

# Outdoor recreation participation in BC forest-dependent communities

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## ABSTRACT

Understanding recreation behaviour can help forest managers identify public uses of forests and gauge the extent of recreation use. This paper documents recreation behaviour in nine forest-dependent communities in British Columbia and examines three questions: (1) is outdoor recreation relevant to local residents?; (2) what are the characteristics of outdoor recreation participation?; and (3) are local residents satisfied with outdoor recreation forest management outcomes and land-use planning processes? Involvement in recreation activities was varied and longstanding. Non-motorized and motorized recreation played important roles as people's main connection to forests. Knowing about recreationists' satisfaction with land-use planning outcomes can help forest managers assess their success in meeting land-use objectives, and may help alleviate uncertainties in forest planning and management by reducing conflict, improving quality-of-life, and contributing to the social license of forestry activities.

**Key words:** forest recreation; sustainable forest management; recreation participation

## RÉSUMÉ

Comprendre les comportements récréatifs peut aider les gestionnaires forestiers à déterminer les utilisations publiques des forêts et à mesurer l'étendue de son utilisation à des fins récréatives. Cet article documente les comportements récréatifs au sein de neuf communautés dépendantes de la forêt en Colombie-Britannique et examine trois questions : (1) Les activités récréatives de plein air sont-elles applicables aux résidents locaux?; (2) Quelles sont les caractéristiques de la participation à des activités récréatives de plein air?; (3) Les résidents locaux sont-ils satisfaits des résultats de la gestion des forêts offrant des activités récréatives de plein air et des processus de planification de l'utilisation des terres? La participation à des activités récréatives était variée et de longue date. Les loisirs non motorisés et motorisés ont joué des rôles importants à titre de lien principal entre la population et les forêts. Avoir une idée de la satisfaction des adeptes des loisirs en plein air vis-à-vis les résultats de la planification de l'utilisation des terres peut aider les gestionnaires forestiers à évaluer dans quelle mesure ils réussissent à atteindre les objectifs en matière d'utilisation des terres et peut aider à atténuer les incertitudes entourant la planification et la gestion des forêts en réduisant le nombre de différends, en améliorant la qualité de vie et en contribuant au permis social des activités liées à la foresterie.

**Mots clés :** Récréation forestière; gestion durable des forêts; participation à des activités récréatives



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## Introduction

Sustainable forest management (SFM) is concerned with multiple values at multiple scales (Harshaw *et al.* 2007). Many SFM frameworks describe criteria and indicators suitable for measuring and monitoring values at large scales (e.g., CCFM 2003, FSC 2004), while others permit localization of broader standards to the local-level (e.g., CSA 2002). Although sustain-

ing ecological, economic, and social forest values are important at all scales, social values are particularly relevant at the community level: "where communities rely on forest land for their economic base, community sustainability is a desired outcome for forest management" (Beckley *et al.* 2002). However, social values that are relevant at the local level are not well understood (Nadeau *et al.* 1999, Beckley 2000, Parkins *et al.* 2004).

In an effort to address this gap, residents in nine forestry-dependent communities in British Columbia (BC) were surveyed about their opinions of local and provincial forest management issues in an effort to document local social characteristics, management preferences, and attitudes. The goal of this survey, the *BC SFM Public Opinion Survey*, was to inform public advisory groups of local residents' opinions and beliefs about SFM so that they could better represent their communities on a range of issues critical to forest management. A surprising result that was uncovered in the initial (six of nine communities) analysis of *BC SFM Public Opinion Survey* was that outdoor recreation (both non-motorized and motorized) was identified by most respondents as their main connection to forests, more so than forestry (Harshaw and Sheppard 2007). This suggested that the role that outdoor recreation played in the quality of life of rural British Columbians was perhaps more important than previously believed.

Although there have been several examinations of (1) the role that outdoor recreation plays in supporting nature-based tourism endeavours (e.g., Twynam and Robinson 1997, Hunt *et al.* 2005), (2) provincial and national participation in out-

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door recreation (e.g., Federal-Provincial-Territorial Task Force on the Importance of Nature to Canadians 1999), and (3) regional (i.e., place-based) outdoor recreation participation (e.g., McFarlane and Boxall 1996, Harshaw *et al.* 2006), our understanding of local-level recreation participation within a forestry context is lacking. In an attempt to document local outdoor recreation participation and to investigate the role that outdoor recreation played in the quality of life of rural British Columbians, this paper examines three broad questions:

- 1) Is outdoor recreation relevant to local residents?
- 2) What are the characteristics of outdoor recreation participation?
- 3) Are local residents satisfied with outdoor recreation forest management outcomes and land-use planning processes?

## Literature Review

Recreationists are not a homogeneous group (Bryan 1977, McIntyre and Pigram 1992, Manning 1999, Salz *et al.* 2001). Recreation participants differ in their values, the activities that they pursue, the settings that they prefer, the experiences they desire, and their motivations for participating. As "individuals participate in recreation activities to obtain certain experiences and fulfill specific needs" (Choi *et al.* 1994), understanding the motivations, needs and psychological desires of recreationists is important for the management of outdoor recreation and can help managers provide preferred settings (McFarlane 1994). The recreation setting is influenced by the management emphasis in that area, in terms of recreation experiences that are supported within that setting (Payne and Graham 1993). Although it is generally accepted that Crown forest lands ought to be managed such that ecological, social, and economic values are addressed, the balance of these values will differ according to the jurisdiction charged with managing them. In BC, recreation activities can take place in a variety of opportunity settings, each with a different recreation emphasis and management jurisdiction, including Provincial and National Parks, BC Ministry of Forests and Range (BCMoFR) recreation sites, private land, Crown land, and public waterways. Crown lands are managed for ecological, social, and economic values; the management direction comes from land use management plans and the degree of emphasis placed on recreation varies according to the importance of other values and resource availability (Haddock 1999).

Ditton *et al.* (1992) note that traditional social aggregation variables (e.g., occupation, income, age, education, place of residence) do not completely explain recreation participation. One way of addressing and understanding recreation participation is to measure it. Recreation experience has been seen to be an important concept for differentiating among recreationists and has been measured in terms of frequency of participation and years of participation. As recreationists' levels of experience increase, so too does their degree of knowledge about various aspects of the activity that they pursue; the differences in knowledge among recreationists with differing levels of experience may lead to differences in attitudes, preferences and behaviour (Scott and Shafer 2001). Measures of recreation experience have been found to be related to preferences for management settings (Manning 1999); understanding differences in recreation participation and experience can

assist in the identification and design of a diversity of recreation opportunities to meet the diverse demands of recreation participants (McFarlane 2001).

One of the guiding principles of outdoor recreation management is to provide high-quality experiences to recreationists; this has traditionally been measured in terms of visitor satisfaction (Manning 1999). Visitor satisfaction is a multidimensional concept, dependent upon resource, social and management settings, and is a subjective concept that is informed by (among other things) the socioeconomic characteristics and experiences of the recreationist. Understanding recreationists' satisfaction with land-use planning outcomes is important for managers to assess their success in meeting land-use objectives.

Past research has demonstrated that knowing about people's forest recreation behaviour can be helpful when trying to understand people's attitudes and preferences for forest management outcomes. For example, people that highly value recreation experiences have different attitudes toward visual quality than do people that rate economic values highly; but those that highly value recreation values have similar attitudes to people that value ecology and aesthetics highly (Tindall 2003). In their examination of the relationships between socioeconomic characteristics, social influence, forest knowledge, forest values, and forest management preferences among motorized and non-motorized recreationists, McFarlane and Boxall (2000) found that the type of recreation that people participated in had an effect on their attitudes and values. Participants of appreciative, or non-consumptive, activities were more likely to have biocentric attitudes than were participants of mechanized or consumptive activities.

Given the prominent role that public involvement has taken in forest planning and management, it is valuable to know how different forest stakeholders perceive the various opportunities available to them to become involved in deliberations about options for forest management. An important principle for land-use planning participants is the legitimacy of the process (i.e., it should be open, democratic, and transparent), independent of the planning outcome achieved. An important component of legitimacy is the representation of values, interests and concerns. By asking people how well they think that their interests or needs have been represented in forest land-use planning, we can begin to address how well these processes resonate with the public. However, it is important to distinguish between actual representation and perceived representation. When a person is asked how represented they feel, their response indicates perceived representation, or the degree of representation that a person believes has occurred. This is different from actual representation in several ways; for example, a person might have unreasonable expectations about the degree or quality of representation that is possible; limitations in communication and planning process attributes may influence the effectiveness of a stakeholder representative or proxy to convey the needs and desires of their constituency. Also, a person might not be aware of what has gone on in a particular planning process and consequently not be in a position to accurately gauge whether or not a representative was effective or not. With these considerations in mind, the degree that a person feels that their needs have been represented in land-use planning may also be influenced by their satisfaction with planning

decisions or outcomes and possibly, by extension, their ability to pursue certain recreation activities and opportunities in the settings that they desire (Harshaw 2005, Harshaw *et al.* 2006).

## Methods

A mail-out questionnaire was administered to residents of nine BC communities in order to solicit their opinions and beliefs about sustainable forest management. Working drafts of the questionnaire were reviewed by forest sector employees, representatives from forest certification public advisory groups, and academics. A pilot questionnaire was completed by members of Radium Hot Springs Public Advisory Group to identify difficult questions and to gauge the amount of time necessary to complete the questionnaire; the final questionnaire was a 12-page booklet. Although the questionnaire sought opinions and beliefs about a wide range of forest values and functions, the results reported here focus on recreation characteristics and opinions about forest recreation management. The methods employed for questionnaire design, sample selection, survey design, and analyses follow.

### Measuring outdoor recreation participation and importance

To address the first research question, *is outdoor recreation relevant to local residents*, data were analyzed about the duration of respondents' involvement with outdoor recreation activities, how central their most important outdoor recreation activities were to their lifestyles, and with whom respondents participated in forest recreation activities. Twenty-one categories of forest stakeholders (identified through a review of stakeholders typically represented by Public Advisory Groups) were presented to respondents, who were asked to identify their main connection to forests. Respondents could identify more than one connection.

To address the second research question, *what are the characteristics of outdoor recreation participation*, data were analyzed about respondents' most important recreation activity and the length of time that they have participated in it, the total number of recreation activities participated in, their preferred recreation setting (within the contexts of the recreation opportunity spectrum and management jurisdiction), and seasonal recreation participation. One source of information about recreation use and issues that forest managers make use of is outdoor recreation clubs (some outdoor recreation clubs have advocacy functions that seek to promote the issues and concerns of their members); respondents were asked to list the outdoor recreation clubs to which they belonged.

To address the third research question, *are local residents satisfied with outdoor recreation management outcomes and land-use planning processes*, items from five questions were assessed. (1) Respondents were asked to indicate whether they felt that their outdoor recreation needs had been represented in land-use planning using a five-point Likert scale: "how well do you think that your outdoor recreation needs have been represented in forest land-use planning in the area where you live"? (2) Respondents were also asked indicate the capability of several categories of organizations involved in land-use planning to represent recreation needs: "Please rank the following in terms of their ability to represent your outdoor recreation needs in land-use planning"; the categories of representation proxies that were presented to respondents were government, industry, outdoor recreation clubs, and

individual people (i.e., citizens). (3) Respondents were asked to indicate how satisfied they were with outdoor recreation management outcomes on a five-point Likert scale; satisfaction was assessed at the local scale and at the provincial scale. Respondents had the option of indicating that they did not know enough, or did not have an opinion about outdoor recreation management outcomes. (4) Using a five-point Likert scale, respondents were also asked to indicate how important it was that recreation resources, opportunities and experiences are maintained or enhanced. (5) Respondents were asked them to indicate their level of agreement with the statement, "forest roads that are no longer in use by the forestry companies should be deactivated, even if that means less access to remote areas," on a five-point Likert scale; respondents could indicate that they did not know enough, or did not have an opinion, about a particular statement.

Information was also collected about respondents' demographic characteristics, including age, gender, education, occupational sector, and household income.

### Sample selection

In order to establish that the sample broadly reflected the opinions of community residents, the sample frame was the general population of each community; every effort was made to maximize the return rate and achieve a 95% confidence interval for the results. A desired threshold for the number of returns was identified for each community. This threshold was based on community population size, the sample error that was associated with the population size, and an estimate of the response rate. The number of desired returned completed questionnaires, based on a varied population with a sample error of  $\pm 5\%$  at the 95% confidence level (i.e.,  $\pm 5\%$ , 19 times out of 20), was determined for each community (Salant and Dillman 1994). Final sample sizes for each community were based on an estimated 30% response rate. Community samples were developed through random selection of surnames from telephone directories; people that were not listed in the telephone directory were not included in the sample.

### Survey design

Questionnaires were mailed out to nine forest-dependent communities in British Columbia<sup>2</sup>: Fort Nelson, Fort St. John, Fort St. James, Houston, Mackenzie<sup>3</sup>, Prince George, Quesnel, Radium Hot Springs/Invermere, and Vanderhoof. The survey design followed the principles of the *Tailored Design Method*, which identifies procedures to maximize return rates and minimize sample error (Salant and Dillman 1994, Dillman 2000) in order to capture the broad range of opinions and beliefs typically found in communities, and to draw inferences for the communities. In keeping with the *Tailored Design Method* (Dillman 2000), a multiple contact approach was used to maximize response rates. Four contacts (an initial

<sup>2</sup>These communities were not randomly selected; they were communities where the study's proponent (Canadian Forest Products Ltd.) had operations.

<sup>3</sup>The Mackenzie sample included the outlying communities of McLeod Lake, Manson Creek, Geremansen Landing, and Tsay Keh Dene/Ft. Ware.

contact letter, a questionnaire, a reminder postcard, and a replacement questionnaire) were used for the communities of Ft. Nelson, Fort St. John, Ft. St. James, Prince George, Quesnel, and Radium Hot Springs/Invermere. In Houston, a large number of invalid mailing addresses<sup>4</sup> were identified after the initial contacts had been mailed, which necessitated redelivery; as a result, only two contacts (a questionnaire and a replacement questionnaire) were used for Houston. In an attempt to avoid the problem of invalid mailing addresses for the communities of Mackenzie and Vanderhoof, the sample was broadened to include everyone that had a post office box; three contacts (a questionnaire, a reminder postcard, and a replacement questionnaire) were made in these two communities. A total of 2750 responses were received between January 16, 2006 and March 29, 2007; this represents an overall response rate of 27.2% response rate after correcting for undeliverable addresses (Table 1).

### Analysis

Tests for non-response bias were conducted by comparing early and late respondents on a number of demographic and recreation variables. The mid-points for the date of questionnaire returns by community were identified and responses were then grouped as either early respondents or late respondents; this approach assumes that late respondents are similar to non-respondents (Armstrong and Overton 1977). T-tests were used to identify any differences between early and late respondents for age, length of recreation participation, number of recreation activities participated in, the centrality of recreation to respondents' lifestyles, annual and seasonal recreation participation, perceived representation of recreation needs in forest land-use planning; chi-square tests and nominal *post hoc* tests were calculated for gender, education, household income, and club membership.

Descriptive statistics were calculated for each question. For those questions that asked respondents to indicate their level of agreement, satisfaction, or importance, the proportion of responses was calculated for each interval. T-tests were used to identify if there was a difference between respondents' satisfaction with local and provincial forest management outcomes. Annual recreation participation was calculated as the aggregate number of times that a respondent reported participating in an outdoor recreation activity per month for each of the four seasons. The maximum monthly value was set at thirty; if a respondent's reported monthly outdoor recreation participation was greater than thirty, the value was replaced with the maximum value. Resultant participation rates for each of the four seasons were summed and multiplied by three (i.e., three months per season) to give an annual participation rate. AVOVA was used to test for differences between communities mean scores for questions; Levene's test for homogeneity of variance was calculated—if results indicate that variance among the community means are not equal, then the Welch and Brown-Forsythe statistics were employed to test for differences among mean scores (Field 2005). *Post hoc* tests were used to identify where differences lay. As the

<sup>4</sup>These invalid addresses were a consequence of attempting to mail to physical addresses (as found in telephone directories), which are not necessarily the same as mailing addresses in communities that use post office boxes for mail delivery.

sample sizes of the communities are not equal, the Scheffe test was employed for questions where responses between communities were homoscedastic. For questions where responses between communities were heteroscedastic, the Games-Howell test was used (Bluman 2004, Field 2005). Respondents' rankings of representatives that have the best abilities to represent their recreation needs in land-use planning were assessed using Kruskal-Wallis H tests (Zar 1998, Field 2005).

## Results

### Non-response bias

Although examinations of demographic and recreation characteristics of early and late respondents indicated several significant differences, the differences were small (Appendix 1). Thus, we can assume that there is little, if any non-response bias, in this analysis and inferences can be made to the communities.

### Demographic characteristics

The median age of respondents was older than the median age of community members, and the proportion of male respondents was higher than the proportion of male residents in each community (Statistics Canada 2003a, b, c, d, e, f, g, h, i, j). Respondents were generally well educated, as more than four out of five had completed high school. A range of occupations and occupational sectors and income levels was represented.

### Relevancy of outdoor recreation to local residents

Of the twenty-one options presented to respondents about their main connection to forests, the three most frequently cited connections were non-motorized recreation, followed by motorized recreation, and then forestry (Table 2); non-motorized and motorized recreation were the only connections to forests that the majority of respondents identified.

Respondents engaged in their most important recreation activity with a variety of people. Family and friends were cited most often (Table 3). A chi-square test of independence indicated that there was a weak significant difference between community of residence and respondents' usual choice of recreation partner ( $\chi^2 = 98.463$ ;  $df = 40$ ,  $p < 0.05$ , Cramer's  $V = 0.093$ ). For example, a higher proportion of respondents in Ft. St. John participated in recreation activities alone than did respondents in other communities; and a lower proportion of respondents in Ft. Nelson participated in recreation activities with family than did respondents in other communities (but a higher proportion of Ft. Nelson respondents participated in recreation activities with people from work than did respondents from other communities).

### Characteristics of outdoor recreation participation

Respondents ( $n = 2235$ ) reported participation in an average of  $4.4 \pm 0.2$  recreation activities ( $s = 3.893$ ). There was a significant difference of the mean number of recreation activities that respondents participated in between communities,  $F(8, 2232) = 3.450$ ,  $p < 0.05$ . Although the Levene statistic ( $2.392$ ,  $p < 0.05$ ) indicates that the variances of the mean responses for some communities were not equal, the Welch F Test ( $3.938$ ,  $p < 0.05$ ) confirmed these differences. The Games-Howell *post hoc* test revealed that the mean responses

**Table 1. Populations and sampling characteristics in six forest dependent of British Columbia.**

| Community                    | Population (2001) <sup>a</sup> | Target Sample Size <sup>b</sup> | Initial Sample <sup>c</sup> | Corrected Sample <sup>d</sup> | Number of Responses | Response Rate |
|------------------------------|--------------------------------|---------------------------------|-----------------------------|-------------------------------|---------------------|---------------|
| Ft. Nelson                   | 4188                           | 357                             | 1190                        | 521 <sup>e</sup>              | 131                 | 25.1%         |
| Ft. St. James                | 1927                           | 333                             | 1110                        | 581 <sup>f</sup>              | 176                 | 30.3%         |
| Ft. St. John                 | 17 781                         | 377                             | 1257                        | 998                           | 255                 | 25.6%         |
| Houston                      | 3575                           | 357                             | 1190                        | 1172                          | 310                 | 26.5%         |
| Mackenzie                    | 5454                           | 361                             | 2055                        | 2055                          | 236                 | 11.5%         |
| Prince George                | 85 035                         | 370                             | 1277                        | 1206                          | 401                 | 33.3%         |
| Quesnel                      | 10 044                         | 370                             | 1233                        | 1155                          | 452                 | 39.1%         |
| Radium Hot Springs/Invermere | 3441                           | 357                             | 1190                        | 939                           | 329                 | 35.0%         |
| Vanderhoof                   | 4727                           | 361                             | 2511                        | 2511                          | 460                 | 18.3%         |
| <b>Total</b>                 | <b>136 172</b>                 | <b>3243</b>                     | <b>13 013</b>               | <b>11 138</b>                 | <b>2750</b>         | <b>27.2%</b>  |

<sup>a</sup>2001 figures from Statistics Canada (2003a, b, c, d, e, f, g, h, i, j).

<sup>b</sup>Based on the population and precision required for 95% confidence interval (Salant and Dillman 1994).

<sup>c</sup>Based on an estimated 30% response rate.

<sup>d</sup>Corrected sample size after undeliverable questionnaires (invalid mailing addresses, respondents that had moved, respondents who were deceased, and respondents who were aged or of poor health and unable to complete the questionnaire) were taken into account.

<sup>e</sup>Sample size was reduced to 521 due to a lack of valid mailing addresses for community residents.

<sup>f</sup>Sample size was reduced to 581 due to a lack of valid mailing addresses for community residents.

**Table 2. What is your main connection to forests?**

| PAG Constituency           | n    | %     | 95% CI | s     |
|----------------------------|------|-------|--------|-------|
| Recreation (non-motorized) | 2658 | 65.4% | ± 3.5  | 0.476 |
| Recreation (motorized)     | 2659 | 52.4% | ± 3.7  | 0.500 |
| Forestry                   | 2659 | 44.8% | ± 3.7  | 0.497 |
| Environment                | 2658 | 32.1% | ± 3.4  | 0.467 |
| Photography                | 2660 | 23.3% | ± 3.1  | 0.423 |
| Ranching/agriculture       | 2659 | 16.7% | ± 2.7  | 0.373 |
| Tourism                    | 2660 | 16.4% | ± 2.7  | 0.370 |
| Small business             | 2659 | 16.1% | ± 2.7  | 0.368 |
| Education                  | 2660 | 14.4% | ± 2.6  | 0.351 |
| Oil and gas                | 2660 | 9.4%  | ± 2.2  | 0.291 |
| Non-timber forest products | 2660 | 8.9%  | ± 2.1  | 0.284 |
| Art                        | 2660 | 8.8%  | ± 2.1  | 0.284 |
| First Nations              | 2659 | 8.4%  | ± 2.0  | 0.278 |
| Provincial government      | 2660 | 7.9%  | ± 2.0  | 0.270 |
| Labour                     | 2659 | 7.6%  | ± 2.0  | 0.266 |
| Mining                     | 2660 | 7.4%  | ± 1.9  | 0.263 |
| Value-added sector         | 2658 | 6.2%  | ± 1.8  | 0.241 |
| Trapping                   | 2659 | 5.8%  | ± 1.7  | 0.234 |
| Local government           | 2660 | 5.6%  | ± 1.7  | 0.231 |
| Guide outfitter            | 2660 | 4.8%  | ± 1.6  | 0.214 |
| Utilities and transmission | 2660 | 1.2%  | ± 0.8  | 0.111 |

Note: As respondents could identify multiple settings, the percentage of respondents preferring settings is greater than 100%.

**Table 3. Who do you usually do your most important activity with? (n = 2273; s = 0.935)**

| Recreation Partner | %           |
|--------------------|-------------|
| Alone              | 12.1% ± 2.8 |
| Friends            | 34.3% ± 4.1 |
| Family             | 47.4% ± 4.3 |
| Club               | 1.7% ± 1.1  |
| People from work   | 1.1% ± 0.9  |
| Other              | 2.3% ± 1.3  |

**Table 4. Top ten forest recreation activities and mean length of participation (n = 2212).**

| Rank | Activity               | Length of Participation (years) |       |         |       |
|------|------------------------|---------------------------------|-------|---------|-------|
|      |                        | %                               | Mean  | 95% CI  | s     |
| 1    | Fishing                | 21.9%                           | 37.41 | ± 1.235 | 13.75 |
| 2    | Camping                | 19.0%                           | 30.29 | ± 1.333 | 13.84 |
| 3    | Hunting                | 13.7%                           | 34.86 | ± 1.548 | 13.65 |
| 4    | Hiking                 | 13.6%                           | 27.42 | ± 1.36  | 14.51 |
| 5    | Walking                | 5.2%                            | 29.44 | ± 3.371 | 18.09 |
| 6    | Skiing (general)       | 2.4%                            | 27.08 | ± 3.567 | 13.15 |
| 7    | Cross-country skiing   | 2.1%                            | 20.11 | ± 3.744 | 12.97 |
| 7    | Snowmobiling           | 2.1%                            | 19.89 | ± 3.097 | 10.84 |
| 8    | Boating                | 1.5%                            | 25.75 | ± 6.35  | 18.31 |
| 9    | Backcountry activities | 1.4%                            | 26.78 | ± 5.057 | 14.58 |
| 10   | ATV                    | 1.1%                            | 9.33  | ± 3.715 | 8.80  |

for Prince George ( $\bar{x}$  = 3.85) and Fort St. John ( $\bar{x}$  = 3.82) were significantly lower than the mean response for Radium Hot Springs/Invermere ( $\bar{x}$  = 4.93).

Respondents participated in a total of 34 recreation activities. Table 4 illustrates the ten most frequently identified activities and the mean length of participation for each activity. On the whole, respondents' involvement with their most important activity spanned many years: average involvement in activities ranged from 9.33 years (ATV) to 37.41 years (fishing).

Mean annual recreation participation for respondents (n = 1731) was 101.95 ± 3.86 days (s = 81.893), or almost twice a week; annual participation did not differ significantly between communities. Respondents participated in their most important recreation activity most often in summer ( $\bar{x}$  = 34.89) and least in the winter ( $\bar{x}$  = 15.6); mean participation was not significantly different between communities.

**Table 5. Environmental and jurisdictional setting use by recreationists.**

| Setting  | n    | %     | 95% CI | s     |
|--|------|-------|--------|-------|
| What setting(s) do you prefer for your most important activity?  |      |       |        |       |
| Large, undisturbed wilderness areas.                             | 2571 | 36.3% | ± 3.7  | 0.481 |
| Large wilderness areas with limited trails and camp-sites.       | 2572 | 51.5% | ± 3.8  | 0.500 |
| Semi-wilderness areas with limited motorized access.             | 2570 | 53.1% | ± 3.8  | 0.499 |
| Easily accessed natural areas with some facilities.              | 2572 | 51.2% | ± 3.8  | 0.500 |
| Rural areas.   | 2572 | 31.6% | ± 3.5  | 0.465 |
| Where do you most often engage in outdoor recreation activities? |      |       |        |       |
| Provincial Park  | 2573 | 60.0% | ± 3.7  | 0.490 |
| BCMoFR Recreation Site   | 2573 | 58.0% | ± 3.8  | 0.494 |
| Private Land   | 2573 | 43.2% | ± 3.8  | 0.495 |
| Crown land   | 2574 | 72.4% | ± 3.4  | 0.447 |
| Public water way   | 2574 | 57.4% | ± 3.8  | 0.495 |

Note: As respondents could identify multiple environmental and jurisdictional settings, the summed percentages are greater than 100%.

**Table 6. How well do you think that your outdoor recreation needs have been represented in forest land-use planning? (n = 2477; s = 1.149)**

| Degree of Representation   | %     |
|----------------------------|-------|
| Poorly represented (1)     | 10.3% |
| Slightly represented (2)   | 13.5% |
| Moderately represented (3) | 36.1% |
| Mostly represented (4)     | 26.4% |
| Well represented (5)       | 13.6% |

Respondents had engaged in recreation activities in a variety of environmental and jurisdictional settings (Table 5). Although semi-wilderness areas with limited motorized access were preferred by the largest proportion of respondents, other environmental settings played important roles. Crown land was identified as the setting most often used for recreation engagement (72.4%), followed by provincial parks and BCMoFR recreation sites.

**Satisfaction with outdoor recreation management outcomes and land-use planning processes**

Respondents reported that their recreation needs had been mostly to moderately represented in forest land-use planning in the areas where they lived ( $\bar{M} = 3.20 \pm 0.45$ ). Two in five respondents (40.0%) indicated that their recreation needs had been mostly or well represented, while less than one-quarter (23.8%) reported that their recreation needs had been poorly, or only slightly represented (Table 6). There were not any significant differences between communities for the mean degree of perceived representation for outdoor recreation needs.

In terms of the type of representative that had the best ability to represent their recreation needs in land-use planning, respondents reported that outdoor recreation clubs (36.1%) and government (34.6%) were best able to represent recreation needs (Fig. 1). There was a significant difference between communities in the mean rank that respondents

assigned to government's ability to represent their recreation needs in land-use planning ( $H = 17.306, p < 0.05$ ); however, the median test ( $\chi^2 = 15.025; df = 8, p < 0.05$ ) indicated that these differences were slight. There were also significant differences between communities in the mean rank assigned to ability of industry to represent recreation needs and to industry's ability ( $H = 31.218, p < 0.05$ ); however, the median test ( $\chi^2 = 26.634; df = 8, p < 0.05$ ) indicated that these differences were also slight.

Roughly one out of five respondents ( $21.6\% \pm 0.03$ ) of respondents ( $n = 2723$ ) reported being members of an outdoor recreation club ( $s = 3.236$ ). The proportion of respondents reporting club membership varied significantly by community ( $\chi^2 = 41.687; df = 8, p < 0.05$ ): club membership in Fort St. John, Prince George, and Vanderhoof was below the average; club membership in Fort Nelson, Mackenzie, and Radium Hot Springs/Invermere was above average.

Almost half of respondents (46.4%) felt somewhat or very satisfied with local forest recreation management outcomes, while just less than one-quarter (24.5%) of respondents indicated being somewhat or not at all satisfied with local outdoor recreation management outcomes. One-third of respondents (34.8%) felt somewhat or very satisfied with provincial forest recreation management outcomes, while just more than one-quarter (26.7%) of respondents indicated being somewhat or not at all satisfied with provincial outdoor recreation management outcomes.

The degrees of satisfaction that respondents indicated for local and provincial forest recreation management outcomes were moderately correlated ( $r = 0.719, p < 0.05$ ); however, the degree of satisfaction for local forest recreation management outcomes was significantly higher than the degree of satisfaction for provincial forest management outcomes ( $t(2301) = -11.005, p < 0.05; Fig. 2$ ). Although there were not any significant differences between communities for satisfaction with provincial-scale outdoor recreation, there were significant differences between communities with local satisfaction with local outdoor recreation  $F(8, 2572) = 3.220, p < 0.05$ . Although the Levene statistic (3.288,  $p < 0.05$ ) indicates that the variances of the mean responses for some communities

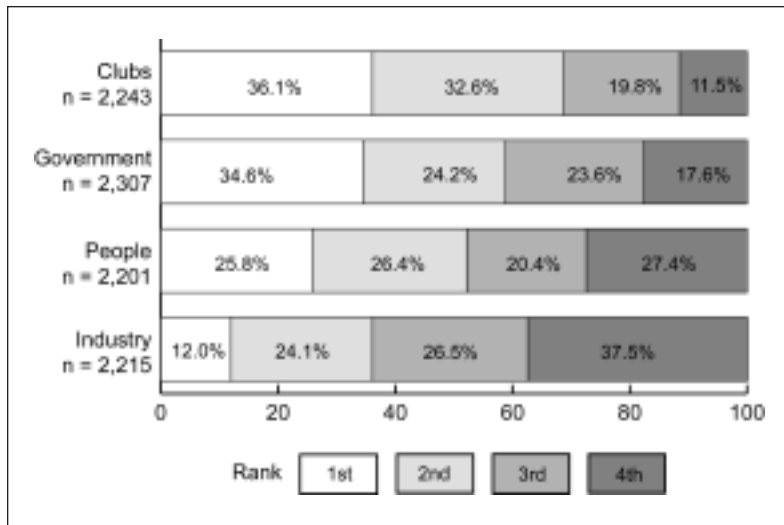


Fig. 1. Respondent ranking of representation proxies.

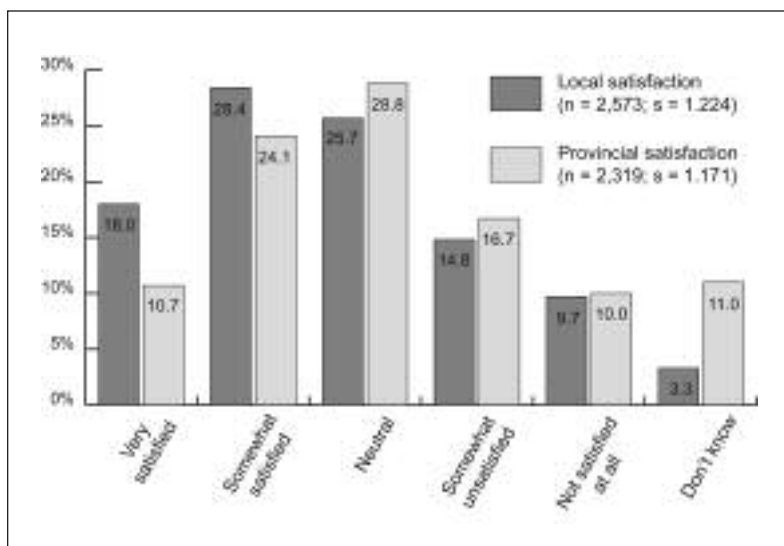


Fig. 2. Satisfaction with local and provincial forest recreation management outcomes.

were not equal, the Welch F Test (3.342,  $p < 0.05$ ) confirms the presence of the differences. The Games-Howell *post hoc* test revealed that the mean response for Fort St. John ( $\bar{x} = 2.95$ ) was significantly higher than the mean response for the communities of Houston ( $\bar{x} = 2.56$ ), Quesnel ( $\bar{x} = 2.59$ ), and Mackenzie ( $\bar{x} = 2.57$ ).

Respondents indicated that that maintaining or enhancing recreation resources, opportunities, and experiences was very important ( $\bar{x} = 2.07 \pm 0.04$ ). The majority of respondents (70.2%) indicated that maintaining or enhancing recreation resources, opportunities, and experiences was either *extremely* or *very important*; only 6.9% of respondents reported that this management objective was *slightly important* or *not important at all* (Table 7). There was not a significant difference between the mean responses of the nine communities in terms of the importance that they ascribed to the importance of maintaining or enhancing recreation resources, opportunities, and experiences.

Respondents were mixed in their agreement with the statement that forest roads that are no longer in use by

forestry companies should be deactivated, even if that means less access to remote areas. More respondents reported that they *mildly* or *strongly disagreed* (44.9%) with forest road deactivation in this context than did the percentage of respondents that *strongly* or *mostly agreed* (33.9%); see Table 8 for details. There was a significant difference between communities for the mean importance ascribed to the maintenance or enhancement of recreation resources, opportunities, and experiences  $F(8, 2599) = 3.026, p < 0.05$ . Although the Levene statistic (2.476,  $p < 0.05$ ) indicates that the variances of the mean responses for some communities were not equal, the Welch F Test (2.962,  $p < 0.05$ ) confirms the presence of the differences. The Games-Howell *post hoc* test revealed that the mean response for Fort St. John ( $\bar{x} = 2.95$ ) was significantly higher than the mean response for Vanderhoof ( $\bar{x} = 3.44$ ).

## Discussion

### Relevancy of outdoor recreation to local residents

It was not surprising that forest recreation was important to residents of timber-dependent communities; however, it was somewhat surprising that there were so few significant differences between communities for recreation characteristics. The majority of respondents reported that non-motorized and motorized recreation were their main connection to forests; outdoor recreation also represented the only voluntary (as opposed to work-related) connection that resonated with most respondents. Recognizing and fostering outdoor recreation in forest management could help to broaden people's perspectives of the values that forested landscapes provide to society. That the degree of importance that respondents accorded the maintenance or enhancement of recreation resources, opportunities, and experiences was very important across all communities

examined suggests that recreation not only ought to be included in forest management discussions, but that recreation resources be actively managed.

By explicitly incorporating forest recreation objectives into management and planning considerations, managers may be able to demonstrate that forestry is indeed more than just timber management. Knowing who local recreationists are (in terms of the activities that are pursued), where activities take place, and how often outdoor recreation activities are engaged in, can help to avoid potential conflicts between recreationists and forestry (e.g., forest road use) by working with recreationists to identify potential issues, forest managers may develop alternative recreation opportunities if existing recreation opportunities will be affected by forestry activities.

Results support previous research that suggested that recreation is an important vehicle for socialization (Stokowski 1990, Blackshaw and Long 1998, Putnam 2000) as family and friends played an important role in recreation participation, which may have implications for broader notions of quality-of-life. For example, by providing opportunities for socializa-

**Table 7. Importance of maintaining or enhancing recreation resources, opportunities and experiences (n = 2,631; s = 0.919)**

| Degree of Importance     | %     |
|--------------------------|-------|
| Extremely important (1)  | 29.0% |
| Very important (2)       | 41.2% |
| Moderately important (3) | 20.8% |
| Slightly important (4)   | 5.7%  |
| Not important at all (5) | 1.2%  |
| Don't know/No opinion    | 2.2%  |

**Table 8. Forest roads that are no longer in use by forestry companies should be deactivated, even if that means less access to remote areas (n = 2,600; s = 1.494)**

| Level of Agreement        | %     |
|---------------------------|-------|
| Strongly agree (1)        | 18.5% |
| Mostly agree (2)          | 15.4% |
| Partly agree/disagree (3) | 18.0% |
| Mildly disagree (4)       | 16.1% |
| Strongly disagree (5)     | 28.8% |
| Don't know/No opinion     | 3.1%  |

tion, recreation activities can help to foster community bonds by strengthening and developing the social networks between people. Strong social networks permit the creation and transfer of social capital (e.g., trust, information, social influence); social networks can serve as the foundation for strong, cohesive communities, which is an important aspect of quality-of-life. Social networks also help to promote civic engagement through socialization; within the context of forestry, increasing civic engagement may help to increase public involvement in deliberations about forest management. Recreation may also provide an initial, and common, focus for these deliberations.

#### Characteristics of outdoor recreation participation

Involvement in recreation activities among respondents was varied and longstanding. In addition to the 34 different outdoor recreation activities that were important to them, respondents' recreation participation was also varied in terms of the average number of activities that they participated in. Recreation participation spanned all four seasons and was frequent, as the average participation was roughly twice a week. This rate of recreation use is similar to the degree of recreation participation for British Columbians reported in the Nature Survey (Federal-Provincial-Territorial Task Force on the Importance of Nature to Canadians 1999), and underscores some of the logistical reasons for addressing recreation needs within the broader context of land-use planning.

Respondents' recreation characteristics and behaviour supports the principle that recreationists are not a homogeneous group—many different activities, settings, and degrees of engagement in recreation were evident. The diversity of the combinations of these characteristics of recreation use for forest management and planning suggests that the need to get input from recreation stakeholders that reflect local recreation use characteristics is an important consideration. A prior understanding of recreation use characteristics in plan-

ning areas is required in order to identify the appropriate representatives for recreation interests, and to identify where planning emphasis may lie for recreation interests. For example, Watson *et al.* (1991) argue that as people's involvement in recreation increases (indicated by characteristics such as length and frequency of participation, degree of centrality and skill), so too does their sensitivity to conflict, displacement from preferred locations, and feelings of dissatisfaction with recreation management.

Almost three-quarters of respondents pursued recreation activities on Crown land, the very places where forestry is practised. Recreation activities are not benign—both motorized and non-motorized activities can have ecological impacts, such as soil compaction and erosion, vegetation trampling, and the disruption of wildlife viability (Bowles 1995; Knight and Cole 1995a, b; Hammitt and Cole 1998; Havlick 2002). Motorized activities can have a greater risk of environmental pollution from exhaust, as well as the potential for fuel spills. The spatial distribution of these impacts is more extensive as motorized vehicles can travel farther and faster than human-powered recreation activities. Thus, there is a need for recreationists to recognize that forest tenures are working forests that support multiple values, including ecological and economic outcomes. However, forest managers need to recognize that other public uses are vying for some of the same resources. It may not be appropriate to expect that all recreation settings (e.g., from large undisturbed wilderness areas to easily accessed natural areas with some facilities) will be present on all tenures at all times; likewise, it may not be appropriate to expect that all of recreationists' needs can be met in parks and protected areas. For example, most parks and protected areas prohibit hunting and motorized recreation (e.g., snowmobiles and ATVs) within their boundaries, yet some of the people that engage in these activities may prefer remote settings. Crown lands may be the only areas that are accessible to them. It may be that there are sufficient numbers of people engaging in recreation in a variety of settings to support the management of recreation across a variety of jurisdictional actors and institutions.

#### Satisfaction with outdoor recreation management outcomes and land-use planning processes

On the whole, respondents indicated that their recreation needs had been represented in local forest land-use planning, and that government and recreation clubs were best suited to act as representatives for recreation (although only about one-quarter of respondents were members of a recreation club). It is striking that industry ranked so poorly, as industry plays such a large role in forest management. Despite the relatively high degree of perceived representation of recreation needs, respondents' satisfaction with local and provincial recreation management is less than desirable. Satisfaction with recreation management outcomes did differ between some of the communities, and between local and provincial scales. This suggests that some areas may be addressing outdoor recreation better than others. It also suggests that lessons could be learned from those areas where satisfaction with recreation management outcomes is higher. Reported satisfaction levels should be taken seriously, as respondents' recreation behaviour suggests that they are knowledgeable about the recreation opportunities in their area and are fairly active in their participation.

As Manning (1999) notes, satisfaction is a multidimensional concept that is influenced by a number of variables—not all of which are within the control of forest managers. Follow-up studies could examine which management outcomes are satisfactory and which are not; one might expect that two-way learning could occur as forest managers learn more about recreationists' expectations and recreationists learn more about the complexities of forest management.

A principle of recreation management is that providing a diversity of outdoor recreation opportunities across the landscape provides forest management with greater flexibility to respond to changes in demand for outdoor recreation experiences over time (Clark and Stankey 1979, Manning 1999). In addition to supporting this future option benefit, having a diversity of recreation settings is a desirable management objective in the nine communities examined here, as recreation activities were engaged in a variety of landscape settings from wilderness areas to rural areas—over half of respondents preferred semi-wilderness areas with limited motorized access as well as easily accessed natural areas with some facilities; almost half of respondents preferred large wilderness areas with limited trails and camp sites; further, one-third preferred large, undisturbed wilderness areas. The management implications of these setting preferences are that a range of access is required (which may help to inform road deactivation scheduling and extent), and that different infrastructure requirements are required (both to support recreation use and to shield sensitive areas from recreation use). The implementation of the *Recreation Opportunity Spectrum* in BC (BC Ministry of Forests Forest Practices Branch 1998) recognizes differences between the needs and motivations of motorized and non-motorized recreationists, and uses party size and the number of social encounters that could be expected as indicators of the differences in social expectations of the seven recreation setting classes. In addition to the differing needs and motivations of motorized and non-motorized recreationists, there are also differences in recreationist characteristics and opinions about forest management based on motivations and needs. A common means of identifying these opinions was to ask local recreation clubs for assistance. Although there was fairly broad support for outdoor recreation clubs to represent respondents' outdoor recreation needs, membership in outdoor recreation clubs among respondents was low—roughly one in five respondents were members of a club. Outdoor recreation clubs cannot be expected to represent the views of non-members, as they might not be known. This may pose problems to forest managers and planners, as clubs have served as an important source of information about recreation participation and concerns. Other mechanisms for soliciting input from recreationists, such as trailhead surveys, need to be considered.

## Conclusion

Fostering dialogue between recreationists and forest managers is important for realizing the multiple values supported by forested landscapes. Recreationists constitute a large and active forest stakeholder. Although outdoor recreation clubs are an easily accessed pool of recreation stakeholders, it is important to engage non-club members to ensure that a diversity of opinions and preferences are included in planning discussions. The use of social science tools, such as surveys, can compliment existing approaches for soliciting stake-

holder input (Beckley *et al.* 1999), and may provide greater flexibility in terms of allowing recreationists to choose when to provide input. Portability is essential so that people can provide input when it is convenient for them. Although all forest stakeholders face unique challenges, the outdoor recreation constituency has a particularly severe constraint on its involvement in deliberations about forest management and planning: discretionary time. Unlike some stakeholder groups concerned with their livelihood or day-to-day concerns, recreation interests are specifically concerned with their use of discretionary time. There is, therefore, a built-in competition between using their discretionary time for recreation and using it for participating in processes to protect their interests. Although mail surveys are good for soliciting the attitudes, beliefs and preferences of local communities (an important consideration in planning and management), recreation can also attract visitors to an area. To properly address visitor opinions and behaviours mail surveys should be complimented with on-the-ground surveys of recreation participation that incorporate an on-site exit poll of tourists and recreationists at key local attractions.

Recreationists are an important and large constituency in forest management. The number of respondents that indicated that recreation was their main connection to forests suggests that forests are more than sources of fibre, and that other uses of forests are supported. Opportunities for forest recreation should be enhanced and maintained. The majority of respondents experience forested landscapes through the lens of outdoor recreation activities. By recognizing outdoor recreation as an important component of sustainable forest management, forest managers could demonstrate their commitment to non-timber resources and help local residents (and visitors) experience forests and forestry.

## Acknowledgements

The author appreciates the suggestions made by the two anonymous reviewers; these suggestions improved the focus of the paper. Funding for this project was provided by the British Columbia Forest Investment Account and administered through Canadian Forest Products Ltd. Funding for the writing of this article was provided by the Province of British Columbia through the Forest Investment Account – Forest Science Program (Project 071036). Stephen Sheppard, Rob Kozak, and Tom Maness of the UBC Department of Forest Resources Management were excellent collaborators on this research. Norman McIntyre of Lakehead University provided helpful advice in the development of the recreation questions. The research was coordinated by the Collaborative for Advanced Landscape Planning (CALP) at the University of British Columbia's Faculty of Forestry.

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## Appendix 1. Non-response Bias.

An examination of demographic characteristics for the combined sample of all nine communities indicated that the only significant difference between early and late respondents was for respondents' age ( $t(2641) = 5.262, p < 0.05$ ): the mean age of early respondents was 2.82 years older than late respondents. When the communities were examined individually there were significant differences between early and late respondents for age in the communities of Houston ( $t(293) = 3.644, p < 0.05$ ; the mean age of early respondents was 5.64 years older than late respondents), Quesnel ( $t(433) = 2.653, p < 0.05$ ; the mean age of early respondents was 3.47 years older than late respondents), Vanderhoof ( $t(449) = 2.148, p < 0.05$ ; the mean age of early respondents was 2.86 years older than late respondents), and Fort St. John ( $t(240) = 2.222, p < 0.05$ ; the mean age of early respondents was 4.28 years older than late respondents). There were significant differences between early and late respondents for several categories of household income in Vanderhoof ( $n = 405; \chi^2 = 20.546; df = 11, p < 0.05, \text{Cramer's } V = 0.225$ ). There were not any significant differences between early and late respondents for gender and education in individual communities.

When all communities are examined together, there were significant differences between early and late respondents for three of the recreation variables that were examined: the mean length of early respondents' involvement in their most important recreation activity was 2.11 years more than late respondents ( $t(2512) = 3.412, p < 0.05$ ); early respondents mean annual recreation was 9.30 days more than late respondents ( $t(1729) = 2.364, p < 0.05$ ); and early respondents mean summer recreation participation was 0.91 days more than late respondents ( $t(2161) = 2.368, p < 0.05$ ). When communities were examined individually, there was a significant, but small, difference in the number of recreation activities participated in for Prince George ( $t(316) = -2.199, p < 0.05$ ), as late respondents participated in an average of 0.032 more recreation activities than early respondents did. Early respondents in Mackenzie reported being slightly more satisfied with provincial outdoor recreation management outcomes (mean difference = 0.101) than late respondents ( $t(207) = -2.040, p < 0.05$ ). Early respondents in Quesnel reported being slightly more agreeable with forest road deactivation (mean difference = 0.422) than late respondents ( $t(429) = -3.040, p < 0.05$ ).