Maheswaran 2010; Health Council of the Netherlands and Dutch Council for Research on Spatial Planning Nature and the Environment, 2004; Nilsson et al. 2007; Townsend and Weerasuriya 2010). However, while the extant literature has focused on the physical and psychological/emotional benefits of contact with nature, our study has extended these results by revealing that other attributes of health and well-being are also very important, particularly social and spiritual well-being (see also Heintzman, 2013 and Manning et al., 1996).

The demographic analysis revealed a number of interesting perceptual differences among visitors in relation to health and well-being in terms of both motivations and outcomes. For instance, older individuals place much more importance on (or obtain much more benefit from) spiritual, cultural or economic aspects of well-being than younger people, who tend to value physical, psychological or social well-being more. With respect to gender, levels of household income, and education, a number of interesting differences emerged in the data. In particular, females perceived their visit to be of greater benefit than males, particularly with respect to spiritual, social, psychological/emotional and financial well-being. Females were also more highly motivated to visit protected areas to achieve these expected benefits. It may be that women, in particular, seek out parks for restoration and stress reduction. The role of park

*“Alberta Parks has a cadre of highly committed visitors, many of whom visit to improve their health and well-being”.*

# HEALTHY OUTSIDE/HEALTHY INSIDE



visits and gender-specific coping strategies, are worth further study, as is a more thorough assessment of the potential benefits of parks for family dynamics and child development.

This study also found that visitors with a higher commitment to parks were more motivated to visit the park for health and well-being related reasons, and also received greater health and well-being outcomes due to their visit. Ecological, environmental, physical and psychological well-being benefits were most valued by visitors who were highly committed to parks and conservation in general. Another interesting result is that the visitors that highly self-identify with protected areas are the ones that are the most highly motivated to visit parks for health and well-being related reasons. These individuals also receive greater health and well-being benefits compared to those that exhibit a lower position involvement. This finding shows that Alberta Provincial Parks has a cadre of highly committed visitors. This is a manager's dream, as the development of a commitment to a brand, idea, or activity is the purpose of virtually every corporation's marketing department.

Beyond their commitment to Alberta's parks and protected areas, there was a strong correlation between visitors' perceived connectedness to nature and motivations to visit protected areas for health and well-being related reasons. Individuals with a stronger connection also tended to report a higher magnitude of benefits as a result of their experience. Ostensibly, the more connected one is to nature, the greater the motivation to visit Alberta's protected areas and the

greater benefits received from the protected area experiences. This suggests that people with a strong connection to nature value their time in parks, and deliberately seek out such experiences to improve their health and happiness. Interestingly, nature connectedness was also positively correlated with higher age, higher frequency of visits, higher perceived state of physical and mental health, and higher life satisfaction. Therefore, visits to Alberta's parks and protected areas contribute positively to a person's perceived health and overall life satisfaction, and provide a much-needed respite from the stresses of daily life. While the cross-sectional data here limit our ability to make causal assumptions, a diverse body of literature suggests that park visits enhance and maintain visitors' sense of nature relatedness and well-being (Nisbet et al., 2011). Findings here, in combination with a growing literature, therefore suggest that fostering a sense of nature connectedness among visitors may be a key strategy to maintain and strengthen commitment to Alberta parks and protected areas.

Finally, it is worth noting the high response rate associated with the questionnaire that was administered at the different case study sites. Based on this success, Alberta Parks should consider adopting such innovative approaches to on-site survey administration. The adoption of tablet computers (such as iPad and Android-based devices) can be more cost efficient than paper surveys, especially for large survey samples (e.g., the Parks Division's 'Camper Satisfaction Survey'). They have also been shown to garner a higher than average response rate than online and mail surveys, and thus contribute to results that are more likely to be representative of the larger population. As there is no input cost, input delay, or input error when respondents provide data directly into the database, on-site digital surveys can also improve research reliability. Alberta Parks should encourage researchers, both internal and external to government, to adopt such technologies to reduce survey response fatigue and enhance the overall survey experience of visitors.

*“There was a very high response rate because the survey was conducted in-person, with the use of tablet computers”.*



Sir Winston Churchill Provincial Park







## KEY FINDING:

*“A strategic framework in support of a short-term (5 year) and medium-term (10 year) action plan to promote the health and well-being of Alberta’s ecosystems and residents should be developed.”*





# Kananaskis Country







# Recommendations and Conclusions

## RECOMMENDATIONS FOR STRATEGIC POLICY AND BENEFITS-BASED MANAGEMENT

Understanding and conveying the benefits that are provided by visitor experiences in parks and protected areas is critical for their survival, but to-date this topic has received relatively little attention in Alberta and Canada. Benefits-based management (BBM) suggests that if visitors participate in certain activities in appropriate settings they will not only achieve their desired recreation experience, but also accrue a series of benefits, both inside and outside of protected areas, as well as over the short-term and long-term (Weber and Anderson, 2010). As Moyle et al. (2014) explain, BBM involves identifying and defining explicit target benefits (outcomes) that can lead to potential beneficial consequences for the individual or society. BBM also enables managers to capture the benefits (or outcomes) that parks and protected areas agencies need to convey to their constituent publics in order to sustain visitor experiences (Moyle et al., 2014). Specifically, using the BBM approach, managers can specify the benefits they wish to provide, can design facilities and visitor experiences around these benefits, can select appropriate settings, and can measure the extent to which benefits have been realized (Allen and McGovern, 1997).

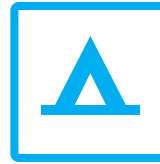
The findings in this report reveal a potential connection between parks and protected areas, BBM, and the health and well-being needs of visitors (including potential visitors). Overall, the research provides strong evidence of the important role that parks and protected areas play as health and well-being providers. However, as Maller

et al. (2008, p. 21) state, parks still “need recognition for the essential role they play in preserving, maintaining, and promoting the health of the humans, as well as that of their environment”.

Overall, benefits focused policies and communications within the Parks Division are relatively weak in regards to health, and focus primarily on benefits associated with ecosystem services. The results of this study therefore have important implications for the different conservation and recreation policies and programs developed by the Parks Division, for leisure stakeholders operating in parks and protected areas, and for health and well-being policy officials. In particular, they highlight the need for agencies to better understand the health and well-being benefits received by social and population subgroups (e.g., youth, elderly, couples, etc.) so that informed policies and programs in support of health and well-being related pursuits can be developed.

In an effort to advance this discussion, we provide a number of recommendations for the Parks Division's knowledge/user groups, including policy makers, parks and protected areas managers, social and health professionals, and other researchers. For strategic policy makers, it is crucial for provincial health and conservation policies to adopt a more integrated perspective and approach to policy formulation by better recognizing the role that nature, parks and other forms of protected areas play in maintaining and enhancing human health and well-being. While the department of Environment and Sustainable Resource Development has the lead responsibility for protected areas, many other ministries throughout the Government of Alberta support the

# HEALTHY OUTSIDE/HEALTHY INSIDE



sector through programs, service delivery, and funding. These include the new department of Culture and Tourism (through tourism promotion), Alberta Health (through promotion of healthy lifestyles, including physical activity, through its many programs and services), Education (plays a key role in encouraging Albertans to adopt healthy lifestyles), and the ministries of Transportation, Infrastructure, and Municipal Affairs, whose policies influence the development of communities in ways that encourage active living. Furthermore, potential collaborations with the Alberta Recreation Trails Partnership pilot project could be pursued.

In particular, it is important that Alberta's protected areas be recognized for the role that they can play in delivering health services and in reducing costs to the health care system. In other words, Alberta's parks and protected areas should be viewed as a positive health resource that is better incorporated into strategic policy within the Department, including *Alberta's Land-Use Framework*<sup>2</sup> (Government of Alberta, 2008) and *Plan for Parks* (Government of Alberta, 2009). While the Parks Division's *Plan for Parks* recognizes that "parks provide diverse, enjoyable outdoor recreation opportunities that contribute to healthy lifestyles", a more comprehensive strategic BBM policy or action plan is required to support health promotion within the context of Alberta's protected areas network. Specifically, a strategic action plan inclusive of a vision, guiding principles, and a strategic framework in support of a short-term (5 year) and medium-term (10 year) action plan to promote the health and well-being of Alberta's ecosystems and residents should be developed.

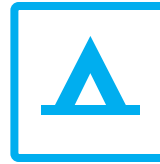
The Government of Alberta's social, education and health professionals (e.g., Alberta Health), on the other hand, could work towards building awareness of the various roles that parks and other forms of protected areas can play in health policy and health promotion. Clearly, developing innovative partnerships with parks and

protected area managers to implement both preventative and treatment-related activities would greatly support this goal. It may be beneficial to initiate this process by examining how contact with nature via parks could be used as a preventive measure, potentially contributing to health-oriented initiatives like "Active Alberta 2011-2021" (Government of Alberta, 2011), or to programs that inform the public and other stakeholders about how Alberta's protected areas enhance quality of life, protect key ecosystems, and contribute to healthy communities.

Given that this research strongly suggests that health and well-being benefits received by visitors differ based on experiences provided within different landscape and biodiversity contexts, it will be important to partner with local Primary Care Networks (PCNs) and municipal recreation authorities to tailor programs aimed at enhancing human health and well-being (e.g., Edmonton's "Prescription to Get Active" program). Finally, it is important to emphasize that an opportunity for the Parks Division may exist if the value of the health benefits of contact with nature is recognized as a funding priority within the health dimension of public policy. This would represent a major paradigm shift in Alberta, as protected areas programmes have typically been funded within the tourism and recreation envelope of government (and/or via user fees), which offer much smaller pools of money than the health envelope. At the same time, this shift could provide the Parks Division with the financial, human, and scientific resources it requires to proactively advance the health and well-being agenda not only within the greater Division, but also within the province as a whole.

*"Parks need recognition for the essential role they play in preserving, maintaining, and promoting the health of the humans, as well as that of their environment".*  
(Maller et al., 2008, p. 21)

# HEALTHY OUTSIDE/HEALTHY INSIDE



Regarding the Park Division's protected area professionals, their management actions could be undertaken with the double objective of facilitating both ecological health and human health outcomes. In fact, this study reveals that the parks are already providing high levels of positive health benefits. This now needs to be incorporated more fully into policy. First, ways that visitors' quality of life is enhanced through opportunities for interaction with nature should be incorporated into site-specific management plans for all Provincial Parks and Provincial Recreation Areas. Second, outreach and communication strategies focused on promoting the role of parks in enhancing human health and well-being could be developed in collaboration with health professionals. Managers could also develop leisure activities focused on maximizing different health and well-being benefits within the context of different genders, sub-populations groups (e.g., youth, elderly, couples), and physical capabilities. Third, managers could educate visitors about the potential benefits they may generate as a result of visiting a particular park. As new park users become more familiar with the personal benefits of spending time in natural areas, they are likely to develop both a strong connection with their favourite park(s), as well as a conservation motive. The numerous physical and mental health benefits derived from nature contact serve as intrinsic motivation to continue parks visits. Indeed, regular park visitors are ambassadors who encourage an ethos of sustainability among others and contribute to parks in volunteer or other capacities.

Furthermore, the need for better access to nature for Alberta's urban populations may best be looked at as an

opportunity for land-use planners to establish protected areas closer to urban boundaries, or for the Parks Division to improve parks facilities and accessibility in order to foster public health activities at these sites (e.g., see the Parkbus program which transports people from major urban centres including Toronto and Ottawa to various provincial parks in Ontario). These actions may indirectly facilitate the public use of Alberta's protected areas. They are also a way to make them socially and economically profitable, because the range of activities and experiences they provide are typically not available in urbanized areas. In this sense, the promotion of parks and protected areas as a positive health resource is a win-win scenario, beneficial both for Alberta's protected areas (a way of generating income) and society (a way to improving health and well-being in leisure time).

Best practices in encouraging people to make use of the outdoors and nature to improve human health and well-being are being developed and implemented worldwide. Indeed, there are many examples that the Parks Division can draw from (e.g., Bell et al. 2011; Drakou et al. 2011; Senior and Townsend 2010). The most internationally well-known program in this regard is the Australian initiative entitled: "Healthy Parks, Healthy People". The program, introduced in 1999 by Parks Victoria (the agency in charge of the management of the protected areas in the State of Victoria, Australia), is based on the premise that individual and collective health depends on a healthy parks system, and that a healthy parks system is integrally linked to the value placed on it by the community. The program's success led to the creation of "Healthy Parks, Healthy People Global" (HPPH Global); a not-for-profit social enterprise dedicated to spreading the HPPH message at an international scale (Healthy Parks Healthy People, 2010).

More recently, policy and research initiatives have been initiated in a limited number of countries, including Canada [e.g., Canadian Parks Council's "Healthy by Nature" (2006) and "Connecting Canadians with Nature" (2013) initiatives] and the U.S. ["America's

*"Alberta's parks and protected areas should be viewed as a positive health resource and better incorporated into strategic policy within the Department, including Alberta's Land-Use Framework (Government of Alberta, 2008) and Plan for Parks (Government of Alberta, 2009)."*





Great Outdoors” initiative (Salavar et al., 2011)]. Despite these efforts, however, the U.S. National Park Service’s strategic action plan “Healthy Parks, Healthy People U.S.” remains the only strategic policy implemented by any government in this area (National Park Service 2011, 2013).

## RESEARCH NEEDS/STRATEGIC POLICY AND MANAGEMENT PROSPECTS

The new *Science Strategy* for Alberta Parks elaborates on the role of research in decision-making (Government of Alberta, 2010). Broadly speaking, there is a clear need for the Parks Division to better understand the impact of various land-use planning and conservation initiatives on the health of visitors and the livelihoods of different communities located in close proximity to protected areas. This should undoubtedly be one of the top research questions for Alberta Parks. As Lemieux et al. (2012, p. 82) emphasized, “increased levels of health research can help protected area practitioners and public health authorities more systematically address the health potential of protected areas, and better ensure that informed decisions are made in all areas of the health system including treatment, prevention, public programme and policy development”.

The U.S. National Park Service’s Healthy Parks Healthy People (HPHP) *Science Plan* recently introduced three general research goals specifically related to parks and protected areas:

- 1) Demonstrate that parks and public lands are sources of health benefits;
- 2) Inform the design and implementation of effective park policies, programs, facilities, and environments related to health; and
- 3) Quantify the health benefits of park experiences as a benchmark to improve the health impact of parks (National Park Service, 2013).

In relation to the latter, if motivations, expectations and perceived benefits from visitors are better known, and if cost-savings to the health system can be better quantified, it will be much easier to attract increased investment in conservation and to provide strategic advice on the effective management of Alberta’s parks and protected areas in relation to public health policies. Furthermore, a critical research gap is the potential of protected areas as mechanisms for engaging members of the community who have disabilities. Indeed, a number of inclusion and accessibility initiatives projects are already being implemented in several parks, under the objectives of the “Everyone Belongs Outside” strategic plan (Government of Alberta, 2014). Overall, without analysis of the impacts of various benefits that protected areas provide, there will be limited opportunity for promotion of protected areas as a mechanism to improve population health in Alberta communities.

In light of the above, we present a number of research, policy-oriented, and BBM recommendations and prospects for consideration by the Parks Division, should managers decide that any “repositioning” is necessary (e.g., ‘psychological repositioning’ within the agency, ‘real repositioning’ such as the development of new services focused on providing benefits). These recommendations are systematically organized under the various policy and management planning and program areas of the Parks Division.



## Strategic Policy and Planning

1. Consider developing a strategic and corporate “benefits-based management” policy, inclusive of human health and well-being benefits, to provide sufficient direction for planning and management.
2. Consider developing a more explicit mandate related to conservation and benefits-based management, including human health and well-being.
3. Consider developing a “business case” for health and well-being promotion in parks.
4. Strive for greater coordination with other Divisions and Departments in their efforts to enhance health and well-being benefits.

## Management Direction

1. Consider developing a corporate statement/position on human health and well-being in order to provide staff with direction and guidance on related planning and “benefits-based management” issues.
2. Consider incorporating long-term trends analysis into management plans to help guide longer-term actions and priorities pertaining to human health and well-being at the park level.
3. Consider embracing an evidence-based adaptive management approach to better deal with human health and well-being issues, as per the Science Plan.

## Research, Monitoring and Reporting

1. Consider working towards a better understanding of the health and well-being motivations of different social and population subgroups (e.g., youth, elderly, couples, etc.) so that evidence-based policies and programs in support of both biodiversity and human health and well-being can be developed.
2. Consider developing an integrated and cooperative research and monitoring strategy/plan to detect and monitor trends and impacts of various park landscapes/features on human health and well-being.
  - Consider developing comprehensive research strategy and monitoring framework with a defined set of indicators (with sufficient spatial and temporal considerations) pertaining to human health and well-being at both the system and park level to track changes and its effects for comparative reporting purposes.
  - Consider ongoing assessment of park visitors' connection to nature (and to specific parks) in order to evaluate the characteristics of frequent visitors and identify the potential psychological barriers to park use within the population.
  - Consider developing monitoring efforts that are coordinated across jurisdictions and with other organizations and partners (i.e., standardize indicators, protocols, etc.) to enable seamless roll-ups, assessment, and reporting of time-trend data.
  - Consider using the indicators to assess the successes and challenges of specific management plans.
3. Incorporate aspects of human health and well-being in its annual “Camper Satisfaction Survey”.
4. Incorporate aspects of human health and well-being in “State of the Park” reporting.
5. Communicate the health and happiness benefits associated with parks to the public, at large.



## Corporate Culture and Function

1. Consider establishing a social science section in order to promote research to improve understanding, planning, management and decision-making for parks and protected areas and “benefits-based management” including health and well-being.
2. Consider developing an education program/training session to address human health and well-being and related topics for all levels of park staff so that staff can use it in their daily work:
  - The contents of an education program could focus on: (1) current science; (2) potential impacts; (3) potential management objectives; and (4) the role of employees in implementing management objectives.
3. Consider cultivating a system-wide “ethos of conservation and well-being” in order to address management issues pertaining to human health and well-being and so that staff can become models of positive action.
4. Consider working towards building partnerships and leveraging resources in support of human health and well-being initiatives in support of its mandate.

## Operations and Development

1. Consider developing “best practice” guidelines to help facilitate experiences that enhance human health and well-being in protected areas.
2. Consider building, operating and maintaining facilities and infrastructure that facilitate human health and well-being-related activities where appropriate.
3. Consider the unique roles played by each park in providing health and well-being benefits.
4. Explore ways in which access to parks can be optimized for visitors and local residents.
  - Place emphasis on improving access for populations who use parks infrequently (e.g., minorities, low income community residents) and other priority populations (e.g., youth, seniors).

## Education, Interpretation and Outreach

1. Consider integrating human health and well-being messaging into park interpretation programs, websites, social media, etc. to educate the public on relevant issues and to better connect Albertans to nature.
  - Statistically significant differences in motivations and outcomes by gender and park location suggest that management plans and marketing activities need to be tailored, for example, on a site-by-site basis taking into consideration both the biophysical characteristics of park landscapes (or places) and how visitors perceive and experience those landscapes (or place) from a health and well-being perspective. This will require further research to determine differences at other park sites.
2. Consider developing public education programs with standardized messaging to help recognize, promote, monitor and report on human health and well-being issues related to protected areas.
3. When developing programs, the Parks Division should consider the various differences in health and well-being motivations and benefits associated with different user characteristics.
4. Consider providing visitors with healthy lifestyle ideas and conservation-oriented activities that they can act on themselves.
5. Consider leading the development of a “Partner Innovation Program” with government, non-government organizations, and other relevant organizations and individuals to address human health and well-being and protected areas issues.





## Education, Interpretation and Outreach (Continued)

6. Consider developing a conference or series of workshops across the province to bring together partners involved in conservation to discuss and learn from leading edge researchers and practitioners who have been considering human health and well-being, nature and protected areas, and how to integrate these interrelated issues into protected areas planning and management.
7. Continue the outreach program focused on connecting, in particular, youth and new Canadians to nature.
8. Consider developing a unified health and well-being communications and branding theme with evidence-based messaging.
9. Take advantage of opportunities to contact visitors who have motivations and benefits related to environmental well-being in order to further other objectives of provincial protected areas.

## Marketing

1. Examine how, in terms of marketing programs and visitor opportunities, the topics of health and well-being are received by current and potential park visitors.
2. Evaluate how other agencies and government departments address and incorporate the concepts of human health and well-being into their respective policy, planning, and management areas to identify where there are opportunities for collaboration / policy integration with Alberta Parks.

## CONCLUDING REMARKS

This research strongly demonstrates that Alberta's protected areas have individual health and well-being benefits, not the least of which is offering an escape from daily stresses, providing spaces for physical activity, and acting as a social outlet beyond people's everyday lives. As protected areas may be a key way of improving public health in Alberta, policy-makers should be focusing increased attention on the potential benefits associated with an expansion in Alberta's protected areas network. This study reveals that parks are very important providers of physical and mental health improvements for Alberta's citizens. The findings are so important that they should be brought to the attention of public health authorities, who might consider park visitation as part of the suite of public health initiatives funded by government.

In an era characterized by rapid socio-economic and environmental transformation, and generally less financial support for conservation, it will be increasingly important for The Government of Alberta's department of Environment and Sustainable Resource Development

- Parks Division to identify and implement programs that are society-oriented, and to develop outreach strategies that communicate this relevance to elected officials, key decision-makers, and the public. Such initiatives do not necessarily have to be the sole responsibility of the Parks Division, and can also be developed in association with other organizations working in support of conservation, health and well-being, and especially those involved with providing recreation and leisure experiences within protected areas.

Overall, the results of this study suggest that the social capital housed within Alberta's protected areas estate may deserve consideration alongside ecological capital in policy and management programs pertaining to conservation. While additional research is necessary to confirm if these findings are applicable more broadly, it is strongly recommended that the Parks Division begin and amplify the important and much needed process of adopting a "benefits-based management" agenda, and cultivating a health and well-being ethos within the corporate culture and function of the department.



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## Appendix A: The Healthy Outside-Healthy Inside Survey (Season 2)



### Welcome to the Alberta “Healthy Outside – Healthy Inside” Survey!

Dear Park Visitor,

The Department of Geography and Environmental Studies at Wilfrid Laurier University is conducting a study focusing on the health and well-being benefits of parks in Alberta. The University of Waterloo, Trent University, and the University of Alberta are also participating with the study.

We would greatly appreciate it if you would take a few moments to fill out this survey. **Your opinion is very important to us because it will help us in our efforts to improve our understanding of what activities people participate in during their visit and how this impacts their health and well-being.**

The survey takes about **15-20 minutes** and can be completed using either an Apple iPad or paper and pen. You may omit any question you prefer not to answer by leaving it blank and you may withdraw your participation by not submitting your responses.

To thank you for your help, after completing this survey you are eligible to **win one of three \$100 gift certificates to an outdoor equipment retailer of your choice**. Participation in this survey is voluntary and **anonymous**. You are not asked for your name or any identifying information. All information you provide will be considered confidential and responses to the survey questions will be summarized. Survey responses will be kept for a period of two years on a password protected computer at Wilfrid Laurier University, then erased. There are no known or anticipated risks to participation in this study.

If you have any questions about this study, or would like additional information to assist you in reaching a decision about participation, please feel free to speak with the researcher(s) here today. If at a later time you have questions about the study please contact Dr. Christopher Lemieux at [clemieux@wlu.ca](mailto:clemieux@wlu.ca). If you are interested in viewing the results of this survey, they will be posted on October 30, 2014 at <https://sites.google.com/site/cjlemieux>.

This study has been reviewed and received ethics clearance through the Office of Research Services at Wilfrid Laurier University in Ontario. We have also received permission from Alberta Parks to conduct the research in this park. However, the final decision about participation is yours. Should you have any comments or concerns resulting from your participation in this study, please contact Dr. R. Basso – [rbasso@wlu.ca](mailto:rbasso@wlu.ca) / 519-884-0710 x4994.

**Your opinions are very much appreciated and needed for this project! If you wish to participate in the survey, please begin the survey!**





## Appendix A continued

**SECTION 1: ABOUT YOUR VISIT****1. What is the total length of your visit to this park?**

- One day or less  
 > 1 day -- if more than one day please enter # of days \_\_\_\_\_

**2. Is this your first visit to this park?**  Yes  No

If **YES**, please skip to **Question 3**.

If **NO**, how many times have you visited this park in the past 12 months (including this visit)?

\_\_\_\_\_

In what year did you first visit this park? \_\_\_\_\_

**3. How many different parks have you visited personally in the past year (12 months)?** For this question, we would like you to consider parks in the broadest context that includes urban/suburban parks, municipal parks, national parks, provincial parks, etc.

\_\_\_\_\_

**4. Please identify the activities that you participated in during your visit to this park. Please only identify those activities that you did for at least 10 minutes at a time.**

- Resting / relaxing  
 Swimming / wading / beach activities  
 Motorboating / waterskiing / jet skiing  
 Driving for sightseeing / pleasure  
 Hiking - self-guided walks  
 Hiking - guided walks  
 Canoeing / Kayaking  
 Sailing / windsurfing  
 Bicycling  
 Fishing  
 Nature study - wildlife (e.g., looking for wildlife, birdwatching)  
 Nature study - plants (e.g., identifying wildflowers, trees)  
 Visiting historical / cultural features  
 Attending visitor education / interpretive programs  
 Using playground facilities  
 Visiting natural features / lookouts  
 Special events (e.g., festival, race)  
 Camping (tent)  
 Camping (RV or camper)  
 Reading



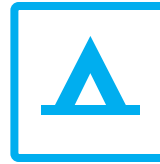
## Appendix A continued

- Cooking
- Campfire
- Playing music (with a musical instrument)
- Listening to music
- Watching television / playing video games
- Walking
- Socializing
- Photographing
- Horseback riding
- Recreation and leisure activities outside the park
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

## SECTION 2: YOUR VIEWS ABOUT NATURE

**1. For each of the following, please rate the extent to which you agree with each statement, using the scale as shown below.** Please respond as you really feel, rather than how you think “most people” feel.

	Disagree Strongly	Disagree a Little	Neither Agree or Disagree	Agree a Little	Agree Strongly
My ideal vacation spot would be a remote, wilderness area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I always think about how my actions affect the environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My connection to nature and the environment is a part of my spirituality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I take notice of wildlife wherever I am	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My relationship to nature is an important part of who I am	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I feel very connected to all living things and the earth	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



## Appendix A continued

### SECTION 3: HEALTH & WELL-BEING MOTIVATIONS & OUTCOMES

1. How important did each of the following health and well-being-related reasons play in your decision to visit this park? Please check one box for each reason that best represents your feeling on the scale.

	Not At All Important	Not Important	Somewhat Not Important	Neutral	Somewhat Important	Important	Very Important
<b>Physical Well-being</b> (for physical activity like hiking, swimming, canoeing, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Psychological/Emotional Well-being</b> (for restoration from mental fatigue, relaxation, solitude and quiet)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Social Well-being</b> (for opportunity for increased social interaction/ bonding with family, friends, and others)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Intellectual Well-being</b> (for opportunity to engage in creative and stimulating activities)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Spiritual Well-being</b> (to connect with nature, to be inspired by nature, to seek meaning and purpose of life)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Ecological Well-being</b> (to experience a sense of ecological citizenship, personal responsibility for conservation of natural resources)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Cultural Well-being</b> (to experience cultural and historical heritage)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Environmental Well-being</b> (to experience the physical environment, to appreciate the role the environment plays in life)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Occupational Well-being</b> (to improve my ability to work after my visit)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Financial Well-being</b> (relatively inexpensive recreational and leisure activity)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



# HEALTHY OUTSIDE/HEALTHY INSIDE



## Appendix A continued

**2. To what extent do you feel your visit to this park has impacted your general state of health and well-being in each of the following ways?** For each row item, check one box that best represents your feelings on the scale.

	Greatly Worsened	Worsened	Somewhat Worsened	Neutral	Somewhat Improved	Improved	Greatly Improved
<b>Physical Well-being</b> (from physical activity like hiking, swimming, canoeing, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Psychological/Emotional Well-being</b> (from restoration from mental fatigue, relaxation, solitude and quiet)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Social Well-being</b> (from increased social interaction/bonding with family, friends, and others)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Intellectual Well-being</b> (from engaging in creative and stimulating activities)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Spiritual Well-being</b> (from connecting with nature, being inspired by nature, seeking meaning and purpose of life)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Ecological Well-being</b> (from experiencing a sense of ecological citizenship, fulfilling personal responsibility for conservation of natural resources)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Cultural Well-being</b> (from experiencing cultural and historical heritage)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Environmental Well-being</b> (from experiencing the physical environment, appreciating the role the environment plays in life)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Occupational Well-being</b> (by improving my ability to work following my visit)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Financial Well-being</b> (by selecting a relatively inexpensive recreation and leisure activity)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



## Appendix A continued

### **SECTION 4: PHYSICAL HEALTH & WELL-BEING**

**1. In general, would you say your physical health is:**

- Excellent
- Very Good
- Good
- Fair
- Poor
- Don't Know

**2. In general, would you say your mental health is:**

- Excellent
- Very good
- Good
- Fair
- Poor
- Don't Know

**3. Thinking about the amount of stress in your life over the 7 days prior to your visit, would you say that most days were:**

- Not at all stressful
- Not very stressful
- A bit stressful
- Quite a bit stressful
- Extremely stressful
- Can't recall

**4. Below are five statements with which you may agree or disagree. Using the scale below, indicate your level of agreement with each item.**

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree or Disagree	Slightly Agree	Agree	Strongly Agree
In most ways my life is close to my ideal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The conditions of my life are excellent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am satisfied with life	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
So far I have gotten the important things I want in life	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I could live my life over, I would change almost nothing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



## Appendix A continued

### **SECTION 5: HEALTH AND WELL-BEING OF CHILDREN**

**1. Did any children 17 years of age and younger accompany you on this visit?**

Yes, # of children accompanying you: \_\_\_\_\_  No

**2. In your opinion, how important are visits to natural areas (such as parks) to improving the following characteristics of a child's health and well-being?**

	Not At All Important	Not Important	Somewhat Not Important	Neutral	Somewhat Important	Important	Very Important	Don't Know
Physical development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Social knowledge and competence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cognitive learning and language (e.g., concentration, observation and creativity)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Anxiety issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hyperactivity/Inattention issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Personal-social behavior (e.g., self-discipline, social interaction)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Respiratory issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### **SECTION 6: ABOUT YOU**

**1. In what year were you born?** \_\_\_\_\_

**2. Please select your gender:**  Male  Female

**3. How tall are you? Please use feet and inches:** \_\_\_\_\_

**4. How much do you weigh? Please use pounds:** \_\_\_\_\_

**5. Do you currently live in Canada?**  Yes  No

If **NO** to Question 5, please skip Questions 6 and 7.





## Appendix A continued

6. If YES to Question 5, do you currently live in Alberta?  Yes  No

7. If YES to Question 5, how long have you lived in Canada?

Entire life (e.g., Canadian citizen by birth)

OR \_\_\_\_\_ years

8. What is the highest degree, certificate or diploma you have obtained?

- No certificate, diploma or degree
- Secondary (high) school diploma or certificate
- Registered apprenticeship or trades certificate or diploma
- College, CEGEP or other non-university certificate or diploma
- University certificate or diploma below the bachelor level
- University certificate or diploma or degree at bachelor's level
- University certificate or diploma or degree above bachelor's level

9. What is your current employment status?

- Employed (work for pay or self-employed)
- Unemployed (without paid work or without self-employment work, and available for work)
- Not in the labour force (students, homemakers, retired workers, seasonal workers in an 'off' season, long term illness or disability)

10. What is your postal code (or zip code)? \_\_\_\_\_

11. What is your total household income from all sources before taxes in 2012?

- Less than \$10,000
- \$10,000 – \$29,999
- \$30,000 – \$49,000
- \$50,000 – \$69,999
- \$70,000 – \$89,000
- \$90,000 – \$109,000
- \$110,000 - \$129,999
- \$130,000 - \$149,999
- \$150,000 – \$169,999
- \$170,000 or more

**This is the end of the survey!**

**Thank-you for your participation!**

# HEALTHY OUTSIDE/HEALTHY INSIDE



## Appendix B: The Healthy Outside-Healthy Inside Poster (Summary of Results)



### HEALTHY OUTSIDE HEALTHY INSIDE

#### THE HEALTH & WELL-BEING BENEFITS OF ALBERTA'S PARKS & PROTECTED AREAS

Christopher J. Lemieux<sup>1</sup>, Sean T. Doherty<sup>1</sup>, Paul F. J. Eagles<sup>2</sup>, Joyce Gould<sup>3</sup>,  
Glen T. Hvenegaard<sup>4</sup>, Elizabeth (Lisa) Nisbet<sup>5</sup> and Mark W. Groulx<sup>6</sup>  
<sup>1</sup>Department of Geography and Environmental Studies, Wilfrid Laurier University  
<sup>2</sup>Department of Recreation and Leisure Studies, University of Waterloo  
<sup>3</sup>Alberta Environment and Sustainable Resource Development  
<sup>4</sup>Geography and Environmental Studies, University of Alberta  
<sup>5</sup>Psychology Department, Trent University  
<sup>6</sup>School of Planning, University of Waterloo

**INTRODUCTION** Canada's terrestrial protected areas at the provincial, territorial and national levels number more than 5,900, representing 9.6 per cent of the nation's total land base. Conservation objectives inscribed in legislation and related policy remain primarily ecologically-focused, and administrators predominantly direct management actions and focus 'state-of-the-resource' reporting on maximizing ecological health and biodiversity-related outcomes.

Despite the popularity of parks and other forms of protected areas as places to visit for recreation and leisure purposes (e.g., physical activity, relaxation and rejuvenation), and the large potential for promoting protected areas as places that support human health and well-being, scant research exists on the diverse perceived health and well-being motivations and benefits associated with visitation. Within this, there is also a lack of understanding of the potential management and policy interventions that could be developed to support healthy initiatives in Canada. *As such, the role that protected areas play in enhancing human health and well-being has not been fully recognized.* This poster highlights some of the results of a study that identified visitors' perceived health and well-being benefits associated with experiences provided by two provincial parks in Alberta, Canada.

#### STUDY SITES

##### Kananaskis Country



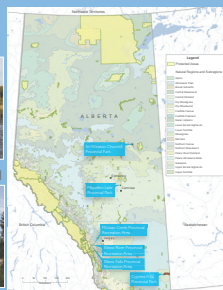
##### Miquelon Lake



##### Cypress Hills



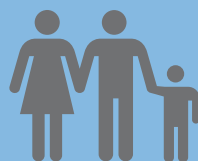
##### Sir Winston Churchill



#### METHODS

Surveying occurred in summers 2012 and 2013 in four locations: Cypress Hills Provincial Park, Kananaskis Country provincial recreation areas, Sir Winston Churchill Provincial Park and Miquelon Lake Provincial Park. Potential respondents were intercepted at various points (e.g., campsites, trails, and interpretive displays). The questionnaire was completed onsite using an Apple® iPad™ and iSurvey software. Descriptive statistical and correlation analysis was performed using SPSS.

Well-being benefits (outcomes of visitation) derived from visiting the parks were measured with a set of questions assessing the extent to which participants perceived visiting the park affected various aspects of their well-being (e.g., physical well-being, psychological/emotional well-being, social well-being) measured on a 7-point Likert-type scale (greatly worsened = 1, greatly improved = 7). Child development benefits were measured with a set of questions assessing the extent to which participants perceived visiting the parks affected various aspects of child health and well-being in general (e.g., physical development, social knowledge and competence, etc.) assessed on a 7-point Likert-type scale (strongly disagree = 1, strongly agree = 7).



#### DEMOGRAPHICS

1,515 visitors participated in the study. The sample included all adult age groups (avg age 43), is educated, and slightly over-represented by females (55%). Other characteristics of the total sample include a high proportion bringing children along (53%), with a mean of 1.5 accompanying children, an average BMI of 26.3 (over 25 is considered overweight; over 30 is considered obese) and very few non-residents of Canada (nearly 2%). Also, 82% of visitors were currently employed.

**“ To what extent do you agree that visiting parks improve the following characteristics of a child's health and well-being? ”**

##### Physical Development

**94%** agreed that park experiences improve the physical development of children

##### Social Knowledge & Competence

**93%** agreed that park experiences improve social knowledge & competence in children

##### Cognitive Learning & Language

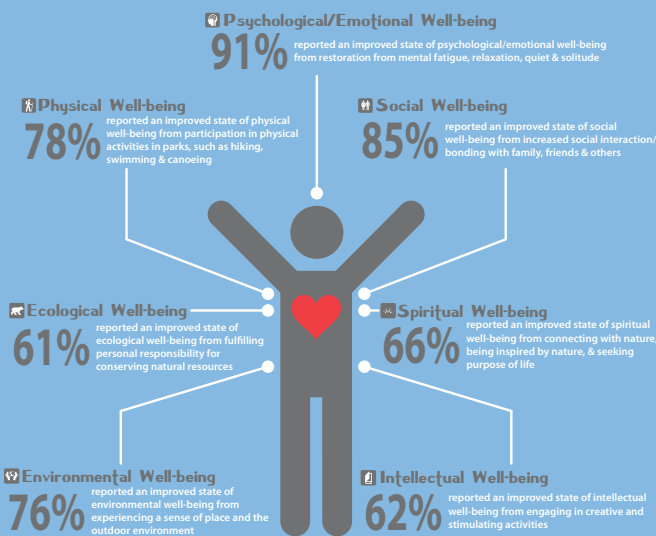
**87%** agreed that park experiences improve concentration, observation & creativity in children

##### Personal-social Behaviour

**88%** agreed that park experiences improve self-discipline and social interaction in children



**“ To what extent do you feel your visit to this park has impacted your general state of health and well-being in each of the following ways? ”**



**BEHIND THE NUMBERS** Overall, several significant trends were evident for age, gender, and education. Women perceived greater benefits than men associated with their visit, especially with respect to spiritual, social, psychological/emotional and financial well-being. The higher the income, the higher the perceived psychological and physical well-being benefits received. Older visitors perceived greater cultural, financial and economic well-being benefits, and lesser social, psychological, physical and occupational well-being benefits. More frequent visitors tend to be of better physical health, and perceive greater well-being benefits and outcomes associated with protected area visits. Visitors consistently and strongly perceived visits to parks as important for child development, regardless of the protected area visited.

#### SUMMARY OF FINDINGS



Results suggest that the human health and well-being benefits received from experiences provided by Alberta's parks and protected areas are substantial.



With 68% of responses associated with a health and well-being improvement, and only 2.3% associated with a perceived worsened state amongst all health and well-being attributes, the benefits received from park experiences are substantial, with physical, psychological/emotional, social and environmental benefits identified as the most significantly improved aspects.



The perceived health and well-being benefits associated with visitation suggest that the health and well-being, and indeed social capital, housed within parks and other forms of protected areas deserves increased consideration within visitor experience monitoring, management programmes and associated 'state-of-the-resource' reporting (e.g., 'State-of-the-Park' reporting).



There may be sufficient justification to include health and well-being and social capital objectives in ecosystem service assessments and strategic land-use planning exercises to provide additional compelling rationale towards national and even international conservation targets (such as Target 11 of the CBD Aichi Biodiversity Targets). This information can also be used to justify financial and political support for parks and protected areas in Alberta.



Park and public health agencies should work together to: (1) better understand how parks can be integrated into the health care system, both in terms of treatment and prevention; and, (2) develop communication strategies aimed at informing the public on how parks enhance the quality of life and environments for all Albertans and contribute to healthy communities.

**Acknowledgements:** This research was possible due to the gracious support of many people within Alberta Parks. Special thanks are extended to Don Carruthers Den Hoed, Dr. Matthew Wheatley, Roy Finzel, Peter Swain, Normand Durocher, and Lauren Zabel for assisting with park logistics and data collection. The many students from the University of Alberta, Wilfrid Laurier University, and the University of Waterloo are thanked for their assistance with data collection. **Disclaimer:** The views expressed in this poster do not necessarily represent the opinions of Alberta Parks, the department of Environment and Sustainable Development, or the Canadian Council on Ecological Areas.



**FOR MORE INFORMATION:**  
www.ccea.org



