

Do Visitor Experiences Differ Across Recreation Settings? Utilizing Geographical  
Information Systems to Study the Setting-Experience Relationship

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### **Abstract**

Managers of outdoor recreation areas must understand how certain types of settings influence visitor experiences to support preferred on-site experiences. Geographically explicit techniques need to be utilized to explore this setting-experience relationship because inaccurate measuring methods have resulted in a weak association between settings and realized visitor experiences. This study piloted accurate GIS methods to study how visitor experiences differ across settings in Oulanka National Park, Finland. Data on visitor experiences was collected in a map-based online survey. Visitors ( $N = 170$ ) completed the survey after their visit to Oulanka NP by marking first the locations which they had visited on an electronic map and then selecting those experience items, such as relaxation and physical wellbeing, that they had felt in these locations. The study area was classified into four different settings on a continuum of primitive to developed, using measures of infrastructure, social interaction, and accessibility in GIS software. Mapped experiences were compared against the settings using chi-squared test. No significant differences were found in experience items across recreation settings. The results encourage continued use of GIS tools to study visitor experiences and their geographical contexts, but suggest using more qualitative forms of mapping.

*Keywords:* visitor experience, setting, recreation, PPGIS, ROS, Oulanka National Park

### **Do Visitor Experiences Differ Across Recreation Settings? Utilizing Geographical Information Systems to Study the Setting-Experience Relationship**

Managers of outdoor recreation areas need to decide which on-site visitor experiences they want to support and then carry out management procedures that facilitate these predefined and preferred experiences (Driver, 2008). Even though these certain types of experiences cannot be controlled nor guaranteed, visitor experiences can be shaped and enhanced by those who design the physical context; “activities, events, and environments can be intentionally designed to increase the likelihood that particular types of experiences will emerge” (Packer & Ballantyne, 2016, p. 133). Therefore, it is important to understand how visited recreation settings influence visitor experiences.

Exploring the relationship between recreation setting and visitor experience has been the center of outdoor recreation research for 40 years (Williams, 2007). Studies comparing visited settings (excluding the ones focusing on hypothetical setting preferences) and experiences have commonly found no or only small differences in experiences across setting types (Backlund & Stewart, 2012; Fix, Carroll, & Harrington, 2013; Kil, Stein, & Holland, 2014; Pierskalla, Lee, Stein, Anderson, & Nickerson, 2004). However, a concern has emerged that these results are more a consequence of the applied methods than an accurate reflection of a lack of differences (Backlund & Stewart, 2012; Fix, Carroll, & Harrington, 2013). A particular concern, raised in this study, is the limitation of traditional survey methods to measure visitor experiences so that the setting in which the experience takes place can be defined accurately. When experiences were explicitly measured geographically, visitor experiences differed across recreation settings: physical activity was a more common experience in developed settings, and the experience of solitude was more frequent in remote and wilderness settings (Brown & Weber, 2011).

This study employs geographically accurate Geographic Information Systems (GIS) techniques to study the setting-experience relationship to improve setting-experience research. The demonstrated methods serve useful techniques to measure place-based visitor experiences and to define recreation settings for recreation area managers. Empirical data collected from Oulanka National Park, Finland, are presented to illustrate these methods.

### **Mapping Visitor Experiences**

Based on motivation theory, recreation experience is a package of psychological outcomes that participants desire from engaging in recreation (Driver & Brown, 1975). To measure the dimensions or items of a visitor experience, a Recreation Experience Preference (REP) scale has been developed (Driver, 1983). The scale has helped to find how motivation items—such as self-achievement, meeting new people, or learning—either adds to or detracts from a visitor's level of satisfaction with his or her visit to a particular area. Even though the scale was initially developed to measure motives for engaging in recreation behavior, the scale has become a post-activity assessment tool for measuring the actual outcomes of recreation, assuming that the participants' motives for engaging in recreation behavior have been fulfilled (Backlund & Stewart, 2012). This kind of approach is often referred to as a *goal-directed* mode to outdoor recreation (Williams, 2007).

Studies measuring visitor experiences as motives or as the outcomes of visits have rarely been explicit about where the experience took place. Experiences have been attached, for instance, to areas where visitors have spent most of their time during the visit (e.g., Pierskalla et al., 2004), or to the area in which they spent most of their nights (e.g., Backlund & Stewart, 2012). These kinds of assumptions are adequate when surveying the overall motives or outcomes of visiting a certain area, but the approach over-generalizes when exploring the relationship between settings and experiences. This is because the physical environment of a recreation area is rarely, if ever, homogeneous. Therefore, it is important to

be explicit about where each experience occurs when the interest is in how the type of setting affects the visitor experience.

Public Participation Geographic Information Systems (PPGIS) have been increasingly used to measure how people experience particular locations (for a review, see Brown & Kyttä, 2014). PPGIS studies present spatially explicit ways to measure experiences as the participants in these studies are asked to mark on a paper or web-based map where they had certain kinds of experiences. In the context of outdoor recreation, PPGIS studies have explored visitors' motivations for mountain biking in certain places (Wolf, Wohlfart, Brown, & Bartolome, 2015); visitors' perceptions of their most positive and most negative experiences (Pietilä & Kangas, 2015); residents' perceptions of areas that have particular positive qualities, such as beautiful scenery or peace, and areas with negative features (Tyrväinen, Mäkinen, & Schipperijn, 2007); visitors' health benefits (Brown, Schebella, & Weber, 2014); and visitors' experiences related to aesthetics, solitude, social interaction, trail-based activity, learning, and wildlife (Brown & Weber, 2011). However, these studies have explored visitor experiences based primarily on the ad hoc needs of a certain study area, and have not used acknowledged conceptualisations of visitor experience, such as the Recreation Experience Preference scale.

PPGIS studies provide, however, technically applicable solutions for studying the relationship between settings and experiences. The main advantage of PPGIS methods are their ability to relate experiential information to a certain location. The main challenge of the method is related to sampling: Data must represent the most appropriate population segments and there must be a sufficient amount of data to identify spatial patterns with confidence. In addition, the spatial markers used in mapping exercises must capture the true nature of the experience and must be placed exactly on the map (Brown & Kyttä, 2014).

### **Defining Recreation Settings**

Various metaphors can be employed to describe a setting for recreation. According to the goal-directed mode, settings are evaluated based on their goal-fulfilling potential and, therefore, settings for experiences reflect tangible properties of the environment (Williams, 2007). Likewise, a setting can be considered as a combination of attributes of a real place that gives it recreational value (Clark & Stankey, 1979). Studies on the relationship between experiences and settings have used “amenity assessments” to define the type of setting in which the experiences occurred. The most well-known and used framework to categorize different kinds of settings for recreation is the Recreation Opportunity Spectrum (ROS), which distinguishes settings in a range from primitive (i.e., remote, large, and undeveloped settings) to developed or modern (i.e., easily accessible and developed infrastructure) (Brown, Brown, Driver, & McConnell, 1978; Clark & Stankey, 1979).

Previous studies utilizing the ROS have varied greatly depending on the size of each kind of setting. Areas have ranged from park units that represent different ends of the spectrum (e.g., Weber & Anderson, 2010) to smaller zones within one park or area (e.g., Backlund & Stewart, 2012; Fix, Carroll, & Harrington, 2013) or combinations of different scales (e.g., Brown & Weber, 2011). All in all, previous studies have represented rather large geographical areas as a homogeneous setting type. This is problematic as extensive geographical areas rarely represent a homogenous setting. Therefore, using a more precise way of spatially classifying recreation areas is necessary when researching the relationship between visitor experiences and recreation settings.

GIS technology enables systematic classification of a recreation area. A few previous studies have demonstrated how GIS software can be utilized to create recreation opportunity classification or comparable management zones (e.g., Joyce & Sutton, 2009; Kil, Stein, & Holland, 2014; Orsi, Geneletti, & Borsdorf, 2013). These studies exemplify how information from geographical databases can be used to create layers describing the physical, social, or

managerial features of the area. For example, if remoteness is defined as an increasing distance from roads and other motorized access, the tools within a GIS can easily define the distance from a particular feature of interest and produce a remoteness layer. Finally, by combining the selected layers, the area can be easily classified into certain setting types. This kind of automatic generation has a great benefit over a manual method because of the removal of individual interpretations, and it is readily repeatable as new data are acquired (Joyce & Sutton, 2009).

### **Research Objectives**

The research questions of this study are: (a) What kind of experiences do visitors have in Oulanka National Park? (b) In which types of settings do these experiences take place? and (c) How do these experiences differ across the different types of recreation settings? To be explicit about the location where experiences take place, a PPGIS method was chosen for measuring visitor experiences. PPGIS studies have previously measured visitor experiences based primarily on the ad hoc needs of certain study areas, but a more systematic foundation for measuring experiences was used in this study. The REP scale was applied when operationalizing the dimensions of visitor experiences in Oulanka National Park. This made it possible to compare the results of this study with results from previous studies on the relationship between recreation settings and visitor experiences. In addition, to be precise about the type of setting where the mapped experiences take place, a GIS technique was utilized for classifying the study area into recreation settings. The spectrum from primitive to developed, familiar from ROS, was applied to be consistent with previous studies. However, as previous studies have used rather extensive areas to represent a certain setting type, this study uses a small-scale GIS technique to classify the geographical area of Oulanka National Park into setting types. This is done to improve the geographical preciseness of the data.

## Method

### Study Site and Participants

The study site was Oulanka National Park and Valtavaara-Pyhävaara Nature Reserve, both managed by Parks and Wildlife Finland, a unit of the state-owned enterprise Metsähallitus. The area is referred to as Oulanka NP throughout this study. The study area is located in northeastern Finland, next to the Russian border and near the Arctic Circle (Figure 1). Oulanka NP is closely associated with extensive wilderness, landscapes ranging from pine forests to valleys of large rivers with sandy banks and rocky rapids, to extensive aapa mires in the north. The region hosts a wide range of biotopes and species (Alatossava, 2011).

Having a long history of outdoor recreation, Oulanka NP is currently the fourth most visited national park in Finland with approximately 200,000 annual visits (Metsähallitus, 2016). The park offers opportunities for activities including hiking, canoeing, skiing, snowshoeing, fishing, and wildlife viewing. Motorized activities are prohibited in the park area. The recreation infrastructure of the park includes visitor centers, campfire sites, camping grounds, wilderness huts, and parking places. The park entrance is free of charge for all visitors.

The park is especially famous for the Karhunkierros (Bear's Trail), an 80-kilometer hiking trail starting at the northernmost point of the park, Hautajärvi, and ending at the Ruka tourist resort. Additionally, the park has five day-trip trails ranging from five to twelve kilometers. The most visited sites of the park, with well-developed infrastructure, are Kiutaköngäs and Pieni Karhunkierros in Juuma. Visitors to the park often perceive these locations as the highlights of their visit as they are characterized by unique rapids and cliffs and host some of the most famous sights in the park (Pietilä & Kangas, 2015).

*<Insert Figure 1 here>*



Most of the study participants ( $N = 170$ ) were Finnish, with previous experiences of visiting Oulanka NP (Table 1). Around half of the respondents were female, had higher education, and were over 45 years old. Approximately 40% of the respondents were overnight visitors. The profile of respondents corresponds well with participants ( $N = 756$ ) in the Oulanka NP visitor survey 2014 (Puska, 2015). Respondent profiles in these two samples differed significantly only by the length of visit, with overnight visitors being over-represented among the study respondents ( $\chi^2 = 4.9$ ,  $df = 1$ ,  $p \leq .05$ ). However, the experiences that visitors gained in Oulanka NP did not differ between day visitors and overnight visitors ( $\chi^2 = 4.1$ ,  $df = 7$ ,  $p > .05$ ).<sup>1</sup>

*<Insert Table 1 here>*

### **Data Collection About Visitor Experiences**

The data for this study were collected using a web-based PPGIS survey attached to Parks and Wildlife Finland's standard visitor survey. The on-site visitor survey was conducted between February and October in 2014. This survey was carried out according to a developed and nationally-applied process of collecting representative data on visitors to state-owned lands (Erkkonen & Sievänen, 2001). Nine sites, which represented the park spatially and where visitors were easily encountered, were selected for data collection. In these sites, a researcher approached visitors to ask them to participate in the survey. Researchers always asked the first member of an encountered party to participate in the survey to reach a representative sample of the visitors. A total of 736 visitors filled in the self-administrated questionnaire, which was four pages in length and included mostly closed-ended questions. The questionnaire was available in Finnish, English, German, and Russian.

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<sup>1</sup> Chi-square statistics and analysis of standardized residuals were completed to indicate if the frequency of mapped experiences differed between day and overnight visitors.

In the visitor survey, participants were asked to provide their e-mail address at the end to take part in a complementary web-based PPGIS survey. Altogether, 257 visitors gave their email address. These volunteers were sent an e-mail invitation within two weeks of their visit to Oulanka NP. The invitation included instructions on how to fill in the PPGIS survey and an individual access code linking the respondent with the survey. Two reminders were sent to visitors who had not entered the PPGIS interface within two weeks of receiving the invitation. Finally, 170 visitors responded to the PPGIS survey, resulting in a response rate of 66%.

When entering the PPGIS survey, participants were asked to drag-and-drop spatial markers on an electronic map representing the study area. While conducting the mapping exercise, participants could zoom in and out among different map scales. The smallest scale map (1:200,000) showed the entire study area including the borders of the conservation areas and the names of most visited sites. Dropping markers was restricted to scale 1:25,000 or larger to control the precision of the spatial data (see Brown & Kyttä, 2014, p. 131). All the layers of the map included the basic features of the physical environment such as roads, lakes, rivers, and contour lines. The maps from the scale 1:25,000 also included the symbols of recreation infrastructure such as trails, parking places, huts, and camp sites. The survey was divided into five distinct mapping tasks, in which visitors were asked to map (1) the trails they had used, (2) the sites they had visited, (3) the issues that had disturbed their visit, (4) the features of the park that they found especially interesting or attractive, and (5) their satisfaction with the infrastructure of the park.

This study utilized the data that asked participants to map the sites they visited. In this, respondents were asked to drag-and-drop a point marker labelled “I visited this place” on the map. After dropping the marker, a pop-up window opened and asked participants to choose, from a predefined list, one or more positive experiences that they had had in that particular location (Figure 2). Experience items were applied from the REP scale, but for technical

reasons the selection of items was limited to physical wellbeing, relaxation, learning about nature, nostalgia, excitement, social bonding, independence, and escaping daily routine. These experience items were selected together with the representatives of the Parks and Wildlife Finland and were operationalized for visitors as shown in Figure 2. Visitors were only asked to indicate whether or not they had a particular experience in the specific location instead of rating the importance of each experience item. This was again due to technical limitations of the PPGIS survey interface. In addition to predefined experiences, an open-ended space was offered to describe an experience outside the list.

*<Insert Figure 2 here>*

### **Determining Setting Classification**

To be able to compare the mapped experience items against different types of recreation settings, the study area was classified into settings according to three criteria: on-site management, accessibility, and social interaction. These are commonly-used condition criteria in ROS (Clark & Stankey 1979). The process was run in ArcGIS software based on scoring 250\*250 meter pixels representing the study area. The small pixel size was chosen to utilize the spatial accuracy of mapped experience items. The process is illustrated in Figure 3.

*<Insert Figure 3 here>*

Details about the classification process of the three criteria are as follow. Firstly, the proximity to main infrastructure (visitor centers, huts, and camping areas) was used as a measure of on-site management. Pixels that were located within 250 meters from the main infrastructure were given one point to represent the human modification of the site. Secondly, proximity to parking areas was used as a measure of accessibility, giving one point to all pixels that intersected with a 250 meter buffer zone of parking areas and were consequently considered easily accessible settings. Thirdly, the annual number of visits to trails was used as a measure of social interaction. In this case, the trail sections with a 250 meter buffer zone

were classified according to the recorded annual number of visits. Trail sections with more than 30,000 annual visits were considered highly-visited trails, receiving two points; trails with 7,000 to 30,000 annual visits were considered moderately-visited trails, receiving one point; and trails with fewer than 7,000 annual visits were perceived as low-visited, receiving zero points.

Finally, a sum variable considering the scores for all selected criteria was calculated for each pixel. This pixel sum value was then used to classify pixels into final setting types. A high pixel value corresponded with the development, good accessibility, and frequent social interaction of the setting, and a low score with the primitiveness of the setting. Pixels that yielded three or four points were considered developed settings. Pixels with a value of two were classified as semi-developed, pixels with a value one as semi-primitive, and the remaining pixels with zero points as primitive settings. The settings are described in more detailed in Table 2.

*<Insert Table 2 here>*

### **Analyses**

To answer the first research question—What kind of experiences do visitors get from Oulanka National Park?— the relative frequency of each type of experience was explored. To explore the second research question, related to the type of setting in which experiences take place, a map representing the overall spatial distribution of experiences was generated in ArcGIS software. This was done by counting the number of mapped experiences for each 250\*250 meters pixel representing the study area. In addition, each mapped experience was joined with a geographically corresponding setting description using the spatial join function in ArcMap. This made it possible to sum up how many experiences intersected with each setting type.

To answer the third, and main, research question—How do visitor experiences differ across settings?—a chi-square statistic and an analysis of standardized residuals were completed to indicate whether any experience items were disproportionately represented within a given setting, which would affect the overall spatial association of setting types and experience items. Standardized residuals greater than 1.96 (Brown & Weber, 2011) were considered indicating that participants had mapped significantly more or fewer of certain experience items (e.g., relaxation) in a particular setting (e.g., developed) than would be expected, contributing thus to the overall relationship between experiences and settings.

### **Results**

To answer the first research question, the number of different kinds of experiences was explored. Participants mapped a total of 1,162 experience items within the study area. Visitors most commonly reported experiencing relaxation while visiting Oulanka NP. These items covered 19% of all mapped experience items. This experience was followed by physical wellbeing (18%) and social bonding (16%). Visitors reported more rarely learning about nature (10%), escaping from everyday life (10%), independence (8%), excitement (8%), and nostalgia (7%). In addition to predefined items, a minority (4%) of markings represented “other” experiences, which were most commonly described as enjoying beautiful scenery, tasting water from the river, or feeling physically exhausted.

To answer the second research question, the locations of mapped experiences was studied. Approximately one third (30%) of the experiences were mapped as occurring in Kiutaköngäs and one third (30%) in the Juuma area, which are the most visited places within the park with the most developed recreation infrastructure (Figure 4). Less significant experiential hotspots were located in Ruka-Valtavaara (14%) and in Oulanka Canyon (6%). The amount of experiences in each setting type was well-balanced: 215 experience items were placed in the most primitive settings, which do not have any recreation infrastructure,

are hard to access, and have a low possibility to meet other people; 286 experiences were placed in semi-primitive settings, which are further away from recreation infrastructure and hard to reach; the greatest amount of experiences (364) were located in semi-developed settings, which are located close to recreation infrastructure and access points; and 243 experiences were mapped in the park's most developed settings, including developed recreation infrastructure and easy access from the park's parking places.

*<Insert Figure 4 here>*

Finally, the main research question on the relationship between settings and experiences was explored. The distribution of experience items was similar across different setting types; there was no significant difference between the frequency of experience items and setting types ( $\chi^2 = 14.531$ ,  $df = 21$ ,  $p = 0.846$ ). The grey area in Figure 5 indicates how relatively frequently each experience item was mapped within a certain setting. The figure shows that, even though not statistically significantly, the tendency for visitors to experience independence and relaxation was relatively more common within primitive settings than in developed settings. On the other hand, learning about nature and nostalgia tended to be more common experiences within developed settings, whereas the experience of social bonding tended to be relatively more common within semi-primitive settings. The frequency of physical well-being or excitement did not increase or decrease systematically along the spectrum of settings.

*<Insert Figure 5 here>*

### **Discussion**

The aim of this study was to pilot new geographically-explicit methods to study how visitor experiences are connected with certain setting types. The study showed that visitors reported that physical well-being and relaxation were the most common experiences during their visits to Oulanka NP. Experiences were located in all four types of settings, ranging

from primitive to developed; each setting type captured approximately an equal number of experiences. No significant relationship was found between visitor experiences and setting types. These results suggest that different types of recreation settings, defined according to their level of management, access, and social interaction, do not necessarily cause differences in visitors' experiences, confirming the results of previous studies (e.g., Backlund & Stewart, 2012; Fix, Carrol, & Harrington, 2013; Kil, Stein, & Holland, 2014; Pierskalla et al., 2004).

Some minor differences in visitor experiences were, however, evident across settings. Visitors tended to experience independence more frequently in primitive settings, weakly supporting the premises of the ROS. This has also been noted by Brown and Weber (2011), who found that visitors placed more experiences of solitude in the remote and wilderness settings than in developed settings. The study also showed that visitors experienced learning about nature more commonly in the developed settings, proposing that nature interpretation, such as the information panels of local flora and fauna commonly placed in developed settings, support visitor learning outcomes (Tubb, 2010). However, research shows that visitors also attain learning more commonly in the less developed sections of parks (Weber & Anderson, 2010). In addition, nostalgic experiences accumulated in the developed settings, which is expected as these are often sites for repeat visits. Visitors were not found to associate socializing with others to any particular type of setting, contrary to the findings of previous studies (Backlund & Stewart, 2012; Pierskalla et al., 2004; Weber & Anderson, 2010).

The applied GIS methods had their advantages and shortcomings. Data on visitor experiences were collected using a web-based PPGIS survey. The data can be considered spatially precise, as mapped experiences were placed accurately on trails and experiences accumulated near the main recreation infrastructure. In addition, mapped experiences clustered close to the most visited sites of the park, which was also noted by Pietilä and Kangas (2015), who collected visitor experience data in Oulanka NP using paper maps,

witnessing the precision of the data. The data can also be considered representative, as the participants in the PPGIS survey represented well the general visitor profile to Oulanka NP. Overnight visitors were, however, overrepresented in the sample. This is not surprising, as participatory mapping requires knowledge of the place and significant time and effort from the participants (Brown & Kyttä, 2014). This bias is not considered to have a major effect on study results, as the mapped experience items do not differ according to the length of stay. As noted by Cole and Hall (2008), the length of stay may influence the intensity of experience more than the types of experience that are attained.

The tradeoff of using a PPGIS method, which succeeded in attaching visitor experiences to certain locations, are shortcomings in measuring the contextual dimension of visitor experiences. The major limitation of the applied method resulted from the interface used in the survey, which could display only a limited list of experience items. Therefore, technical improvements must be made to measure the dimensions of visitor experience more comprehensively if a similar research design is utilized.

The study piloted a new technique to classify a recreation area into setting types based on the classification criteria common to ROS. Using GIS tools, the study area was divided into four different settings ranging from primitive to developed. The success of this spatial classification process supports the existing evidence that GIS applications offer promising tools for identifying consistent zones of recreation opportunities systematically and objectively, compared with the common practice of generating setting classification manually using in-depth knowledge of the region of interest (Joyce & Sutton, 2009). The study raised, however, a question about the appropriate scale for classifying recreation settings. This study used a very fine scale approach by classifying each pixel (250\*250 meters) representing the study area into corresponding setting types. As experiences did not differ across these settings, a geographically broader-scale classification could offer a more meaningful premise



for researching and managing the diversity of visitor experiences. This could be especially justified in places like Finland, where recreation areas, such as national parks, are rather primitive with regard to the level of infrastructure and social interaction.

PPGIS methods include a diversity of techniques to collect spatial information on experiences. Based on the knowledge gained from this study, alternative ways to utilize GIS tools for studying the relationship between settings and experiences can be recommended. Mapping visitor experience could be conducted in a more qualitative manner to aid in getting a more holistic understanding of visitor experiences and their connection with visited settings. Many researchers have recently insisted that understanding visitor experiences requires focusing on the attachment and emotional relationship that visitors have towards the places they visit (e.g., Brooks, Wallance, & Williams, 2006; Dvorak, Borrie, & Watson, 2013; Manzo, 2003; Mitchell, Force, Carroll, & McLaughlin, 1993; Williams, Patterson, Roggenbuck, & Watson, 1992). PPGIS studies display promising tools for studying visitor experiences also from these perspectives (e.g., Brown, Raymond, & Corcoran, 2015; Davis, Daams, van Hinsberg, & Sijtsma, 2016; Lowery & Morse, 2013). Similarly, a more qualitative approach to defining recreation settings could better emphasize the variability of how visitors perceive the settings they encounter. Instead of using an objective GIS analysis to classify recreation settings, a PPGIS method could be used to ask visitors how they perceive and value the elements of the physical environment they encounter. Comparing the visitors' perceptions of recreation settings against their experiences could offer a more in-depth understanding about the relationship between visited settings and realized experiences.

Finally, this study approached the relationship between recreation settings and visitor experiences from a goal-directed mode, suggesting that managers can help to facilitate desired experiences by manipulating the recreation setting with management inputs (e.g., facilities, services, access) (Driver, 2008). This has been a tempting premise for studying the setting-

experience relationship, because it clearly demonstrates the managerial relevance related to the psychological outcomes of outdoor recreation (Manfredo, Driver, & Tarrant, 1996). However, this study and previous ones indicating that the association between settings and experiences is weak, decrease the motivation to approach the relationship from the goal-directed mode. Therefore, there is a call for techniques that better attach the idea that individuals play a large role in shaping the type and quality of the experience (Cole & Williams, 2012; Williams, 2009) with management frameworks and practices. Spatial techniques that acknowledge human interpretations of the environment can serve this link.

### **Conclusion**

This study examined visitors' experiences in Oulanka National Park and how the type of recreation setting affects these experiences. A new technique was piloted because previous studies on the setting-experience relationship have failed to capture the geographical context of visitor experiences, having a possible impact on the exploration of the relationship. The aim of this study was, therefore, to measure both visitor experiences and recreation settings geographically as accurately as possible, utilizing Geographic Information Systems. This study introduced techniques to (a) measure visitor experiences, (b) divide a recreation area into different kinds of recreation settings, and (c) compare visitor experiences against the setting types where they were realized and reported.

The findings of the study complement previous research, which has shown that the relationship between recreation settings and realized visitor experiences is faint. Therefore, the enthusiasm to research setting-experience relationships, suggesting that certain types of experiences result in particular visitor experiences, is questioned. It is suggested that qualitative forms of mapping visitor experiences and their geographical contexts could provide a more in-depth view of the relationship between settings and experiences.

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## Figure Captions

*Figure 1.* Location of the study area and the main recreation infrastructure.

*Figure 2.* An interface of the web-based PPGIS survey used to measure visitor experiences in Oulanka NP.

*Figure 3.* An illustration of the spatial classification process of recreation settings in the Kiutaköngäs area.

*Figure 4.* Spatial distribution of mapped experiences in the study area.

*Figure 5.* Visitor experiences across different setting types in Oulanka NP. Grey area shows the relative frequency of each experience item mapped within a certain setting type.