Do Canadian's Leave No Trace? A study examining the pro-environmental behaviours of front-country and back-country overnight park visitors

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Introduction

Inherent in the term outdoor recreation is the interaction between humans and the natural environment. However, this interaction creates inevitable impacts on the natural environment, such as soil compaction and habitat fragmentation(Hammitt, Cole, & Monz, 2015). Some research has been done to investigate how back-country (BC) overnight visitors mitigate these negative impacts through low-impact camping practices, however little has been done on the millions of front-country (FC) overnight visitors. The purpose of this study was to understand the level of engagement in pro-environmental behviours of Canadian provincial parks users and compare those practices of FC and BC overnight visitors. Park visitors' knowledge of, intent to engage in and actual practice of Leave No Trace (LNT) practices were measured. Guided by value beliefs norm theory and the theory of planned behavior, additional factors that influence these visitors' engagement in pro-environmental practice were also measured(Ajzen, 1991; Stern, Dietz, Abel, Guagnano, & Kalof, 1999).

Background

Canadian provincial parks policies have a dual mandate of protecting provincially significant natural and cultural heritage resources while simultaneously providing sustainable recreation services to current and future generations (OMNR, 2011). Currently visitation to provincial parks in both Ontario and Alberta is over 8 million visitors annually. Of those visitors, over 2 million will stay overnight for a minimum of one night. With such high visitation numbers it is not surprising that provincial parks in Canada are experiencing resource degradation, habitat loss, and lasting environmental impacts (OMNR, 2011). In order to mitigate environmental impacts caused by outdoor recreation, park managers must employ multiple strategies, including both direct (e.g., rules and regulations) and indirect methods (e.g., education and interpretation programs) (Hammitt et al., 2015).

Education is viewed as an indirect management strategy for park and protected area mangers. The goal of environmental education is to change visitor's behaviours to be more environmentally sustainable. LNT is a widely accepted educational program that aims to reduce environmentally depreciative behaviours and promote responsible outdoor recreation through low-impact camping practices (Marion & Reid, 2001). While the principles taught by LNT were initially developed for the BC, the concepts can and are being applied to FC camping areas (areas accessible by car).

Methods

Study Site

The two parks examined were Algonquin Provincial Park (APP) in Ontario and Peter Lougheed Provincial Park (PLPP) in Alberta. These parks are culturally comparable, have high visitation numbers, offer similar BC and FC camping opportunities, and provide a broad representation of visitors to provincial parks in Canada. Within PLPP, there are 546 regular FC or auto access camp-grounds, two group campsites, twenty day-use areas, and 83 BC campsites.APP hosts over 2000km of BC canoe routes and hiking trails, includes over 1900 campsites total in both the FC and BC. In addition, APPhas an established formal relationship with LNT Canada and offers educational programming related to LNT, thereby enabling rich opportunities to compare impacts of information campaigns surrounding LNT. On the other hand, PLPP does not employ formal LNT materials or content, instead using in-house messaging to promote low-impact camping.

Methodology

A controlled comparison case study method was followed, as the goal was to compare the similarities and difference between both the two parks and user groups. Data was collected using a survey questionnaire administered on Android tablets and on paper. Surveys were collected at trail heads, campsites, permit offices, and visitor information centres. The scales included measurements of environmental values, attitudes, LNT understanding and knowledge, intention to practice LNT, ecological world views, and other factors relating to TPB and VBN Theory. Data was collected using convenience-based sampling and resulted in a sample of n=459, 230 visitors in Alberta and 229 in Ontario. Additionally, a follow up survey was emailed to participants intending to measure actual practice of LNT as a measure of behaviours, this survey resulted in a sample size of n=91. T-tests were run to determine if there were statistical differences between both user groups and parks with regard to self-reported LNT knowledge, actual LNT knowledge, and environmental world views. The p-value for statistical significance was set at .05.One-way analyses of variance (ANOVAs) were conducted with Tukey tests to examine the relationship between TPB and VBN variables on park visitors intentions to enagage in pro-environmental behaviours such as LNT. In addition, to determine if demographic variables, gender, income, and education play a role in the relationship between parks and user groups on the DVs: ecological world view and knowledge of LNT, ANCOVAS were conducted.

Results and Discussion

Results indicated a significant difference between FC and BC park visitors in terms of both self-reported knowledge of LNT (FC M=3.86; BC M=4.34, p.001 d=.319) and actual LNT knowledge (FC M=4.07; BC M= 3.93, p= .002, d=.302). It is important to note that while these findings are in line with previous research, suggesting BC users might have a higher level of self-reported knowledge, there is also a contradiction of this in the results of actual LNT knowledge. FC users scored higher levels of

actual knowledge when asked direct questions about LNT practices. Additionally, a significant difference was found in self-reported knowledge of LNT between the two parks (AB M= 4.38; ON M=3.67; p< .000, d = .479). Analysis of the TPB and VBN theory factors indicatedthat PEB intentions were best predicted by environmental values (β=.281), perceived behavioural control (β=.208), personal norms (β=.192), attitudes (β=.168), and awareness of consequences (β=.102) see table 1.

Table 1 Predicting pro-environmental behavioral intentions

Factor predicting PEB Intentions	β	Lower bound	Upper bound
Environmental values	.281	.203	.393
Perceived behavioural control	.208	.119	.262
Personal norms and beliefs	.192	.080	.243
Attitudes	.168	.085	.238
Awareness of consequences	. 102	.023	.163

Based on the findings of this study park visitors in Alberta have a higher knowledge of LNT practices than those who typically camp in Ontario. These results can be explained by a multitude of factors such as demographics, previous and current low-impact camping education/campaigns, and geographically location. The study participants in Alberta had a higher percentage of bachelor level and post graduate level degrees, as well as on average a higher household income. Stern et al.(1999) suggested that those with higher levels of education and income tend to have a more pro-environmental world view. These results also suggest that perhaps LNT as a brand is not as important or useful as previously believed. Algonquin Provincial Park has been implementing a LNT education campaign and using official logos and wording since 2012, whereas Alberta Parks uses generic low-impact camping information. Furthermore, it is interesting to note that it was the FC users who scored higher on the actual LNT awareness scale. LNT has widely been used for educating back-country users and has only recently been used in front-country areas. A better understanding of the environmental behaviours of FC overnight visitors will allow park managers to improve the efficiency and effectiveness of communication/education strategies targeting this group. Furthermore, understanding thefactors which are most important in motivating engagement inPEB, can further develop park programs that enhance visitors' knowledge of LNT and their commitment to engage in these practices.

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