



How well are outdoor recreationists represented in forest land-use planning? Perceptions of recreationists in the Sea-to-Sky Corridor of British Columbia

H.W. Harshaw*, R.A. Kozak, S.R.J. Sheppard

*Collaborative for Advanced Landscape Planning, Faculty of Forestry, University of British Columbia,
2340-2424 Main Mall, Vancouver, BC, Canada V6T 1Z4*

Received 24 June 2004; received in revised form 8 June 2005; accepted 14 June 2005
Available online 11 August 2005

Abstract

The case of recreation in the Sea-to-Sky Corridor in British Columbia (BC) is used to explore the issue of the representation of outdoor recreation in forest landscape management. The widening array of outdoor recreation activities in high-use areas poses new challenges to the equitable participation of diverse recreation user groups in forest land-use planning. How well have past forest land-use planning exercises in BC represented the needs of the widening diversity of outdoor recreationists? How well represented do participants of newer outdoor recreation activities feel? Are participants in newer recreation activities being excluded from the planning process, or do participants in more established activities feel they are being squeezed out by newer, more high-profile recreation activities? Moreover, who should represent these diverse groups? In an initial attempt to explore these questions, this study measures outdoor recreationist perceptions of representation in forest land-use planning outcomes in the Sea-to-Sky Corridor. We examine the relationships between recreation characteristics and perceptions of representation in forest land-use planning. Moderate levels of perceived representation were found for most recreation groups, although some users seemed unclear about how well they were represented. The highest levels of perceived representation were found among mountain bikers and off-trail hikers. Mountaineers reported the lowest levels of perceived representation. The contributions of four categories of variables to perceived representation in land-use planning in the Sea-to-Sky Corridor were assessed: demographics, characteristics of recreation participation, involvement in recreation advocacy, and the location of recreation engagement. A logistic regression suggests that five variables contribute to explaining respondents' perceptions of representation in forest land-use planning: (1) household income; (2) membership in a recreation club; (3) the number of recreation activities engaged in; (4) annual participation rate; (5) location of recreation pursuit. The results of this study support five forest land-use planning strategies that may assist planners in increasing actual and perceived representation of forest recreationists.
© 2005 Elsevier B.V. All rights reserved.

Keywords: Outdoor recreation; Forest land-use planning; Public participation

* Corresponding author. Tel.: +1 604 786 3141; fax: +1 604 822 9106.
E-mail address: harshaw@interchange.ubc.ca (H.W. Harshaw).

1. Introduction

Outside of parks and protected areas, the needs of outdoor recreation in Canada have arguably been peripheral to forest land-use planning and inconsistently managed. However, as the management of forest land-use increasingly recognizes social values through the adoption of sustainable forest management, the management of outdoor recreation resources and benefits are becoming more formalized and integrated with other forest values. The sustainable forest management paradigm also incorporates a high degree of stakeholder participation into the decision-making processes (e.g. Canadian Standards Association, 2003; Forest Stewardship Council Canada Working Group, 2004). The combination of these two developments suggests that the interests of outdoor recreationists should be represented in forest land-use planning. The case of recreation in the Sea-to-Sky Corridor, a contentious and popular recreation destination in British Columbia, is used to explore the issue of the representation of outdoor recreation in forest land management.

Land-use planning processes that incorporate, and are responsive to, the full range of social values are integral to the sustainable management of forest land-use (Canadian Council of Forest Ministers, 2003). Helford (2000) has argued that land-use management must not only be accountable to the public; it ought also to be sensitive to, and incorporate local knowledge. In British Columbia (BC), there have been various attempts to represent industrial, commercial, residential, and recreational interests in forest land-use planning processes. While there have been examinations of provincial land-use planning processes (Duffy et al., 1998; McAllister, 1998; Robinson et al., 2001; Roseland et al., 1998; Wilson, 1998), the outcomes of these processes for recreation values and impacts on recreationists using the forest landbase are not well understood. Poor or inconsistent representation of recreationists in planning raises important issues of equity, and the perception that certain recreation user groups may not be well represented may be a pre-cursor to land-use conflict.

How well have past forest land-use planning exercises in BC represented the needs of the widening diversity of outdoor recreationists? For example, how well represented do participants of newer outdoor recreation activities feel? Are representatives of newer recreation activities being excluded from the planning process, or

do representatives of more established activities feel they are being squeezed out by newer, more high-profile recreation activities? Moreover, who should represent these diverse groups? In an initial attempt to explore these, and related, questions, this study measures outdoor recreation stakeholder satisfaction with forest land-use planning outcomes in the Sea-to-Sky Corridor between Vancouver and the Whistler area, as expressed by stakeholder perceptions regarding the representation of their needs in forest land-use planning processes. This study examines the relationships between recreation characteristics and perceptions of representation in forest land-use planning within the Sea-to-Sky Corridor.

The Sea-to-Sky Corridor between Vancouver and Whistler, BC, is characterized by a concentration of outdoor recreation opportunities, proximity to both urban and rural communities, and a variety of outdoor recreation activities in a forested setting. By any measure, the area provides some of the most important outdoor recreation resources and experiences in BC. The Sea-to-Sky is an apt descriptive moniker for this regional planning area; the moniker has also been adopted as a tourism brand for the area. The area rises from the shores of the Pacific Ocean to the heights of Mt. Garibaldi (2678 m) in the Coast Mountains.

One factor that will undoubtedly increase both visitor use in, and attention to, this already popular recreation destination is the 2010 Winter Olympics to be held in Vancouver and Whistler. An economic impact study suggests that the Olympics could attract an additional 4.29 million international visitors to the area between 2002 and 2020; this represents a potential 43% increase over the total provincial international visitors from 2000 levels (InterVISTAS Consulting, Inc., 2002). In order to accommodate increased visitor traffic, the Sea-to-Sky Highway is being upgraded in an effort to make the route both safer and faster. The increases in access and visitors would likely alter the current character of the area and the recreation opportunities found within it, as existing front-country recreation facilities may not have the capacities to absorb the increased number of visitors, given existing budgetary constraints on provincial parks and forest recreation sites in the Province. This adds to the importance of recreation stakeholder representation in forest land-use decision-making. Although a public referendum of Vancouver residents revealed that 64% of respon-

dents supported the Vancouver–Whistler Olympic bid (City of Vancouver, 2003), some of the forest land-use decisions regarding Olympic venues will require an understanding of current visitors' behaviours, preferences, and needs. For example, the proposed Whistler Nordic Centre in the Callaghan Valley is an area already experiencing user conflicts between snowmobilers and cross-country skiers.

2. Background and objectives

2.1. Representation and recreation

The multitude of economic, ecological, and social values in the Sea-to-Sky Corridor has provided challenges for planners and managers in the past. A number of forest land-use planning processes have sought solutions for resource management in the area at a variety of spatial scales, using both rational and transactive planning methods. Rational planning has been characterized as an “expert approach”, whereby professional planners identify goals and objectives to be met, as well as the means to achieve them. In contrast, transactive planning is a participatory approach that involves stakeholders at stages throughout the planning process (Payne and Graham, 1993). Within transactive planning processes, Gobster and Barro (2000) suggest that there are two levels of negotiation that occur among stakeholders: general conceptions of the plan must be formulated before specific issues are addressed. These two levels of negotiation must then be balanced with the vision of the planning agency.

An example of a rational planning process implemented in the Sea-to-Sky Corridor is the Whistler Local Resource Use Plan (LRUP) that was initiated in 1987. LRUPs are strategic planning processes that are carried out at the local level to address complex, or competing, resource issues related to specific integrated management objectives in parts of the provincial forest. LRUPs are approved by district or regional forest managers (Haddock, 1999). Examples of transactive planning processes in the area include the development of a rock climbing strategy for three area parks that involved the local rock climbing community (BC Parks/Sunshine Coast District and Volunteer Group of Climbers, no date) and the recent initiation of the Sea-to-Sky Land and Resource Management Plan (LRMP). An LRMP is a planning tool employed in BC that represents

a consensus-based, multiple-stakeholder approach to planning applied at sub-regional scales ranging from 1 to 6 million ha (Duffy et al., 1998; Haddock, 1999). The Sea-to-Sky LRMP was initiated in January of 2001 and involves representatives from industry, government, and the public. Two public outdoor recreation representatives have been selected for this process; one representing non-motorized activities, and one representing motorized activities. Other stakeholders with representatives in the process include energy, environment/conservation, forestry, labour, tourism providers, fish and wildlife, subsurface resources and aggregates, local elected officials, and agriculture (British Columbia Ministry of Sustainable Resource Management, no date).

The number of forest land-use management plans developed over the years results from the tensions between competing forest land-uses in the Sea-to-Sky Corridor (particularly between timber and outdoor recreation values). As recreation use in the area is expected to increase, together with tourism, the particular concerns and expectations of an growing variety of outdoor recreationists will become increasingly important considerations in forest land-use planning. For example, emergent recreation activities (particularly those that have been facilitated through advances in technology, such as mountain biking or hang gliding) have challenged park management in other jurisdictions (Rothman, 2004). Clearly, there is a need to gauge the success of forest land-use planning in the Sea-to-Sky Corridor in representing the values of the widening diversity of outdoor recreationists.

A number of factors may influence the representation of a person's outdoor recreation needs in land-use planning. For instance, the planning process and associated procedures for inviting public or stakeholder input constitute a key set of variables (Sheppard, 2003). However, various studies have related these factors to characteristics of the stakeholders themselves, both for the general population and, in a few cases, for recreationists. Overdeest (2000) examined whether the decision-making process employed in public involvement in the Nantahala National Forest in North Carolina was representative of public values and found that representation is more likely to be achieved if structural barriers to participation in the process can be overcome. People with lower incomes or little discretionary time are less able, and less likely, to become involved in land-

use planning exercises. It is likely that discretionary time and access to resources would constrain participation as these conditions have been found to affect the opportunities that people have for participating in outdoor recreation activities; [More and Stevens \(2000\)](#) found that people with lower incomes faced barriers to participation in recreation activities due to user-fees, equipment costs, and discretionary time.

Some park planners have also noted difficulties in engaging people with lower incomes in planning activities ([More and Stevens, 2000](#)). If forest land-use planning processes are to be representatives of the range of recreationists (and other stakeholders), then the processes ought to be accessible to recreationists and able to address socioeconomic barriers to participation. In a review of sociodemographic aspects of outdoor recreation, [Manning \(1999\)](#) concludes that while socioeconomic characteristics are generally not powerful predictors of recreation participation, gender can play a role in explaining differences in participation patterns. For example, women tend to participate in fewer activities than men, which may be a consequence of women having less discretionary time and income due to family obligations in addition to employment responsibilities. It is not unreasonable to extend these limitations to participation in land-use planning exercises as they typically occur during discretionary time and are unpaid.

Obviously, planning processes cannot expect to receive input from all recreationists. [Overdevest \(2000\)](#) discusses the advantages and disadvantages of the participatory democracy model, involving active engagement on issues by stakeholders directly, versus the representative democracy model, wherein representatives of public groups are more or less formally selected to act on behalf of their constituency. The representative democracy model characterizes the process used in the Sea-to-Sky LRMP, and indeed all LRMPs in BC. [Wondolleck et al. \(1996\)](#) identified the importance of fostering effective two-way communication between stakeholder representatives and their constituents in order to maintain focus on the group's goals and objectives and to formalize each representative's accountability to constituency. Yet, it should be noted that such accountability increases the time-demands of stakeholder representatives, and may require additional skills to be developed if representation is to be effective.

The degree to which the stakeholder representatives are effective can influence the perceived level of rep-

resentation that an individual has, as can the social organizational structures, which affect communication between representatives and the larger population of their constituents. While there have been few studies focusing on the role of recreation user groups and organizations within the larger set of stakeholder interests, [Gobster and Barro \(2000\)](#) observed the public input process in the creation of the master plan for Montrose Point in Lincoln Park in Chicago and noted the dynamic between bird watchers and historic preservationists; in another study, [Rothman \(2004\)](#) examined some of the challenges to recreation management in Golden Gate National Recreation Area, particularly those posed by emergent activities like hang gliding and mountain biking.

Another variable that may influence a person's perceptions of representation of recreation needs is exposure to, or likelihood of, experiencing conflict with other activities or recreationists. [Watson et al. \(1991\)](#) suggest that sensitivity to conflict increases with recreation specialization. Specialization can be linked to the degree of recreation experience that an individual has. As specialization and experience increase, so too does sensitivity to environmental change, conflict, and the likelihood that a person will be prone to displacement, perhaps with consequent feelings that their needs are not being considered in planning and management processes.

2.2. *The study area*

The Sea-to-Sky Corridor ([Fig. 1](#)) is the area in southwestern BC that is serviced by Highway 99, the Sea-to-Sky Highway. The Highway parallels Howe Sound from Vancouver to the town of Squamish, the self-styled "outdoor recreation capital of Canada", continues north through the Squamish Valley to the resort community of Whistler and on to the town of Pemberton; it covers approximately 146 km. The proximity of the Sea-to-Sky Corridor to Vancouver, with a large urban population of almost 2 million, contributes to the high level of recreation use that this area receives. This study focuses on the Sea-to-Sky Corridor from Murrin Provincial Park (71 km north of Vancouver) to Pemberton.

According to the latest available statistics, leisure activities were the primary purpose for 84% of non-resident overnight trips to the Vancouver Coast and

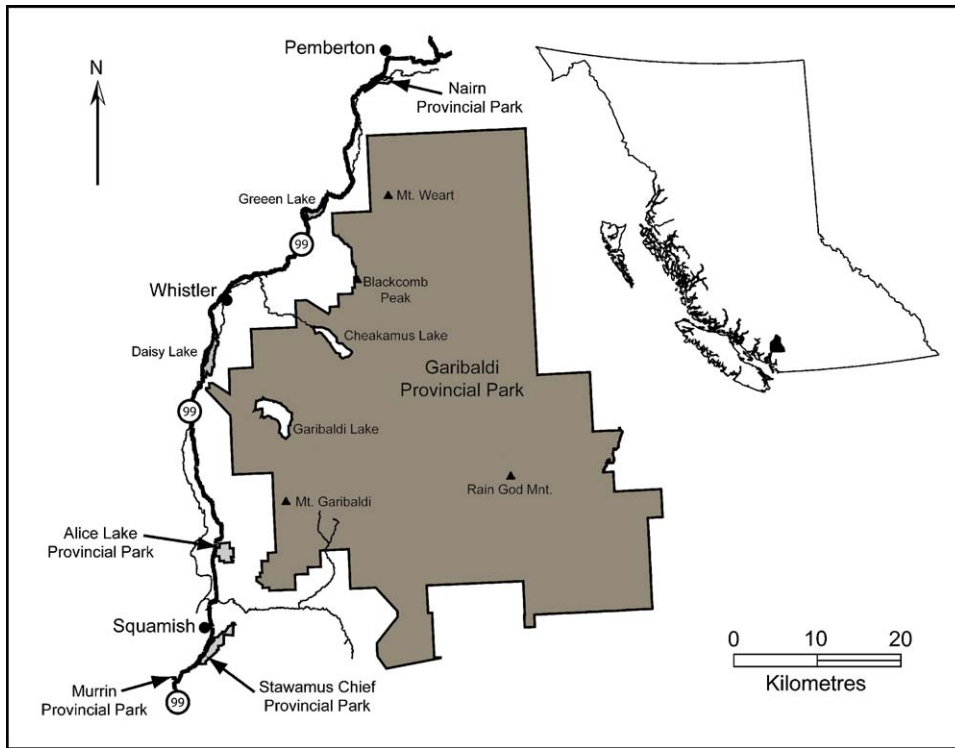


Fig. 1. Sea-to-Sky Corridor study area.

Mountains Tourism Region, of which the Sea-to-Sky Corridor is a part (BC Tourism, 1998). The Sea-to-Sky Corridor contains 11 provincial parks, ranging in size from the 24 ha Murrin Provincial Park to the 144,090 ha Garibaldi Provincial Park, and many other public forestlands that are accessible to recreation via Forest Service roads (Holman et al., 2001). There are also a wide variety of commercial recreation facilities. This diverse setting provides a range of front- and back-country recreation opportunities for sightseers, hikers, rock climbers, skiers, snowboarders, snowmobilers, mountain bikers, and white water kayakers. Tourism is the most important regional economic contributor in the Sea-to-Sky Corridor, attracting visitors from across North America, Asia, and Europe. One-quarter of all tourists to the area participate in outdoor recreation activities. Commercial snow sports and mountain biking at the resort community of Whistler are major attractions in the area; however, this study focuses primarily on recreation opportunities on public land. Recreation use in parks and on other public lands in the

area, both from local residents and tourists, is expected to continue to increase (Holman et al., 2001). Visitor statistics for the 11 provincial parks in the Sea-to-Sky Corridor indicate that 2,051,844 visitors participated in day use activities and 123,334 visitors participated in overnight camping activities in 1999 (British Columbia Ministry of Water, Land and Air Protection, no date). Visitor statistics for non-park land recreation use in the area are currently not available.

2.3. Research objectives

Given the lack of understanding of the relationships governing actual and perceived representation of recreationists in forest land-use planning, in this study we took a simple approach to measuring perceived representation levels and possible user characteristics associated with those levels. Respondents were asked: “Do you think that your outdoor recreation needs in the Sea-to-Sky Corridor have been represented in land-use planning?” We examined four categories of variables

to assess their contributions to perceived representation in land-use planning in the Sea-to-Sky Corridor: demographics, characteristics of recreation participation, involvement in recreation advocacy, and the location of recreation engagement.

3. Methods

3.1. Sample design

The survey instrument was developed using the principles of the Tailored Design Method, which identifies out procedures to maximize survey return rate and minimize survey error (Salant and Dillman, 1994; Dillman, 2000). The questionnaire and sample methods used in this study were pre-tested in a pilot study user survey conducted in the Slocan Valley area of British Columbia to identify potential problems with survey questions and methodological approaches. This led to a four-page on-site self-administered questionnaire that asked recreationists to detail their outdoor recreation behaviour (e.g. activity participation and importance, frequency and location of participation, club affiliation), recreation spending, involvement in forest land-use planning, and their perceptions of the representation of outdoor recreation in forest land-use planning. Questions on the latter topic addressed, among other things, the perceived ability of different groups (e.g. outdoor recreation clubs, government agencies, individual citizens, industry) to represent recreation interests, as many forest land-use planning exercises in BC use stakeholder representatives as proxies for different populations. Sociodemographic information was also collected.

People who were actively engaged, or about to become engaged, in an outdoor recreation activity at sample sites were asked to participate in the survey. All parties that arrived at a sample site were approached for inclusion in this study. Except where single-family parties were identified, all party members were asked to participate in the survey; when families were identified, only one member was asked to participate. While this sampling approach may introduce bias for variables associated with party size (e.g. travel cost), those variables are not considered in this paper. Respondents returned questionnaires on-site upon completion. An entry/exit intercept survey was selected, as there

were no comprehensive lists of outdoor recreation participants available for the study area (Dillman et al., 2002). The survey was administered at 12 sites in the Sea-to-Sky Corridor at trailheads, boat put-ins, and campsites at popular and significant outdoor recreation destinations during the winter of 2001/2002 (December 28–January 6) and the summer of 2002 (June 28–July 7, 2002). The two 10-day sample periods each included a regular workweek, a weekend, and a holiday weekend. Sampling took place between 08:00 a.m. and 02:00 p.m. Sample days at sample sites were randomly selected in order to capture a broad selection of outdoor recreationists (Gregoire and Buhyoff, 1999). Sample sites were selected through reconnaissance field trips to the study area, and information provided by recreationists, government planners, a review of previous studies, and local guidebooks (McLane, 1992; Macaree and Macaree, 1994, 1997; Mussio and Mussio, 1999; Clover Point Cartographics et al., 2000; Doug Leavers Consulting, 2000; Outdoor Recreation Council of BC, 2000). Sample sites were chosen to reflect a diversity of public outdoor recreation use in forested landscapes both in parks and on publicly owned land (i.e. Crown land) within the study area. Sites that charged user fees were excluded from sampling to avoid economic bias. Some provincial parks charged user fees for overnight stays; however, these sites did not charge for day-use recreation activities and were included as sample sites.

During the winter sample period, 173 people were encountered and approached, of which 131 agreed to participate in the study. During the summer sample period, 275 people were encountered and approached, of which 195 agreed to participate. The total number of questionnaire respondents was 326, for a response rate of 72.8%. A limitation of this study is the inability to establish the degree of non-response bias, as comprehensive outdoor recreation user statistics are not available to compare respondent encounter rates.

3.2. Descriptive analysis of survey results

Survey respondents provided information about the types and the importance of outdoor recreation activities that they participated in, the places at which they pursued these activities, and the frequency (in aggregate and by season) of their participation. The frequencies of responses for these different variables were calculated and ranked lists of activity-related charac-

teristics were derived as an exploratory technique for the subsequent logistic regression (see next section). The activity-related characteristics included: degree of recreation engagement, recreation advocacy involvement, and the location/jurisdiction of their recreation pursuits. Information on group travel expenses was also collected to provide data on respondents' recreation-related spending.

In order to address respondent involvement in outdoor recreation advocacy, respondents were asked to provide information about their participation in forest land-use planning and their reasons for (non-)participation. Respondents were asked to supply details of outdoor recreation club membership. They were also asked to indicate whether they felt that their outdoor recreation needs had been represented in forest land-use planning; this was collected as a binary measure. A binary measure was used as it permitted the use of logistic regression, which identified the odds ratios of contributing variables to perceptions of representation. While there is some loss of sensitivity with this method, posing a dichotomous choice to respondents forced a decision; however, some respondents declined to answer this question. The abilities of different groups to represent respondent recreation needs in forest land-use planning were ranked by respondents on a four-point ordinal scale. Demographic information was summarized. Univariate statistics were used to describe the sample in terms of the variables described above.

3.3. *Logistic regression analysis*

Logistic regression was used to determine the contribution of 14 independent variables to explaining perceptions of representation of outdoor recreation in forest land-use planning. Perceived representation, a binary measure, was used as the dependent variable in this analysis.

The independent variables were grouped into four categories: demographic; characteristics of recreation participation; involvement in recreation advocacy (club membership, participation in forest land-use planning); the locations of recreation participation. Demographic measures included age, household income, gender, and whether or not the respondent was an area resident. Gender and area of residence (local resident/non-local resident) were entered as binary categorical variables; household income was a categorical variable that used

\$10,000 increments. Recreation participation characteristics included the aggregate number of activities that respondents were engaged in during the past year, the number of recreation outings during the past year, and the respondent's expenses for their most recent recreation outing. The number of recreation outings during the past year is the aggregate number of times that a respondent reported participating in an outdoor recreation activity for each of the four seasons. Individual respondent expenses for their most recent recreation outing were calculated by dividing the reported group expenses for the respondent's travel group by the size of that group. Variables that indicated involvement in outdoor recreation advocacy were binary measures of participation in planning and club membership. Lastly, respondents were asked to indicate whether the locations of their recreation participation included provincial parks, Forest Service recreation sites, private land, Crown land, or public waterways; this information was coded as discrete categorical variables.

A Pearson's correlation was used to test whether linear relationships existed between the independent variables. All of the independent variables had Pearson correlations that were <0.7 , making them good candidates for logistic regression analysis (Tabachnick and Fidell, 2001). A Kolmogorov–Smirnov goodness-of-fit test indicated that few of the independent variables were normally distributed; however, the logistic regression procedure is free of assumptions about the distribution of the independent variables (Zar, 1984; Tabachnick and Fidell, 2001).

Two backward conditional logistic regression models were tested: one that included a constant (i.e. intercept) in the model and one that did not. The independent variables were entered into the model at $p < 0.05$ and were removed at $p < 0.10$ until the best fitting model was derived. The classification cut-off for model prediction was set at 0.5. Categorical variables used an indicator contrast to specify the presence or absence of membership in a category.

The suitability of the two candidate models was gauged using a number of diagnostics. Wald statistics were calculated in order to test the significance of each model coefficient. Cox and Snell R^2 and Nagelkerke R^2 values were also obtained. However, as R^2 values in logistic regression analysis do not assess how well a given model fits the data and are typically very low (Hosmer and Lemeshow, 2000), R^2 values were used

only to comparatively assess the two competing models in this analysis. Two additional summary statistics were employed to assess each of the candidate models, particularly differences between the observed and fitted values: (1) the -2 log likelihood chi-square statistic to indicate the amount of unexplained variation that exists after a model has been fitted and (2) the Hosmer and Lemeshow chi-square test to indicate a model's goodness-of-fit (Hosmer and Lemeshow, 2000). Tests of residuals were also conducted on each of the models to determine the number of outlying predicted values. Lastly, the overall model significance and the proportion of cases correctly classified was obtained for the two models.

4. Results

4.1. Sample characteristics

Over three-quarters of respondents (76.3%) were not residents of the Sea-to-Sky Corridor. Respondents reported being involved in an average of eight different outdoor recreation activities, and had participated in an outdoor recreation activity an average of 78 times in the previous year in the Sea-to-Sky Corridor. On their most recent outdoor recreation outing, respondents reported an average of \$52 in trip expenses. The majority of respondents' (77.1%) self-reported outdoor recreation activity occurred in provincial parks; however, this

could be due to the fact that 68.7% of respondents were in a park when they completed a questionnaire. Crown (public) land was the second highest area of outdoor recreation engagement (41.2%); 22.7% of respondents were at Crown land sites when they completed the questionnaire. Outdoor recreation occurrence at Forest Service recreation sites, private land, and public waterways was less than 25% in each of those types of settings (Table 1).

Three-quarters of the respondents were male and one-quarter of respondents were female. The majority of respondents indicated that they were younger than 40 years old. Respondent age reporting by category indicates that 6.9% were younger than 21, 39.7% were between ages 21 and 30, 31.2% were aged between 31 and 40, 14.8% were aged between 41 and 50, 5.4% were aged between 51 and 60, and 1.9% were older than 60. Respondent household income reporting spanned the range of categories and followed a generally bimodal distribution, with 45.73% of respondents reporting household income less than \$50,000, 34.81% of respondents reporting household income between \$50,000 and 99,999, and 19.45% of respondents reporting household income greater than \$100,000 (Fig. 2).

4.2. Outdoor recreation activity profiles

The types of activities that respondents pursue in the Sea-to-Sky Corridor were varied, and no single activity had participation from the majority of respondents

Table 1
Univariate tests of model variables

Category	Variable	<i>n</i>	Yes (%)	Mean	Standard deviation	95% Confidence interval
Representation ^a	Feeling represented	221	46.0	–	0.468	±0.061
Recreation participation ^b	# of activities	326	–	8.04	5.57	±0.50
	Annual participation	326	–	77.83	97.83	±10.57
	Trip expenses (\$)	300	–	52.03	208.10	±23.55
Enduring involvement ^a	Participation in planning	312	9.9	–	0.300	±0.033
	Club membership	326	31.3	–	0.464	±0.050
Location of recreation pursuit ^a	Provincial parks	323	77.1	–	0.421	±0.046
	Public land	323	41.2	–	0.493	±0.054
	Forest Service recreation site	323	23.8	–	0.427	±0.047
	Private land	323	16.7	–	0.374	±0.041
	Public waterway	322	7.5	–	0.263	±0.029

^a Dichotomous variables.

^b Continuous variables.

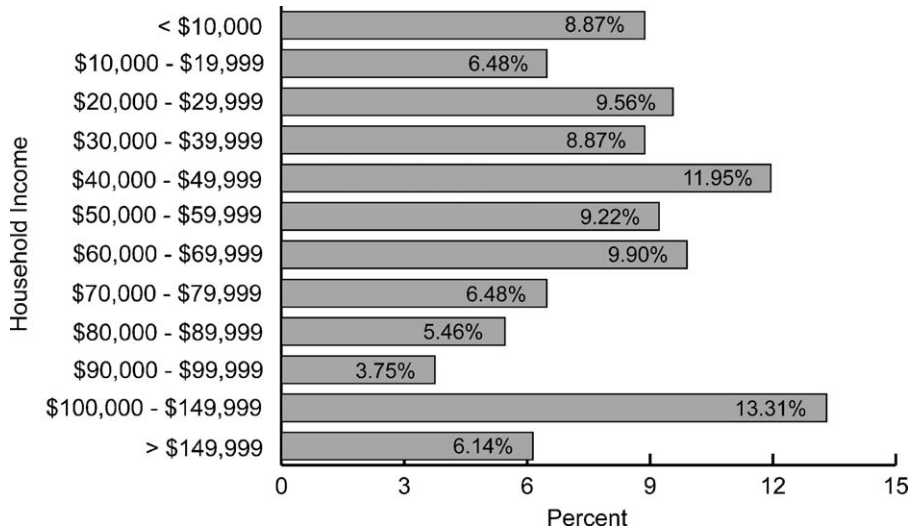


Fig. 2. Household income reporting (n = 324).

Table 2

Perception of representation of outdoor recreation participants for top 10 “important” recreation activities (n = 310)

Rank	Activity	n	Representation		
			Represented (%)	Standard deviation	95% Confidence interval
1	Trail hiking	51	66.7	0.476	±0.129
2	Rock climbing	41	73.2	0.449	±0.136
3	Backcountry skiing	23	60.9	0.449	±0.199
4	Downhill skiing	22	72.7	0.456	±0.186
5	Mountain biking	17	88.2	0.332	±0.153
6	Snowmobiling	15	60.0	0.507	±0.248
7	Groomed snowboarding	10	70.0	0.483	±0.284
8	Mountaineering	9	11.1	0.333	±0.205
9	Off-trail hiking	5	80.0	0.447	±0.351
10	Groomed X-country skiing	4	75.0	0.500	±0.424

(Table 2). Trail-hiking, rock climbing, and backcountry skiing had the largest number of participants identifying these activities as being of primary importance, while the remaining activities each had participation rates of less than 10%.

4.3. Respondent participation and representation in planning

A large majority of respondents (90.1%) indicated that they had not participated in a forest land-use planning exercise in the Sea-to-Sky Corridor; 26% of area residents had participated in a forest land-use planning exercise in the study area compared to only 5%

of non-residents. Outdoor recreation club membership was reported by 31.3% of respondents. Participation in a land-use planning exercise was only reported by 9.9% of respondents; 46% of respondents indicated that their outdoor recreation needs had been represented in forest land-use planning in the study area, and 22.8% indicated that their outdoor recreation needs had not been represented.¹ Although the representation question required a binary (yes/no) response, 44 respondents (13.5%) did not provide a yes/no answer, and

¹ This does not mean that their outdoor recreation needs had been met, only that these respondents perceived that their interests had been represented; this is distinct from needs attainment.

instead indicated that they did not know enough about land-use planning, or provided a comment explaining why they felt neither represented nor not represented; these responses were recorded as skipped, resulting in a total of 105 (32.2%) skipped responses to this question. Of the 221 completed binary responses to the question of representation, two-thirds indicated that their outdoor recreation needs had been represented in forest land-use planning. This pattern of response was similar for both residents and non-residents of the study area.

There was variation in the number of participants (grouped by the activity that they identified as being most important to them) that reported feeling that their outdoor recreation needs had been represented in forest land-use planning, and there did not appear to be any general relationship between feelings of representation and activity groupings. Most outdoor recreation activities, including fairly new or emerging recreation activities, such as snowboarding and mountain biking, had high levels of perceived representation; backcountry skiing and snowmobiling had moderate representation. However, mountaineering, an established activity, stood out as having a particularly low level of perceived representation. Mountain biking had the highest proportion of participants who felt represented (see Table 2).

In respondents' assessments of the ability of proxy representatives to represent outdoor recreation in forest land-use planning exercises, outdoor recreation clubs received the highest percentage (61.2%) of first choice rankings. Government and individual people (i.e. citizens) had similar modest percentages of first choice rankings (21.6 and 20.7% respectively), while industry received the lowest proportion of first choice rankings for their ability to represent respondent outdoor recreation needs (5.8%). Industry also had the highest percentage of fourth rankings. When first and second ranking cumulative percentages are considered in aggregate, outdoor recreation clubs still rank highest (82.4%) and individual people received higher cumulative rankings (61.3%) than government (45.2%) and industry (19.1%) proxies (Fig. 3).

4.4. Logistic regression model

Cases that had one or more missing values in the dependent and/or independent variables were not included in the regression analysis. Of the 326 cases in the sample, only 56.1% were complete for all independent and dependent variables and, therefore, included in the logistic regression analysis ($n = 183$).

With both backward conditional logistic regression models (one that included a constant and one that

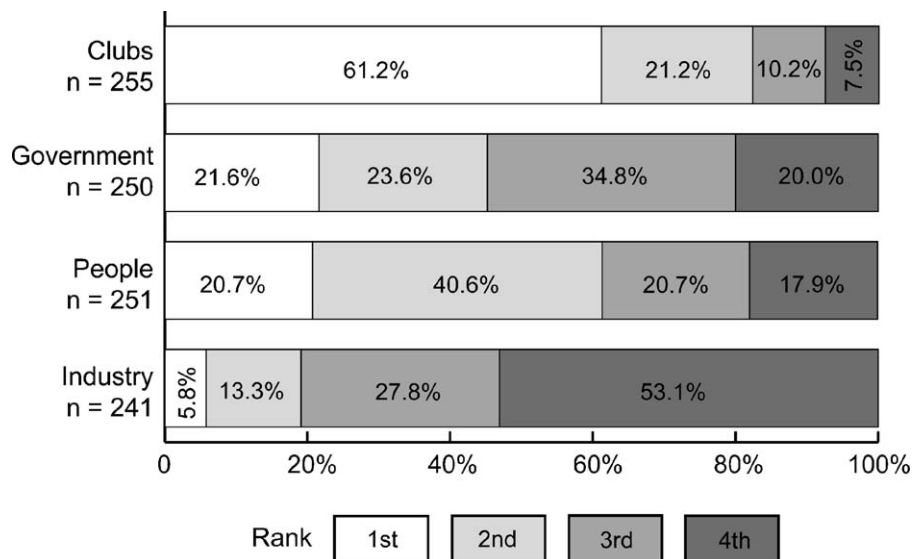


Fig. 3. Respondent rankings of representation proxies.

did not) the best fit was derived after 10 steps. The constant, when included in the model, was not significant ($p < 0.109$) and did not appear to contribute to the fit of the model. Analysis of model diagnostics (Table 3) indicated that, although the model with a constant had a marginally higher rate of correctly classified predictions (72.1% versus 68.9%), every other diagnostic suggested that the without-constant model was superior: higher R^2 values, fewer outlying residuals, a higher significance for the Hosmer and Lemeshow test, and a slightly higher $-2 \log$ likelihood chi-square statistic. Each of the without-constant model's coefficients were significant at $p < 0.1$.

Of the 14 variables considered in the logistic regression analysis, 5 variables were found to contribute to the model: household income; club membership; number of outdoor recreation activities engaged in during the past year; the number of outdoor recreation outings during the past year; and use of a public waterway. A complete summary of the logistic regression model including the coefficients for each variable, as well as their respective significance values and $\text{Exp}(\beta)$ (odds) is provided in Table 4.

The form of the final without-constant logistic regression model is:

$$\text{PROB (feeling represented)} = \frac{e^{(0.125)(X_1)+(-0.619)(X_2)+(0.073)(X_3)+(-0.003)(X_4)+(-1.408)(X_5)}}{1 + e^{(0.125)(X_1)+(-0.619)(X_2)+(0.073)(X_3)+(-0.003)(X_4)+(-1.408)(X_5)}} \quad (1)$$

The dependent variable represents the probability of any given respondent feeling that their recreation interests were represented in forest land-use planning exercises in the Sea-to-Sky Corridor. For prediction purposes, a score exceeding a probability of 0.5 (the classification cut-off) indicated that a particular individual feels that their interests were represented. Conversely, a probability score of below 0.5 indicated that the respondent likely did not feel represented.

Based on the analysis of odds, the five variables included in the model influence the perception of the

Table 3
Model summary statistics (enter at $p < 0.05$; removal at $p < 0.10$)

Diagnostic	Model run	
	Constant	No constant
Number of steps	10	10
$-2 \log$ likelihood	209.957	210.697
Cox and Snell R^2	0.104	0.209
Nagelkerke R^2	0.146	0.279
Number of studentized residuals > 2.000	3	2
Hosmer and Lemeshow test		
Chi-square	7.811	3.381
d.f.	8	8
Significance	0.452	0.908
Model prediction assessment		
No (%)	27.1	20.3
Yes (%)	93.5	91.9
Overall (%)	72.1	68.9
Significance	0.001	0.000

representation of outdoor recreation in forest land-use planning in the following ways:

1. For every increase of \$10,000 in household income, the odds of a person feeling represented increase by 13.3%.

2. If a person is a member of an outdoor recreation club, the odds of that person feeling represented decrease by 46.2%.
3. For every additional outdoor recreation activity that a person participates in, the odds of that person feeling represented increase by 7.5%.
4. For every additional outing that a person takes for outdoor recreation per year, the odds of that person feeling represented decrease marginally by 0.3%.

Table 4
Significant predictor variables of recreation perceived representation in forest land-use planning

Variable	β	S.E.	Wald	d.f.	Significance	$\text{Exp}(\beta)$
Household income (X_1)	0.125	0.039	10.135	1	0.001	1.133
Club membership (X_2)	-0.619	0.350	3.122	1	0.077	0.538
# of activities (X_3)	0.073	0.038	3.709	1	0.054	1.075
# of recreation outings (X_4)	-0.003	0.002	2.959	1	0.085	0.997
Public waterway use (X_5)	-1.408	0.577	5.948	1	0.015	0.245

Table 5
Jurisdiction of outdoor recreation pursuit and feeling of representation of outdoor recreation needs in forest land-use planning

Jurisdiction of outdoor recreation pursuit	<i>n</i>	Representation	
		No (%)	Yes (%)
Provincial park			
Does not apply	51	43.14	56.86
Applies	170	28.82	71.18
MoF recreation site			
Does not apply	169	34.32	65.68
Applies	52	25.00	75.00
Private land			
Does not apply	183	32.79	67.21
Applies	38	28.95	71.05
Crown land			
Does not apply	136	28.68	71.32
Applies	85	37.65	62.35
Public waterway			
Does not apply	204	29.90	70.10
Applies	16	56.25	43.75

5. If a person most often engages in recreation activities on a public waterway, the odds of that person feeling represented decrease by 75.5%.

As the waterway variable had such a large effect on the odds of a respondent's feeling of representation, responses to all of the jurisdictional variables (e.g. Crown land, provincial parks) were compared to respondents' reporting of representation, in order to explore any relationship that may be present between these variables. As in the logistic regression, only those respondents that indicated their feelings of representation are included in this analysis (Table 5).

Of all of the places where outdoor recreation could be pursued, those respondents engaging most often in outdoor recreation activities on public waterways indicated the lowest levels of perceived representation. A comparison of waterway users and non-users does reveal that waterway users reported lower perceived representation than non-waterway users (43.47% versus 92.73%); however, these results should be approached with some caution owing to the differences in group sizes (16 waterway users versus 204 non-waterway users).

5. Discussion

It is telling that 13.5% of respondents commented that they did not know enough about forest land-use planning to respond to the perceived representation question, or felt unsure how or if their outdoor recreation needs had been represented by planning in the Sea-to-Sky Corridor. Another 18.7% were also unable to answer. It might be expected that participation in planning and residence in the Sea-to-Sky Corridor would influence the perceptions of representation that outdoor recreationists hold. However, these variables were not identified as contributing to the logistic regression model. That participation in forest land-use planning processes had no discernable effect on respondent feelings of representation in decision-making may be a result of the overall low (<10%) proportion of respondents actually involved in planning processes.

Comparing the mean sample value for perception of representation in forest land-use planning (46.0%) with the reporting of representation by activity (Table 2) does not seem to present clear overall patterns of response. Most recreation activities seem to be associated with higher levels of perceived representation, although there does appear to be considerable variation between activities in levels of perceived representation.

Although mountaineers and waterway users generally reported low levels of perceived representation, caution is advised when interpreting these results due to the low numbers of these recreationists in the sample. Participants of activities that have traditionally occurred in the area (trail hiking, backcountry skiing, mountaineering, snowmobiling) generally reported somewhat lower levels of perceived representation than those engaged in newer or emergent activities. One notable exception to this observation is rock climbing, an activity that has been practiced in the area for upwards of 45 years (McLane, 1992). This sizeable outdoor recreation group reported a reasonably high perceived representation rate of 73.2%, which may be influenced by their active participation in the development of rock climbing strategies for three area parks and the management of the Stawamus Chief Provincial Park campground by a local climbing club. Mountain biking, a newer outdoor recreation activity in the area that made inroads into the area in the early

1980s with increased trail construction starting in 1996 (Dunn, 2001; Story, 2001), had perceived representation levels of 88.2%.

The finding that the level of representation of traditional activities is lower than the mean perceived representation of all respondents is counter-intuitive; one might expect newer forms of outdoor recreation activities to report lower levels of perceived representation as participants seek to develop the infrastructure necessary for their pursuits. However, newer forms of recreation require greater assistance and information to become established, therefore increased government contact likely occurs after an initial period of growth in activity; more entrenched activities likely require less attention due to the experience level of all concerned. Alternatively, newer forms of outdoor recreation may be creating conflicts with established activities, which led participants of established activities to feel increasingly disenfranchised. For example, despite mountaineers being some of the initial outdoor recreation advocates for the creation of Garibaldi Provincial Park in 1927 (British Columbia Ministry of Parks, South Coast Region, 1990), they reported the lowest representation of the activities examined here, 11.1%. Although mountaineers engaged in a higher mean number of recreation activities than the survey sample (10 activities versus 8 activities), which would suggest that they ought to enjoy higher odds of representation, mountaineers also reported higher mean annual recreation participation levels (101 outings versus 77 outings) which would serve to decrease their odds of feeling represented. This may indicate a shift in outdoor recreation management priorities in the area, as participants of an emergent activity, mountain biking, reported the highest level of representation, 88.2%; it is possible that mountaineers may feel displaced by other recreation activities. More respondents identified themselves with mountain biking than with mountaineering, reflecting participation trends to which land managers may respond by increasing opportunities for more popular activities.

It is somewhat surprising that off-trail hikers had a higher level of perceived representation than trail hikers (80.0% versus 66.7%) as the area has a large number of hiking trails, as well as a diverse range of opportunity settings. Cross-country skiers, who can use many of the same facilities and trails as hikers, report their perceived representation as 75%.

The logistic regression model indicated that the odds of a person feeling represented increase by 7.5% for each outdoor recreation activity that a person participated in. As the average number of activities for respondents was 8.04, this suggests that the contribution of recreation participation by activity increased the average respondent's odds of being represented by 60.3% relative to single activity recreationists. This supports the corollary to the Watson et al. (1991) finding that recreation specialists have a greater sensitivity to conflict: recreation generalists are less sensitive to conflict. The broader a respondent's recreation interests, the more likely it is that they felt that their interests had been represented in forest land-use planning, as some of the activities that they engage in are likely to be considered in planning. Engagement in a broader range of activities may provide increased opportunities to respondents to feel represented, as desirable recreation alternatives could exist for recreation opportunities that may not be locally available or planned for by forest land managers. However, this argument does not hold for a respondent's overall level of participation in recreation activities, as each outing that a person takes for outdoor recreation decreases the odds of that person feeling represented by 0.3%.

The average annual number of outings for respondents was 77.8, which suggests that the average respondent's odds of feeling represented decreased by 23.3% as a result of their participation level relative to single outing recreationists. This finding is supported by developmental theory, which suggests that increased levels of experience can lead to more complex understandings of recreation settings (Watson et al., 1991) and may influence perceptions of representation. The more actively engaged in outdoor recreation a person is, the greater the possibility that available local recreation opportunities could be exhausted. More actively engaged recreationists may also have an increased likelihood of encountering unsatisfactory experiences such as crowding, or becoming aware of recreation-related problems (Watson et al., 1991). Based on the analysis of odds, the number of activities that a person engages in, and their level of active participation in those activities, the average Sea-to-Sky Corridor respondent had a likelihood of feeling represented of 37.0%.

The model suggests that respondents who participated in outdoor recreation activities taking place on public waterways in the Sea-to-Sky Corridor (e.g.

fishing, sea kayaking, white water canoeing/kayaking) have a decreased likelihood of feeling that their recreation needs had been represented in forest land-use planning; although we advocate caution around this result, this does raise an interesting question about marine and aquatic recreation management (discussed below). Thus, the odds of the 7.5% of those respondents that participate in outdoor recreation activities that primarily utilized public waterways decreased by 75.5% relative to those respondents whose recreation pursuits generally did not make use of public waterways. The lack of general management of aquatic and marine recreation in the area is likely a contributing factor to the magnitude of the decrease in odds of these respondents feeling represented in forest land-use planning. The small number of waterway users precludes a broader generalization of this finding.

Household income was found to be the only demographic characteristic that played a role in respondent's likelihood of reporting representation in forest land-use planning: the odds of a person feeling represented increase by 13.3% for every \$10,000 increment in household income (of the one-quarter of respondents that reported household incomes \leq \$29,999, only 25% were students). This result suggests that socioeconomic barriers exist in land-use planning processes, a finding that echoes those of [Wondolleck et al. \(1996\)](#), [More and Stevens \(2000\)](#), and [Overdevest \(2000\)](#). However, respondents reporting a household income of \leq \$29,999 had participated in recreation activities 16 more times than respondents reporting household incomes of \geq \$30,000, but participated in one less recreation activity, on average. Age and area residency did not play a role in the regression model. It is interesting to note that three-quarters of respondents were out-of-area residents and that area residents were more likely to have participated in a land-use planning process, but both residents and non-residents of the Sea-to-Sky Corridor reported similar levels of perceived representation.

Although traditional representation vehicles, like outdoor recreation clubs, received high levels of support (61.2%) as the proxy best suited to representing their outdoor recreation interests, less than one-third of the respondents (31.3%) were members of a club. The odds of a person feeling represented by forest land-use planning decrease by 46.2% if they are club members. Possible explanations for this include: (1)

club members are more aware of outdoor recreation problems, issues, or land-use conflicts that affect their interests as a result of interactions with other club members; (2) people who are members of outdoor recreation clubs that have been involved in forest land-use planning processes might have an increased awareness of the procedural problems and issues that exist in these processes (e.g. perceived domination of the forestry agenda by government or timber interests); (3) club members may have higher expectations of representation or influence in forest land-use planning as a result of their club's advocacy efforts. [Robinson et al. \(2001\)](#), in a review of national studies of Canadian attitudes toward forest values and management, note that the public does not view government agencies tasked with managing forested landscapes as appropriate sources of management goals. This conclusion finds support in this study as government was identified, along with individual citizens, as a distant second in terms of proxies suited to representing outdoor recreation needs in forest land-use planning.

6. Conclusion

The widening array of outdoor recreation activities in high-use areas, such as the Sea-to-Sky Corridor in BC, poses new challenges to equitable participation of diverse recreation user groups in forest land-use planning. At the beginning of this paper, several questions were posed. With regard to the first, how well have past forest land-use planning exercises in BC represented the needs of the widening diversity of outdoor recreationists, it would appear that, on the whole, outdoor recreationists in the Sea-to-Sky Corridor do feel that their recreation needs have been represented. The main exception to this is mountaineers, a group that has historically been active in park development and recreation advocacy through the Alpine Club of Canada. As a group, mountaineers reported the lowest levels of perceived representation of all activities (and were also a small group within this sample).

The second question, how well represented do participants of newer outdoor recreation activities feel, may be complicated by low numbers of people that are engaged in some of the newer activities. Three activities may be considered new or emergent in the Sea-to-Sky Corridor: mountain biking, trail running, and

ice climbing. However, with the exception of mountain biking, the number of people reporting engagement in these activities is low, making it difficult to draw any conclusions about their respective levels of perceived representation. A large majority of mountain bikers though did consider themselves represented in forest land-use planning, suggesting that indeed, popular new forms of recreation are being given serious consideration in resource decision-making; although there is some suggestion that traditional recreationists are feeling “squeezed out” of the planning process.

Outdoor recreation clubs appear to be the most popular form of representation in forest land-use planning processes, although their perceived effectiveness in representing recreationist interests in planning processes appears rather low to club members.

Clearly, these complex relationships merit further study. Ongoing research at the Collaborative for Landscape Planning at the University of British Columbia is investigating an expanded data-set for the Sea-to-Sky and other areas, including analysis of actual representation of recreationists in key planning processes and triangulation with the initial statistical results presented here.

The full range of values and benefits derived from outdoor recreation has been historically difficult to measure (and sometimes understand). A consequence of this may be that recreation has had a lower political profile, and may have been underrepresented in traditional forest management of publicly owned Crown land in BC. From a pragmatic perspective, as publicly owned forestlands (both parks and Crown land) make up 95% of BC's landscape, there ought to be meaningful and equitable public input and influence in forest land-use management decisions, and a wide array of outdoor recreation stakeholders should be included in those decisions that affect them.

The results of this study support five forest land-use planning strategies that may assist planners in increasing actual and perceived representation of forest recreationists. First, government agencies involved with forest land-use planning should make an effort to include representatives from the range of demographic backgrounds, particularly those with lower household incomes (e.g. [Wondolleck et al., 1996](#); [Overdevest, 2000](#)). Secondly, government land-use planners could work more closely with outdoor recreation clubs in the

development and assessment of management strategies and objectives; in a similar vein, outdoor recreation clubs could be more effective in advocating for the needs of their activities and members in participatory forest land-use planning processes. Third, participatory planning processes should attempt to include as many outdoor recreation activity representatives as possible, as no single activity or club represents all recreation participants. Fourth, outdoor recreationists that report high levels of annual participation could be identified through systematic visitor surveys and invited to act as advocates or user-group representatives by forest land-use planners and managers, in order to help to identify conflicts or other issues with the potential to have an impact on the recreation experience; the integration of new or emergent outdoor recreation activities with traditional ones would appear to be a key issue. Finally, this study suggests a need for better coordination of the management of marine and aquatic outdoor recreation activities, as the current situation in British Columbia is not seen as addressing the outdoor recreation needs of water-based activity participants.

While robust statistical models, like the one employed in this study, can be useful tools to help inform stakeholder analysis and planning processes, it should be noted that one might expect different results in different areas with other configurations of outdoor recreation activities, or in areas with fewer new or emerging outdoor recreation activities than in the Sea-to-Sky Corridor. Similar approaches to querying the perceived representation of the general population's recreation needs could shed light on the reasons that some recreationists have chosen not to pursue their outdoor recreation interests in particular areas.

Acknowledgements

The authors would like to acknowledge the contributions of Don Luymes of UBC, Rick Rollins of Malaspina University College, Tom Pawlowski, and Chris Platz of BC Parks, and Norma Wilson and the Outdoor Recreation Council of BC. Valuable suggestions were made by the anonymous reviewers of earlier drafts. The Collaborative for Advanced Landscape Planning (CALP), University of British Columbia, provided logistical and monetary support for this research.

References

- BC Tourism, 1998. British Columbia visitor study: report on travel in British Columbia. The Report on Visitors to Vancouver Coast & Mountains Tourism Region. Tourism BC, Victoria.
- British Columbia Ministry of Parks, South Coast Region, 1990. Master Plan for Garibaldi Provincial Park. Government of British Columbia, Victoria.
- British Columbia Ministry of Sustainable Resource Management, no date. Sea-to-Sky Land and Resource Management Plan. Retrieved July 27, 2005, from http://srmwww.gov.bc.ca/cr/resource_mgmt/lrmp/s2s/.
- British Columbia Ministry of Water, Land and Air Protection, no date. 1999 Provincial Park attendance in parties. Retrieved March 23, 2003, from <http://wlapwww.gov.bc.ca/bcparks/facts/stats/1999pdh.pdf>.
- BC Parks Garibaldi/Sunshine Coast District, and Volunteer Group of Climbers, no date. Stawamus Chief, Shannon Falls and Murrin Provincial Parks Rock Climbing Strategy. British Columbia Ministry of Environment, Lands, and Parks, Brakendale, BC.
- Canadian Council of Forest Ministers, 2003. CCFM C&I Review: Technical Working Group Recommendations for Improved CCFM Indicators for Sustainable Forest Management. Canadian Council of Forest Ministers C&I Secretariat, Ottawa, Canada.
- Canadian Standards Association, 2003. Sustainable Forest Management: Requirements and Guidance (CAN/CSA-Z809-02), Mississauga, Ont.
- City of Vancouver, 2003. Official Results of Olympic Vote. Retrieved March 23, 2003, from <http://www.city.vancouver.bc.ca/ctyclerk/NewsReleases2003/NROlympicvoterresultsofficial.htm>.
- Clover Point Cartographics, Geoscape Environmental Planners and Lions Gate Consulting, Inc., 2000. Forest Tourism Opportunities for Squamish Forest District and In-Shuck-Ch/N'Quat'Qua Statement of Intent Area: Project Report.
- Dillman, D.A., 2000. Mail and Internet Surveys: The Tailored Design Method, second ed. John Wiley & Sons, Inc., New York.
- Dillman, D.A., Eltinge, J.L., Groves, R.M., Little, R.J.A., 2002. Survey nonresponse in design, data collection, and analysis. In: Groves, R.M., Dillman, D.A., Eltinge, J.L., Little, R.J.A. (Eds.), Survey Nonresponse. John Wiley & Sons, Inc., New York, pp. 3–26.
- Doug Leavers Consulting, 2000. Strategic planning for commercial recreation: Squamish District including the Sea-to-Sky Corridor. Phase II. CR Management Plan. BC Assets & Land Corporation Lower Mainland Region.
- Duffy, D., Hallgren, L., Parker, Z., Penrose, R., Roseland, M., 1998. Improving the shared decision-making model: an evaluation of public participation in land and resource management planning (LRMP) in British Columbia, vol. 1. Summary Report. Project conducted in the SFU Department of Geography and School of Resource and Environmental Management for Forest Renewal of British Columbia, Vancouver (Funded by Forest Renewal of BC).
- Dunn, S., 2001. Mountain Biking British Columbia, second ed. Rip It Up Publishing, North Vancouver, BC.
- Forest Stewardship Council Canada Working Group, 2004. National Boreal Standard. Forest Stewardship Council (FSC) Canada Working Group, Toronto, Ont.
- Gobster, P.H., Barro, S.C., 2000. Negotiating nature: making restoration happen in an urban park context. In: Gobster, P.H., Hull, R.B. (Eds.), Restoring Nature. Island Press, Washington, DC, pp. 185–207.
- Gregoire, T.G., Buhyoff, G.J., 1999. Sampling and estimating recreational use (General Technical Report PNW-GTR-456). U.S. Department of Agriculture, Forest Service, Pacific Northwest research Station, Portland, OR.
- Haddock, M., 1999. Guide to Forest Land Use Planning. West Coast Environmental Law Research Foundation, Vancouver.
- Helford, R.M., 2000. Constructing nature as constructing science: expertise, activist science, and public conflict in the Chicago wilderness. In: Gobster, P.H., Hull, R.B. (Eds.), Restoring Nature. Island Press, Washington, DC, pp. 119–142.
- Holman, G., Nicol, S., Simpson, K., Slaney, T., 2001. Sea-to-Sky Land and Resource Management Plan (LRMP): Socioeconomic and Environmental Base Case. British Columbia Ministry of Sustainable Resource Management, Victoria.
- Hosmer, D.W., Lemeshow, S., 2000. Applied Logistic Regression, second ed. John Wiley & Sons, Inc., Toronto.
- InterVISTAS Consulting, Inc., 2002. The Economic Impact of the 2010 Winter Olympic and Paralympic Games: an Update. Ministry of State for Community Charter and 2010 Olympic Bid, Victoria.
- Macaree, M., Macaree, D., 1994. 103 Hikes in Southwestern British Columbia, forth ed. Douglas & McIntyre, Vancouver.
- Macaree, M., Macaree, D., 1997. 109 Walks in British Columbia's Lower Mainland, forth ed. Douglas & McIntyre, Vancouver.
- McAllister, M.L., 1998. Shared decision-making: lessons from CORE. *Environments* 25 (2/3), 126–132.
- McLane, K., 1992. The Rockclimbers' Guide to Squamish. Merlin Productions, Inc., Squamish, BC.
- Manning, R.E., 1999. Studies in Outdoor Recreation: Search and Research for Satisfaction, second ed. Oregon State University Press, Corvallis, OR.
- More, T., Stevens, T., 2000. Do user fees exclude low-income people from resource-based recreation? *J. Leisure Res.* 32 (3), 341–357.
- Mussio, R., Mussio, W., 1999. Backroad Mapbook, vol. 1. Southwestern BC, third ed. Mussio Ventures, Ltd., New Westminster, BC.
- Outdoor Recreation Council of British Columbia, 2000. Public Recreation Study of the Squamish Forest District. The British Columbia Ministry of Forests and the Land Use Coordination Office, Victoria.
- Overdeest, C., 2000. Participatory democracy, representative democracy, and the nature of diffuse and concentrated interests: a case study of public involvement on a national forest district. *Soc. Nat. Resour.* 13 (7), 685–696.
- Payne, R.J., Graham, R., 1993. Visitor planning and management in parks and protected areas. In: Dearden, P., Rollins, R. (Eds.), Parks and Protected Areas in Canada: Planning and Management. Oxford University Press, Toronto, pp. 185–210.

- Robinson, D.W., Robson, M., Rollins, R., 2001. Towards increased citizen influence in Canadian forest management. *Environments* 29 (2), 21–41.
- Roseland, M., Day, J.C., Penrose, R.W., 1998. Shared decision-making in public land planning: an evaluation of the Cariboo-Chilcotin CORE process. *Environments* 25 (2–3), 27–47.
- Rothman, H.K., 2004. *The New Urban Park: Golden Gate National Recreation Area and Civic Environmentalism*. University Press of Kansas, Lawrence, KS.
- Salant, P., Dillman, D.A., 1994. *How to Conduct Your Own Survey*. John Wiley & Sons, Inc., New York.
- Sheppard, S.R.J., 2003. Knowing a socially sustainable forest when you see one: implications for results-based forestry. *For. Chronicle* 79 (5), 865–875.
- Story, R., 2001. *Mountain Biking*. W.W. Norton & Company, Ltd., New York.
- Tabachnick, B.G., Fidell, L.S., 2001. *Using Multivariate Statistics*, fourth ed. Allyn and Bacon, Toronto.
- Watson, A.E., Roggenbuck, J.W., Williams, D.R., 1991. The influence of past experience on wilderness choice. *J. Leisure Res.* 23 (1), 21–36.
- Wilson, J., 1998. *Talk and Log: Wilderness Politics in British Columbia, 1965–1996*. UBC Press, Vancouver.
- Wondolleck, J.M., Manring, N.J., Crowfoot, J.E., 1996. Teetering at the top of the ladder: the experience of citizen group participants in alternative dispute resolution processes. *Sociol. Perspect.* 39 (2), 249–262.
- Zar, J.H., 1984. *Biostatistical Analysis*, third ed. Prentice-Hall, Inc., Upper Saddle, NJ.
- Howard Harshaw** is a post-doctoral fellow in forest resources management, University of British Columbia, where he conducts research on outdoor recreation management and the contributions of social networks to social sustainability.
- Rob Kozak** is an associate professor of sustainable business management, University of British Columbia, where he teaches and conducts research on sustainable business management practices and issues, and providing business solutions to complex problems related to sustainable development, forestry, wood products, and the emerging conservation economy.
- Stephen Sheppard** is an associate professor of forest resources management and landscape architecture, University of British Columbia, where he teaches and conducts research on aesthetics, landscape visualization, and climate change. He directs the Collaborative for Advanced Landscape Planning, an interdisciplinary research group using perception-testing and immersive/interactive visualization to support public communications and collaborative planning on sustainability issues.