

# The 6<sup>th</sup> International Conference on Monitoring and Management of Visitors in Recreational and Protected Areas

Outdoor Recreation in Change  
– Current Knowledge and Future Challenges

Stockholm, Sweden, August 21–24, 2012



## PROCEEDINGS

Edited by Peter Fredman, Marie Stenseke, Hanna Liljendahl, Anders Mossing and Daniel Laven



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# Introduction

Welcome to the 6<sup>th</sup> International Conference on Monitoring and Management of Visitors in Recreational and Protected Areas (MMV). This publication is a collection of extended abstracts from five keynotes, 155 oral and 23 poster presentations. The main theme of the conference is Outdoor Recreation in Change – Current Knowledge and Future Challenges. This reflects not just changes in outdoor recreation participation and behavior alone, but also changes in management of recreational areas and society in general that will impact the future of outdoor recreation.

Sweden is globally known for excellent outdoor recreation opportunities based on a Right of Public Access. Participation has historically been associated with the Nordic 'friluftsliv' tradition, but more recently there are signs of changing recreation behaviors indicative of broader societal changes such as urbanization, globalization and technical developments, but also more specific factors like localized climate change, accessibility and resource management actions. In December 2010 the Swedish parliament voted for the government bill 'The Future of Outdoor Recreation' which was followed by a process where measurable goals were identified. One conclusion from this work was a call for both sound knowledge and high quality data in order to implement and evaluate policies serving the need of the general public. The MMV conference now offers an excellent opportunity to relate the Swedish experience to this broader international context.

The MMV provides a forum for presentations and other exchanges of ideas and experiences related to the monitoring and management of visitors in recreation and protected areas. The conference emphasizes policies, problems, practices and innovative solutions, and is therefore of equal relevance to managers and researchers. The first MMV conference was held in Vienna, Austria, in 2002 and following meetings have been in Rovaniemi, Finland (2004), Rapperswil, Switzerland (2006), Montecatini Terme, Italy (2008) and Wageningen in the Netherlands in 2010.

The organizing consortium of the sixth MMV conference is the Swedish research program Friluftsliv i förändring (Outdoor Recreation in Change) [www.friluftsforskning.se](http://www.friluftsforskning.se) – an interdisciplinary research program for the study of outdoor recreation and nature-based tourism supported by the Swedish Environmental Protection Agency. The program is a network involving 15 researchers from seven universities and colleges; Mid-Sweden University, University of Gothenburg, Karlstad University, Örebro University, Umeå University, Blekinge Institute of Technology, and the Swedish University of Agricultural Sciences.

The sixth MMV program covers a broad range of topics related to outdoor recreation and nature-based tourism. Different aspects of visitor monitoring and management of recreational areas are at the core of the conference, but the spectra of subjects in the papers clearly indicates a supply of related research which goes beyond these central themes. Each paper in this proceeding has been reviewed by the program committee and we hope you find this publication a useful overview of this field of research. A special thanks to Mrs. Hanna Liljendahl who edited all the submissions during the summer months, to Dr. Daniel Laven who improved the language and Ms. Lusine Margaryan who assisted in the proof reading.

*Peter Fredman  
Marie Stenseke*

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# Outdoor recreation in change – What about Sweden?

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## Outdoor recreation in Sweden

Experience-oriented encounters with nature have been developed in Sweden, as in other western industrial countries, since the end of the 19<sup>th</sup> century (Sandell & Sörlin, 2008). This has been done by using concepts like outdoor recreation, outdoor life (Scandinavian: *friluftsliv*, litt: free-air-life), outdoor education and nature tourism. The earlier establishment of these perspectives in Sweden, through outdoor-related organisations, was clearly connected to international inspiration and society's prosperous elite in the fields of science, the church and the military. Children's and young people's education and upbringing have always been important aspects, and both school and recreational interests in nature have been regarded as a national identity- and mobilisation tool. During the early 1900s, outdoor life activities and organisations were dominated by the upper class – and particularly by men, although a democratisation took place in Sweden in the 1930s in an attempt to encompass a wider public. Cycling holidays, youth hostels and camping became typical features of this outdoor expansion. After the Second World War, and parallel with the development of a post-war material welfare society, outdoor recreation also became increasingly "materialised" in the shape of holiday cottages, caravans, pleasure boats and advanced outdoor equipment. Today, at the beginning of the 21<sup>st</sup> century, the authorities are once again focusing on outdoor recreation and nature based tourism on the basis of public health, environmental engagement and regional development. From a population survey (Fredman et al, 2008), we also note that:

- about 40% of the population estimate that they "rather often" or "very often" spend time in nature during weekends and holidays;
- about half of the population estimate that as a child they spent time in nature "very often" during the holidays;
- the most important activities (over 80% participation) are "walking for pleasure", "forest walks/hikes", "gardening", "sunbathing" and "picnics";
- also, deep aspects such as "spending time outdoors usually makes me feel or sense that I and all other humans belong together with and are part of nature" are agreed on fully or in part by almost 80% of the population.

## Examples of current changes and challenges

### *Sportification and indoorisation*

Two examples of current changes and challenges with regard to outdoor recreation in Sweden are the interconnected tendencies of sportification and indoorisation (Sandell, Arnegård & Backman, 2011). While these aspects have so far not affected the broad public pattern of out-of-doors

in Sweden to any great extent, they are likely to influence the future situation in various ways. Modern industrial society is characterised by functional specialisations. Instead of being part of the hunt, fight, play and search for resources, sporting activities like running, jumping, throwing the javelin or dancing are turned into specific activities with specialised rules, time-limits, equipment, assessments and specially designed (often indoor) settings. Parallel to this successive specialisation of sport kinetic, cultures requiring uncontrolled spatial environments are also evident. Using concepts like outdoor recreation and nature tourism, recreational activities were established that were often more inspired by Romanticism's anti-civilisation ideals of other values and nature experiences than by industrial society's functional specialisation and cultivation of nature (Sandell & Öhman, 2010). Although these two traditions – competition-oriented physical exercise in controlled environments vs. nature encounters and experiences in uncontrolled environments – developed in parallel, they have often been in conflict with each other. Here, in these borderlands, the role of the nature experience, the ambition to control and opinions about competition and risk have all been recurring dividing lines. Strong signs seem to indicate that these borderlands are now being dramatically "renegotiated".

### *The future of the right of public access*

The right of public access is of fundamental importance for the public's visits to and presence in the countryside in the form of outdoor recreation and nature-based tourism in Sweden (Sandell & Fredman, 2010). In principle, it can be seen as the "free space" (Fig. 1) between economic interests, privacy and nature preservation/conservation. But the landscape itself must also "tell" the user about the possibilities and limitations of things like land use and time of year (e.g. how vulnerable the land is), weather (e.g. for lighting fires), visibility (e.g. how close one can be to a house). As with all stories, though, one has to learn to read, listen and interpret; something that is challenged in today's highly mobile and urbanised society with its intensified motorisation, privatisation and commercialisation. However, the *landscape perspective* of the right of public access, characterised by democracy, consideration, adaptation, multipurpose use and an integration of nature/culture, is important both as an educational tool and an illustration of sustainable development in the future.

### *The need for stable, long-term knowledge structures*

It is of utmost importance that stable, long-term institutional structures for research and monitoring and arenas for dialogue and knowledge transfer are established with regard to outdoor recreation and nature-based tourism in Sweden. Outdoor recreation in general has a limited research tradition in Sweden, although there are many signs of outdoor recreation habits in transition. There is also a

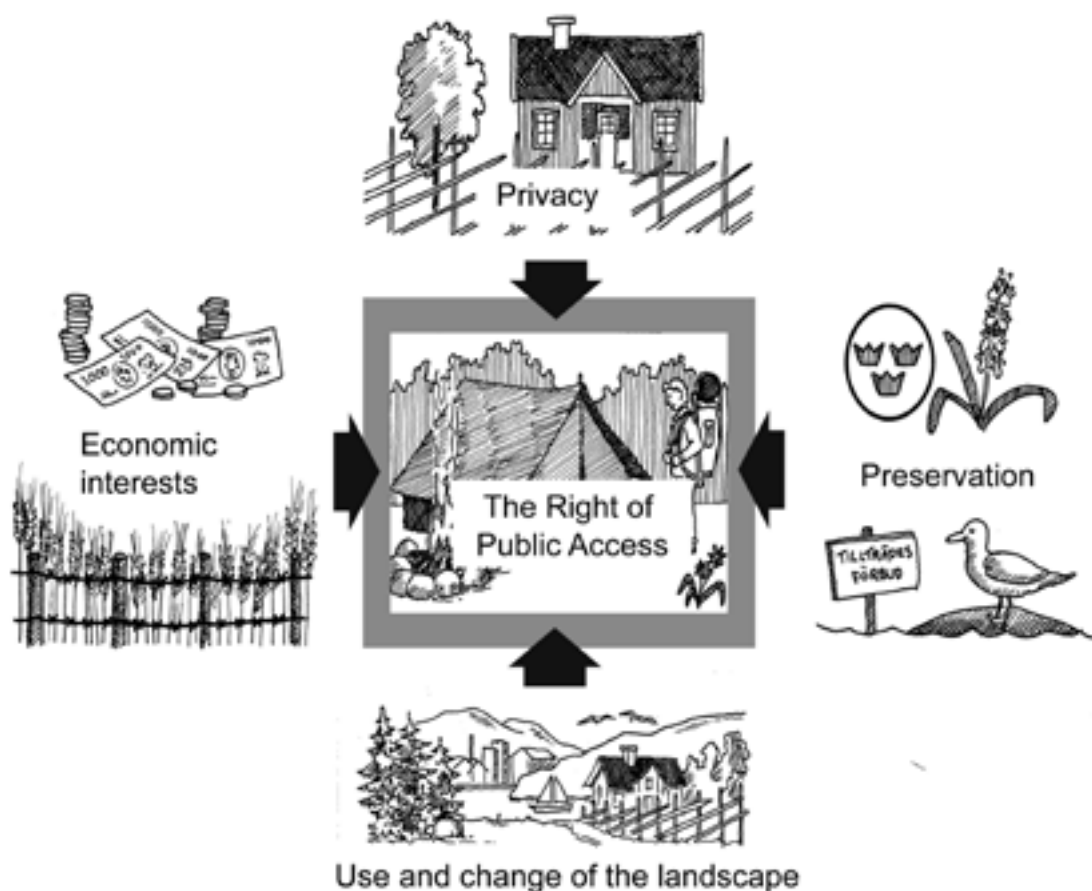


Figure 1. The right of public access as a “free space” between the limitations of privacy, economic interests, preservation and the use and change of the landscape (e.g. Sandell & Fredman, 2010; Drawing by Matz Glantz).

tension between this internationally influenced situation and an interest in discussing what the characteristics of a Nordic outdoor recreation tradition, including the right of public access, could be. Sweden is also an increasingly multicultural society, where terms, activities, norms and landscape preferences vary greatly. This is why the need for stable knowledge structures beyond the time span of our research programme has been an important objective of Outdoor Recreation in Change (Sandell, Fredman & Sten-

seke, 2011). In addition to ordinary scientific efforts, arenas like annual national conferences, public reports, newsletters and an informative website have been established. Maintaining these knowledge structures and other requirements for recurrent research and monitoring now has to be prioritised. Mainly due to financial hesitations, the outcome is uncertain, although there is still time for the relevant authorities to take action.

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# Challenges of visitor monitoring and management in protected areas

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Metsähallitus Natural Heritage Services (NHS) manages all the national parks and the other state-owned protected areas, wilderness areas, national hiking areas and public waters in Finland. NHS works to improve public well-being and the viability of tourism, as well as the state of biodiversity in Finland.

The aim is to provide services enabling people to get outdoors and enjoy activities that benefit their physical and mental health and well-being, without harming the natural environment. Well-planned services can get more people outdoors, promote nature tourism, and safeguard valuable natural features in the areas. To meet these objectives, NHS searches constantly for best practices. For example, setting up trails on beds made of stones and sand has proven to be cost-effective and user-friendly. Such methods can also be used to replace duckboard trails. The work of NHS in promoting outdoor recreation was recently granted a sports design award at the National Sports Gala to acknowledge the role and high quality of the services provided, including trails, picnic sites and signs, as well as visitor centres and wide-ranging internet services.

National parks are among Finland's main attractions for international visitors. In addition to promoting biodiversity conservation and public health, national parks bring visitors, income and employment to rural areas. Since 2000, NHS has been using a standardized method to gather visitor survey data from those state-owned protected and recreational areas where recreation and tourism play a significant role (Kajala et al., 2007). The data are gathered primarily for management and monitoring purposes and reports are produced by NHS at local, regional and national levels. However, the large data set gathered in a uniform manner across the country for eleven years, and saved in one database (ASTA), provides opportunities for further analyses, such as those on the local economic impacts of visitors' spending (Huhtala et al., 2010) and on customer segmentation (Konu & Kajala, 2012).

Investments made by the government for the provision of facilities for recreation in national parks and hiking areas are paid back to society through the opportunities they create for private enterprises and employment. In 2011, Finland's national parks alone welcomed 2.09 million visitors, whose spending brought income worth 108.3 million Euros and 1394 person-years in employment to the surrounding areas. Considering the costs of running their facilities, it corresponds to an overall 10-fold payback. These economic impacts are calculated using methodology devised by NHS and the Finnish Forest Research Institute on the basis of the data on visitor numbers compiled by NHS, the findings of NHS regular surveys on visitors' spending levels, and factoring figures that account for the cumulative impacts of visitors' spending in local economies.

To meet the new challenges of the constantly changing

world, NHS is in a process of revising its strategy and action plan with the aim of being an innovative, effective, flexible and well-networked organization also in the future.

The actions in the near future will include further strengthening of partnerships for sustainable nature tourism. In collaboration with the tourism sector, NHS will use the research findings on the customer segmentation of visitors in improving nature tourism services.

NHS will develop volunteer programs both to improve facilities and to maintain and restore the natural values of protected areas. NHS aims to be socially responsible through collaboration with many sectors. For example, it works together with the prison authorities providing them opportunities to use convict labour in protected areas in meaningful ways that help convicts to get back their self-esteem and ability to cope with ordinary working life.

The network communication has become an important source of information for national park visitors. Recently awarded NHS website Luontoon.fi (Outdoors.fi) has become well established and popular. It was expanded to include a web community. Users can share their experiences and photos of visits to national parks, take part in competitions, watch videos, and read the latest news from the Finnish parks, including stories on the everyday work of NHS rangers and other staff.

The ways in which the visitor centres serve customers, nature tourism service providers and local communities are constantly analysed and developed. So far Finland has lacked a single visitor centre attractively exhibiting the whole protected area system and connecting all the visitor centres together. To meet this need, NHS is currently building the Finnish Nature Centre Haltia in Espoo, on the fringes of both the Helsinki metropolitan area and Nuuskio National Park, together with various partners. In 2012, NHS opened the nature and culture centre of Pyhä-Luosto National Park and an expanded visitor centre at Liminka Bay, which features the area's birdlife and the wetland network of Ramsar sites.

The intangible values of nature, such as beautiful landscapes and opportunities to experience nature, are invariably the most important motives for the recreational use of protected areas in Finland. The recognition of cultural and spiritual values of protected areas increases and deepens the relevance of parks and nature to people (Mallarach et al., 2012).

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# Current and future issues in natural area tourism with a special focus on visitor monitoring

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## Key issues for natural area tourism

Tourism is becoming one of the largest and fastest growing economic sectors in the world. The number of tourists has grown from 25 million in 1950 to 940 million in 2010 (UNWTO, 2011). Nature tourism has increased from about 2% of all tourism in the late 1980s to about 20% today (Buckley, 2009). With this increase is the view that nature tourism is morphing with sustainable mass tourism. Weaver (2012) attributes this change to natural resource scarcity, the development of green technology, and awareness of climate change. The associated dramatic increase in visitor numbers to natural areas makes visitor monitoring of paramount importance.

Another key issue is the recent movement of the debate about naturalness as a goal for natural areas, to a re-focus on the overarching management goals. Hobbs et al. (2010, 483) suggest taking 'a pluralistic approach that incorporates a suite of guiding principles, including historical fidelity, autonomy of nature, ecological integrity, and resilience, as well as managing with humility' (Hobbs et al., 2010, 483). Such an approach emphasises the importance of objective-based management, where monitoring is clearly directed towards determining if objectives are being met.

Visitor monitoring is also integral to improving management effectiveness, an increasing priority for natural area managers. The Programme of Work on Protected Areas adopted by the Convention of Biological Diversity in 2004 commits signatories to monitoring, evaluating and reporting on protected area management effectiveness and using the information to improve management. Over the last decade the IUCN WCPA's PAME Protected Area Management Evaluation assessment methodology has been widely applied, with visitor management being one of 34 headline indicators (Leverington et al., 2010).

Given these compelling reasons for monitoring visitor use of natural areas it is surprisingly still a neglected activity. Buckley et al. (2008) report a weak match between reported management priorities and monitoring programs, and little knowledge of what visitors do. This lack of knowledge suggests paucities in both visitor research and monitoring. These authors emphasize that monitoring is essential in today's society where evidence is increasingly required regarding the effective, efficient use of limited public financial resources.

## Recent advances in monitoring and measurement

Given this policy backdrop, recent advances in monitoring are very much directed towards cost-effective, accurate ways of collecting data on visitor movements, activities, impacts and aspirations.

Remote technologies are a burgeoning field. Develop-

ments in walk trail monitoring are illustrative. Walk trails can be accurately located using global positioning systems (GPS) (Newsome & Davies, 2009), with locational and management data entered in a geographic information system (GIS), along with other spatial data, and then the resultant data sets manipulated to describe trail status and explore management options (Marion et al., 2011). Airborne radar is being increasingly used to locate walk trails and describe their condition (e.g. Kincey & Challis, 2011). Leung et al. (2011) have developed indices, using GIS, to describe the ecological fragmentation created by the proliferation of walk trails. Spatial analyses continue to be acknowledged as essential for planning and management of natural areas (Yuan & Fredman, 2008).

Developments in campsite monitoring relate to efforts to be more cost-effective in monitoring, through careful selection of sampling strategies and moving away from idealized census-based approaches (which are impractical given the limited resources available and the large areas over which camping can occur). Newman et al. (2006) used a GIS to help identify areas where campsites had a high probability of occurring and used this information to develop a sampling strategy for Yosemite National Park. Digital photography and subsequent software analysis are being pursued as a more accurate and cost-effective means of recording and analyzing campsite impacts (Monz & D'Luhosch, 2010).

Remote technologies are also permeating visitor monitoring. Visitors to walk trails can be counted using infrared, photoelectric and seismic pads as well video and still photography. Mass-produced locational (e.g. GPS) and communication devices (e.g. mobile phones) have enabled collection of movement data over time for visitors (Warnken & Blumenstein, 2008). Such data may be location restricted or location independent (i.e. GPS based). For the former, sensing may be passive (e.g. track counters), from a reflected signal (e.g. laser) or from a specific signal (e.g. radio frequency identification tag, mobile phone tracking).

Visitor monitoring continues to focus on crowding as measure of social conditions and visitor satisfaction (Manning, 2011). Recent advances include using animation of visitor use of walk trails to investigate visitors' perceptions regarding resource, social and managerial conditions, including the speed of visitors (e.g., Reichhart & Arnberger, 2010). To gain greater insights to the effects of crowding, researchers have investigated displacement and the contributing factors. Digitally depicted trail scenarios with different combinations of user types, group sizes, compliance behaviour and direction of movement were used by Arnberger and Haider (2007) to determine influential social factors.

The richness of methods associated with visitor perceptions is being enhanced by concepts and measures from

marketing, in particular service quality. Service quality monitoring generally determines visitors' satisfaction with a range of services and facilities, such as the friendliness of staff, the cleanliness of facilities, and the quality of information. Given the focus on facilities, such an approach is most relevant to developed sites and parks, not wilderness areas. Such monitoring also usually asks visitors about overall satisfaction with their visit. Park agencies worldwide use the latter measure in corporate reporting as a measure of the efficacy of their visitor management.

Importance-performance analyses (IPA) provide a simple means of reporting on visitor satisfaction with individual facilities and services. They are increasingly appearing in natural area tourism research. Such analyses are used by the US Forest Service to indicate which attributes, on which national forest, require management attention (i.e. those attributes where importance exceeds performance) (USDA FS, 2012). Recent analyses in Australia have used IPA to benchmark the performance of attributes in national parks

and reserves across Western Australia. Such benchmarking shows where there is exemplary performance of attributes and where further efforts are required. In this Australian study, staff friendliness was exemplary, whereas the quality of information required further management attention (see Taplin & Moore, this proceedings, for further details).

How to accurately count visitor numbers to a park system remains a vexed question (Griffin et al., 2010). Several state park agencies in Australia have resolved this by conducting phone-based community surveys. Respondents are asked about parks they have visited in the last four weeks and the results are used to estimate total visitation. Griffin et al. (2010), in their review of visitor data collection and use, recommend this approach as the most accurate, cost-effective way to obtain annual visitation numbers.

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# Managing difference in shared recreational space: Understanding the role of the body, movement and emotion

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This paper examines the normative role of emotions and the body in shaping the regulation and negotiation of outdoor access by different actors, focussing on situations of sharing outdoor space across difference.

## Differentiation of outdoor recreation troubling established norms

Although in most countries there are laws and formal rules and codes framing rights of public access, the disciplining of outdoor recreation leans heavily on informal norms to delineate and ‘police’ appropriate ways to behave in particular places and situations. This is due not least to outdoor recreation being a diffuse activity spread over large areas, managed with limited resources. However, the increasing differentiation of participants is unsettling established norms of outdoor recreation. People from a greater diversity of cultural backgrounds are being encouraged to use the outdoors, and the range of recreational activities being undertaken has expanded greatly. In some countries, access legislation has codified a multi-use ethic. For example, in Scotland, access rights are defined inclusively allowing all non-motorised forms of transport access to most land (as long as undertaken responsibly). This approach to access brings with it the imperative to *share*, and, moreover, the need to find ways of sharing space across *difference*; including both social and species difference. Even where zoning approaches are preferred, such segregatory management responses become increasingly difficult to implement in an increasingly differentiated recreational world. So the challenge is to understand and manage the sharing of space so that different recreationists can not only co-habit, but can also flourish and enhance their wellbeing. This means looking in more detail at how informal norms operate and evolve in shared recreational space.

This is done here using the example of Scotland where the recently changed legal framework of access rights and responsibilities – centring around the Land Reform (Scotland) Act 2003 – provides an excellent real-life laboratory for examining how a diverse set of users, some of them newly clarified as ‘legal’, learn to live with each other. It draws upon a study conducted principally in the Cairngorms National Park, which employed techniques of Mobile Video Ethnography (MVE) with cyclists, walkers and dogwalkers. Data was collected in three main stages: a biographical interview; an outing in which the head/helmet-mounted minicam video camera was worn by the participant, and; a post-outing interview in which the video footage was used as prompt to in-depth discussion. This allowed an intimate examination of bodily movements, experiences and encounters, and how they were made sense of by different recreationists.

## Role of the body and emotion in (re)drawing normative boundaries

The paper examines how norms of outdoor access develop through practices and interactions ‘on the ground’, with a particular focus on how moral force is exerted through the positioning and movement of the body and the expression of emotions. Scholars are increasingly taking emotion and affect seriously in explaining social practices and behaviour, showing their central influence over our sense of our selves and surroundings, and how we tie together past, present and future actions (e.g. Davidson & Milligan, 2004; Tolia-Kelly, 2006; Bondi et al. 2007). The importance of emotion and affect in outdoor recreation – including in conflicts between different users – has been made clear (e.g. Heywood, 2002, Vittersø et al. 2004), but there is little work that has developed the debate further.

To address this I consider outdoor access and its regulation in terms of affective economies; a concept developed by Ahmed (2004) which emphasises the relationality of emotion, seeing it as not simply residing in individual bodies but as circulated between people in relationships of difference, and in relation to particular places. In affective economies, “emotions *do things*, and they align individuals with communities – or bodily space with social space – through the very intensity of their attachments” (Ahmed, 2004: 119). In this way recreationists do not just *have* emotions, their emotions do work in binding subjects together or driving a wedge between them.

## The affective economies of outdoor access

The discussion begins by introducing some of the emotions this study found to be influential in outdoor access (see Fig.1) and the main ways in which they play a role in shaping behaviour. These relate to feelings desired, experienced and expressed. Next I elaborate three examples of affective economies of outdoor access and recreation emerging from the study, regarding: off-lead dogwalking, mountain biking in upland areas, and trail encounters between walkers and mountain bikers. Each example illustrates some important ways in which bodies and emotions play a part in creating, reinforcing or reworking the normative boundaries contested amongst and between different social groupings.

We find that recreationists can learn simple and quite sophisticated ways of sharing space across difference. There is evidence, for example, of the tacit trading of realising and conceding desires between different users. A fluid calculus of desire is implicated in which aspects such as prior experience, expectations or mood influence how effective particular forms of affective artillery will be. Nevertheless, more dysfunctional dynamics can also unfold, which can lead to de facto exclusion of particular users or their acceptance of





Figure 1. Emotions at work in outdoor access and recreation

a 'deviant' position. What is of interest here is why affective economies follow one dynamic rather than another, and the various factors influencing this. I explore in particular recreationists' insider/outsider status with respect to particular groupings, how it can change (or not) with repeated and particular encounters.

The paper concludes by considering how we can incorporate insights regarding the body and emotions into managing difference in outdoor spaces. A key question is how we can encourage affective economies that evolve constructive rather than dysfunctional dynamics as regards space sharing, for example, cultivating empathy over antipathy. There is certainly scope to do better where negative encounters stem from misunderstandings. This question in turn raises issues of power, including: who is favoured by current dominant normative positions; whose norms everyone is to coalesce around; the differential power of recreationists to

affect and be affected, and; the different sources of affective agency (ranging from legal, historical, and institutional power, to the agency of bodies, movement and infrastructure).

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# Attitudes, norms and the art of visitor management

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Research on visitor management has come a long way since I was asked for advice on carrying capacity studies at Grand Canyon National Park some 40 years ago (see Shelby and Heberlein, 1986).

## The cognitive fix

What hasn't changed as much, however, is a focus on attitudes as a cause of visitor behavior and even more dangerous the hope that we can change human behavior and solve environmental problems simply by "educating the public." This cognitive fix as I call it (Heberlein, 2012) relies on two false assumptions; 1) that attitudes have a lot to do with behavior and 2) that we can change attitudes with information.

Attitudes do change, of course, although often slowly and in ways that are hard to predict. It took Aldo Leopold, the US wildlife ecologist and environmental philosopher, more than 30 years to change his attitude toward wolves. Even then, shortly after he wrote his famous pro-wolf essay "Thinking Like a Mountain," he voted to restore bounties on the last few wolves in Wisconsin. Leopold is not atypical or unusual. There is a well known gap between what we say and what we do.

Attitudes have something to do with behavior of course, just not as much as one would think. In our recent study of attitudes toward hunting, we found that all of the hunters liked hunting, and none of the anti-hunters, hunted (Ljung et al. 2012). The bulk of the sample (75%) however *liked* hunting – but *did not* hunt. Hunting is a behavior, not an attitude. To hunt one must be part of social network of hunters, learn how to hunt, and have the skills, opportunity, and resources to hunt. As is typical, attitudes in this study accounted for <10% of the variance in behavior. A positive attitude was a necessary but not sufficient condition for hunting. As the number of hunters decreases, some hope to reverse the trend by changing attitudes toward hunting. But how will that play out when 8 out of 10 *already have positive attitudes toward* hunting and does anyone think seriously we can increase hunting participation by converting anti-hunters?

This does not mean that attitudes are unimportant. What if the non-hunters in our sample who currently like hunting (75% of the total) had a negative attitude instead? If it was only hunters who liked hunting, the sport would have a dim future. Attitudes are important because they frame our social choices, not because we can change them at will. This is my answer to a biologist who recently lamented – "You keep studying attitudes, but they don't get any better." We need to understand attitudes to design with them, not to try to manage visitors by changing their attitudes.

Because of the problems of the cognitive fix or the "knowledge deficit model" as others have called it (Schultz, 2001), social psychologists have turned to norms as a way

to influence environmental behavior.

## Norms

In visitor studies norms have been used as a standard to evaluate situations, the behavior of others and determine how many is enough (see Vaske et al. 1986). But they are even more important as factors that influence individual behavior. The observed behavior of others, internal sanctions of guilt, shame, and pride along with anticipated informal sanctions are strong drivers of human behavior. Norms frequently trump attitudes.

I discovered the power of norms the hard way. In an effort to get a sample of litterers to test norm activation theory I handed out useless handbills to tourists. Because fewer than 2% littered, it took over 7,000 hand bills to get a large enough sample for my analysis. Others have since found that middle class visitors to American parks by and large do *not* litter. This anti-littering norm was successfully applied in a state park in Wisconsin by removing litter barrels. Litter failed to increase and funds for emptying barrels were used for other purposes. 'Keep America Beautiful' found they could focus an *existing* anti-littering norm simply through imaginative advertising. Nobody's attitude was changed, but road-side litter was reduced through norm focus.

## Direct experience

In my efforts to understand environmental attitudes I have found four principles helpful, one of these, the direct experience principle, came into play at the Grand Canyon. Visitors who floated the river were about equally satisfied with an oar-powered or a motor-powered trip. On the other hand, anyone who has run the river in a boat with oars versus a boat with a motor sees huge differences. The problem was visitors who were surveyed went on only one trip, so they had no experience on which to base a judgment. To remedy this Bo Shelby (1981) randomly assigned visitors to oar-powered and motor-powered trips. Several days later they switched trips. The final survey of visitors with both experiences showed, eighty-seven percent preferred oars and four percent preferred motors. Nine of ten said oars gave a better experience of the canyon. They described the motor-powered segment as "loud," "noisy," "big," and "crowded." In contrast, the oar-power segment was described as "quiet," "relaxing," "natural," and "friendly."

## Thinking beyond the rim

Those of you who have been in the canyon lately, may have noticed that in spite of these compelling attitude data there are still motors pushing big rafts down-river. One explanation for science failing to influence policy is that few managers read studies and even fewer believe them (especially social science). Aware of this, the planning team persuaded the brass from Washington D.C. to take a "best of both"

trip. Once this group experienced both, they were further committed to removing motors from the Grand Canyon.

A powerful U.S. senator and the perceived interests of small Utah communities trumped science and the best judgment of National Park managers. Rather than blaming politics for this setback, we must consider the science. I was the primary designer of NPS visitor studies to establish social carrying capacities. But all the science I recommended was in the canyon. There's more to managing a river than studying the attitudes, behaviors, and even the norms of its visitors. We should have worked beyond the canyon's rim to better understand the small raft-rental industry. How would the rules affect them? What alternatives did they have? Were there ways they might have accommodated the phase-out that would have made their jobs easier and made them more money, while also helping the communities and giving visitors better experiences? Attitudes are important, but we need to think beyond the rim for successful visitor management.

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# Visitor monitoring from a management perspective – Experiences from Sweden

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## Introduction

Outdoor recreation and nature-based tourism are two increasingly important uses of Swedish landscapes which put greater demands on high quality visitor data. In order to support and develop outdoor recreation statistics and visitor monitoring, it is important to analyze what kind of methods managers use and their experiences from using them. In many recreation areas different interests need to co-exist. Visitor monitoring can provide knowledge that supports management of visitor experiences, visitor needs, motives, hindrances, as well as planning of future developments of outdoor recreation and tourism (Kajala et al., 2007).

This study reports preliminary findings from an evaluation of visitor monitoring in Sweden from a managerial perspective. Questions asked include *how* and *why* information on visitors is collected and used in planning and management. Several different visitor monitoring methods are available (e.g. visitor counters, observations, interviews and questionnaires) that can measure outdoor recreation and nature-based tourism participation. The applicability of these methods depends, e.g. on what kinds of questions are to be answered, the type of area, what activities are to be studied and number of visitors.

## Method

For this study, 12 management representatives of Swedish nature areas were selected to participate all of whom had used different visitor monitoring approaches within the last five years. The selection of managers was based on the methods used and the geographical representation of different nature areas (both densely populated and more peripheral regions were considered). The semi-structured telephone interviews were carried out in March 2012 and consisted of questions regarding the methods used, the reasons for executing visitor studies, the managers' experiences and their reflections on future use and thoughts regarding development of new methods. A short questionnaire including 22 statements concluded the interview where the managers were asked to evaluate the use of information from their visitor studies for different purposes. The interviews (40-60 minutes long) were recorded but also noted down.

## Results

### *Visitor counters*

Visitor counters was the most common method among the interviewed managers, followed by questionnaires while personal interviews, focus groups and observations were the least used methods. Visitor counters was also the method which was most continuously used in longitudinal studies. The costs for the methods varied depending on the number

of visitor counters, if a consultant had been engaged or not and whether the visitor study had been included in a project which financed the study.

Visitor counters were used to get knowledge of the number of visitors and their patterns of movement in the nature areas during different time periods. The results were often gathered in databases and in some cases summarized in written reports. Information from visitor monitoring was primarily used to apply for money when managers thought that numbers and statistics were an effective means to communicate with decision makers. Another important use was to get a foundation for future decisions and as arguments in negotiations between managers and other stakeholders. Results were, however, not always perceived as reliable since some of the informants also experienced problems with the equipment and with the field workers' engagement. The need of creating an understanding of the purpose of visitor studies among the field workers was believed to be of large significance. Furthermore, the methods used for visitor counters differed among the managers, who had different experiences in terms of education and guidelines, how to use and apply the methods, handle the equipment and read the data. The managers were in agreement that knowledge of the area's landscape characteristics in combination with visitor use is fundamental when using visitor counters.

### *Questionnaires, interviews, observations and focus groups*

The managers' reasons for doing visitor monitoring (i.e. questionnaires, interviews, observations and focus groups) were to get knowledge why people visited an area, as well as their attitudes regarding the area, services and management. The results of this type of methods were also thought of as a complement to the data of visitor counters. It was perceived to some extent as being time consuming and expensive to use questionnaires and interviews. In the development of the questionnaires, some of the managers had solved this problem by copying questions from other investigations since this approach was sometimes perceived to be a difficult task. One of the managers in the study thought that visitor monitoring requires experts and previous experience at a 'research level'. In daily operations, there are no such resources available as managers need easy and fast answers to be used in their work.

### *Evaluation of information usage*

Figure 1 shows the results from the short questionnaire evaluating the usage of visitor survey information among the managers. Visitor counters were mainly used to get an understanding of (i) how many people that visited the nature area, (ii) trends in visits and visitors over time, and (iii)

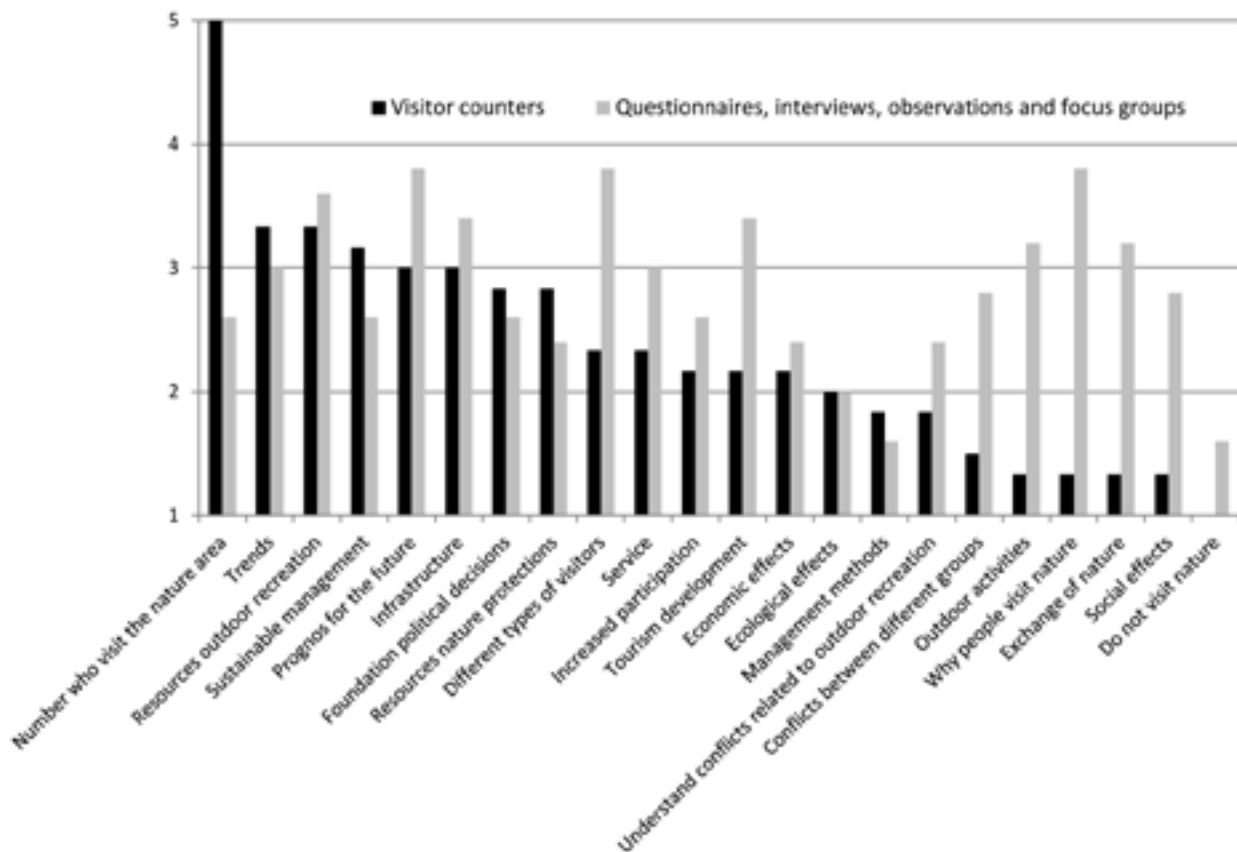


Figure 1. The managers' use of visitor counters and other monitoring methods evaluated on a scale from 1 (not at all) to 5 (to a large extent).

arguments for more resources to recreation management and nature protection. The results of other methods used were to (i) make prognosis of future visitation and usage, (ii) identify different types of visitors, and (iii) map out why people visit nature.

## Conclusions

The aim of this study was to analyze the purpose of visitor monitoring, to identify managers' experience of methods used as well as the practical use of monitoring data and results. Information for further improvements but also further research is also provided. Even though most managers know that different methods provide different information, and therefore would like to use or combine different methods, the lack of financial resources, time and understanding how to apply new methods are identified as

hindrances. Most of the managers want to use visitor monitoring data in their daily work, but are not fully there yet. How to reach decision-makers with this type of information is another issue pointed out in the study. In addition, there is no national coordination of collected visitor data, nor any co-operation between the local managers of Swedish nature areas, which could be another way to further progress methods of visitor studies as well as the actual use of the results.

# Tourist distribution in time and space: A case from the Icelandic Highlands

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## Introduction

Of the foreign tourists in Iceland 82% come to enjoy nature, 40% of them visits the Highlands and 70% of all overnights in the Highlands are in the South. The southern Highlands are therefore extremely important for Icelandic tourism. They contain Landmannalaugar the most important Highland destination, and Laugavegurinn, the most popular long hiking trail in Iceland. Until now no reliable data has existed about the number of visitors or their distribution in time and space which makes it difficult to maintain the area and plan its future use in a sustainable way. Lack of visitor use data can also lead to tourism being undervalued in public policy.

The data available about the number of guests has been overnight statistics collected by Statistics Iceland and results from questionnaires where guests at exit points in Iceland are asked where they have been. The overnight statistics are for privacy law reasons only available for large areas. The results from the questionnaires are unreliable in that they rely on the memory of guests and their knowledge of place names (Wolf, Hagenloh og Croft, 2012). In this project vehicles are counted by mechanized counters that record traffic on an hourly basis on all access and internal roads in the area. From the number of vehicles the number of visitors is estimated by hand-counting the number of visitors per vehicle at selected destinations. The work and results described here are a part of a larger project that aims at defining how the tourism sector wishes to use the Highlands in a sustainable way.

## The study area

The Fjallabak area consists of two travelling regions, Fjallabak North and Fjallabak South. They are separated by a mountain ridge with extensive geothermal areas, that is a popular hiking area, and the glacier Torfajökull. Access to the North is through three routes and to the South by five routes. These are gravel tracks with unbridged rivers only useable by four wheel drive vehicles. Except for a track that is only open for special 4x4 vehicles, there are no roads connecting the two areas so the areas can be treated as separate tourism regions. The North is heavily visited and contains the very popular destination Landmannalaugar and the huge volcanic fissure Eldgjá. Results from questionnaires show that some tourists consider there are too many other tourists in the area and that the present target group is being replaced by more service oriented guests. The south part is much less visited.

## Method

The Highlands are only open to mechanized traffic from late June until late September and there are a number of access roads. Counting the visitors and mapping their dist-

tribution is difficult during the short season and requires methods that are reasonably cheap and easy to apply. In 2011 counters were set up on twelve access and internal roads in the Fjallabak area and motorized traffic was recorded on an hourly basis. A researcher spent a week at one of the tourist destinations where the number of visitors per vehicle was counted, as well as the proportion of buses versus private cars. That gave the average number of persons per vehicle (6,24) and from that and the number of vehicles counted by the counters, the number of visitors was calculated.

Counting cars and people with mechanized counters has been widely used for example in the USA and the US Forest Service has published detailed instructions on how these should be performed (Yuan, Maiorano, Yuan, Kocis og Hoshide, 1995). The method is cheaper and easier to use than counting individual tourists and with calibration gives reasonable estimate of the number of visitors to an area and a good indication of changes with time. The method has not been much used in Iceland. The author has used it to determine the number of visitors to the Laki area in 2007 (Sæþórsdóttir, Ólafsdóttir og Ólafsson, 2009) and in the Kjölur area in 2009 and since June 2010 in Vatnajökull National Park in Skaftafell.

The counters used are produced by the Canadian company TRAFx Research Ltd. They come in a 10x15x5cm water resistant plastic box and use a tiny magnetometer for detecting vehicles. They are very easy to use as they can be placed in the roadside where they will detect vehicles 6 m away. No road cuts, special tools or calibration is required. Data is collected as hourly totals which gives f.ex. the options of finding the average traffic per hour over 24 hours, but daily counts and total counts over the season are mainly used.

## Results

From the number of vehicles (Figure 1) the number of visitors travelling through the main routes during the summer of 2011, as well as the total number of visitors to the area and its main destinations was calculated. The results show that about 150,000 visitors came to the Fjallabak area in 2011. From questionnaires it can be seen that the ratio of foreign versus local tourist varies somewhat between destinations but foreigners are about 85% at the most visited destination Landmannalaugar (Sæþórsdóttir, 2010). This means that more than half of all foreign visitors to Iceland during the summer season visit the area.

Almost everyone that travels through the area visits Landmannalaugar, over 120,000 visitors in 2011. The traffic falls sharply already in the middle of August while road and weather conditions are still good, indicating that the season could be extended. The North is much more visited, about 120,000 visitors came there during the summer

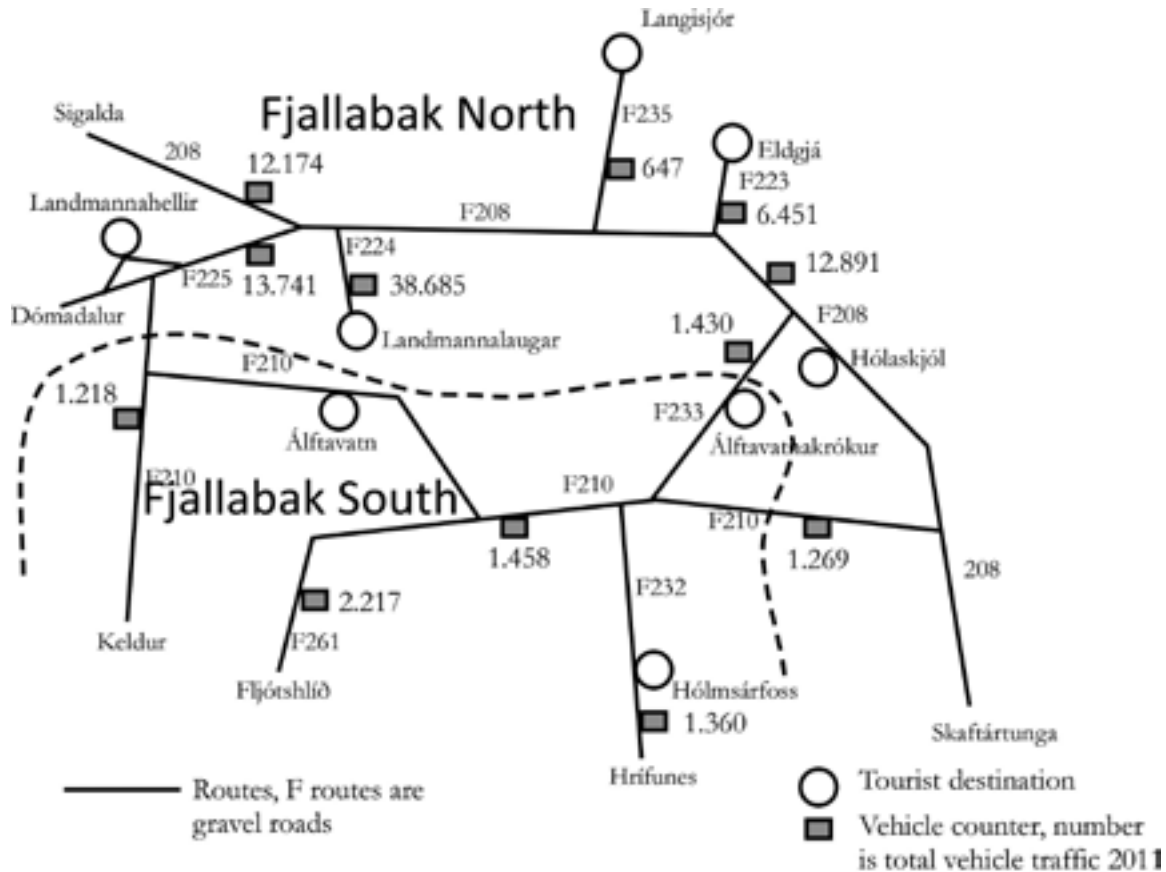


Figure 1. Routes in the Fjallabak area and position of counters with total number of vehicles 2011.

2011, but only about 25,000 visited the South, indicating that with better infrastructure the South could take some of the load off the North. Comparison with data from the The Icelandic Road Administration from 1995 and 2007 shows that traffic on the main access road to the North doubled from 1995 to 2007 and doubled again from 2007 to 2011 which gives an indication of the steep growth in tourist traffic in the Fjallabak region. In the South the increase in traffic from 1995 to 2011 is only about 50%.

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# Counting visitors in alpine areas: how sensor range, clothing, air temperature and visitor volume affects passive infrared counter accuracy

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Terrestrial ecosystems at higher elevations and latitudes tend to be more sensitive to human impact and slower to recover than tempered or more nutrient rich ecosystems (Forbes et al. 2001; Müllerová et al. 2011). Yet such landscapes are also popular tourist destinations, particularly in the mountains. Sustainable tourism in sensitive natural areas demands that managers have accurate estimates of the number of human visitors such areas receive. Here we investigate the effect of technical errors on the accuracy of an automated pyroelectric counter commonly used to record visitor numbers in natural settings. Our tests assessed areas of potential counter error, and offer suggestions for how area managers in various settings can deploy and maintain counters to limit the effect that such errors can have on visitor number counts.

The Eco-Counter Eco-Twin, with a middle range Pyro lens, is a model widely used worldwide for counting visitor numbers by detecting body heat emitted by passing pedestrians. While these counters are often deployed in natural and mountain settings, results accuracy tests published in the scientific literature were from tests conducted in urban settings. We conducted four trials that investigated counter accuracy with respect to visitor attire, ambient temperature, visitor passing distance and visitor volume. Individual counter error rates exceeded manufacturer stated accuracy ( $\pm 5\%$ ), but group means were not significantly different from manufacturer's claims (Figure 1). In general, counters under counted visitors at below freezing temperatures and over counted visitors at temperatures above  $0\text{ }^{\circ}\text{C}$ . Counter accuracy was also less at greater distances to the counter lens (up to 4 m) in both warm and cold conditions, but group means again did not significantly exceed manufacturer claims. One notable concern is that counters only detected the passing subject at  $-18\text{ }^{\circ}\text{C}$  when she was wearing a fleece jacket, and did not detect her at all when she wore attire that was more appropriate for such temperatures.

Variation among counters was low at both 2 and 4 m distances for trials conducted both indoors and outdoors. Only at a 4 m distance did one counter deviate significantly from the others ( $F_{6,77} = 4.637$ ,  $p = 0.001$ ), but its mean error rate was still within manufacturer claims. We used the Norwegian Birkebeiner cross country ski race in the trial that investigated the effect of varying visitor volume, and recorded 5574 skiers passing counter sensors over a 2 hr period.

This frequency range is the equivalent of one visitor passing every 1 to 1.7 seconds, and is far beyond visitor volume where this type of counters are used in Norwegian natural settings but certainly relevant for urban environments. Variation among counters was minimal, and we observed a

significant ( $F_{1,71} = 8.60$ ,  $p = 0.005$ ), and weakly negative ( $r^2 = -0.331$ ) relationship between increasing visitor volume and error rate.

Our tests demonstrated that air temperature, distance to the counter, type of clothing and visitor volume can all affect counter accuracy within the range of conditions in which they are used for monitoring visitor numbers in Norwegian natural areas. However, these results also provide guidance for how counter accuracy can be improved when planning site location, installation, and monitoring and we believe these principles are applicable to other counting systems. Counter accuracy was acceptable when visitors pass within 2 m of counter sensors. The accuracy diminished dramatically at 4 m distances in tests when the counters' sensor sensitivity was manually decreased (-1 setting) as suggested by manufacturer: an effect further compounded by cold temperatures. In tests where sensor sensitivity was set to "Standard," however, we obtained counter readings that were within five percent of true values. Counter installation should therefore be as close to the trail as possible to ensure that people pass within short range. In situations where this is not practical, sensor sensitivity should be adjusted to match the distance between visitors and counters.

Infrared sensor accuracy should increase with decreasing air temperatures, because colder air generates a greater contrast between ambient temperature and body temperature of passing subjects. For tests within moderate winter temperatures (between  $0\text{ }^{\circ}\text{C}$  and  $-20\text{ }^{\circ}\text{C}$ ), counters over reported visitor numbers – even at a reduced sensor sensitivity setting – but within manufacturer's claimed accuracy. The variation in accuracy levels and the systematic way in which counters deviated from actual visitor numbers indicate that sensitivity settings need to be tailored to the specific settings and uses. Colder temperatures may require decreased sensor sensitivity to avoid over reporting visitor numbers, but not if counter sensors cannot be mounted within 2 m of where visitors will pass. Warmer temperatures ( $> 10\text{ }^{\circ}\text{C}$ ) should not require decreased sensitivity. Counters should also be tested at their installation sites to fine tune sensitivity settings to match site layout and microclimate and establish correction coefficients when necessary.

Counters sensitivity should also be refined seasonally if they are deployed for long periods so that sensitivity reflects changing temperature and visitor attire. It is also important to install the lens parallel to the ground surface and directed towards a background (e.g. open air or cliffs) at a sufficient height (1 m) that eliminates the risk of counting non-human activity in the background of the counting location. We recommend exercising caution when using this kind of counters in wintertime, especially in very low temperatu-



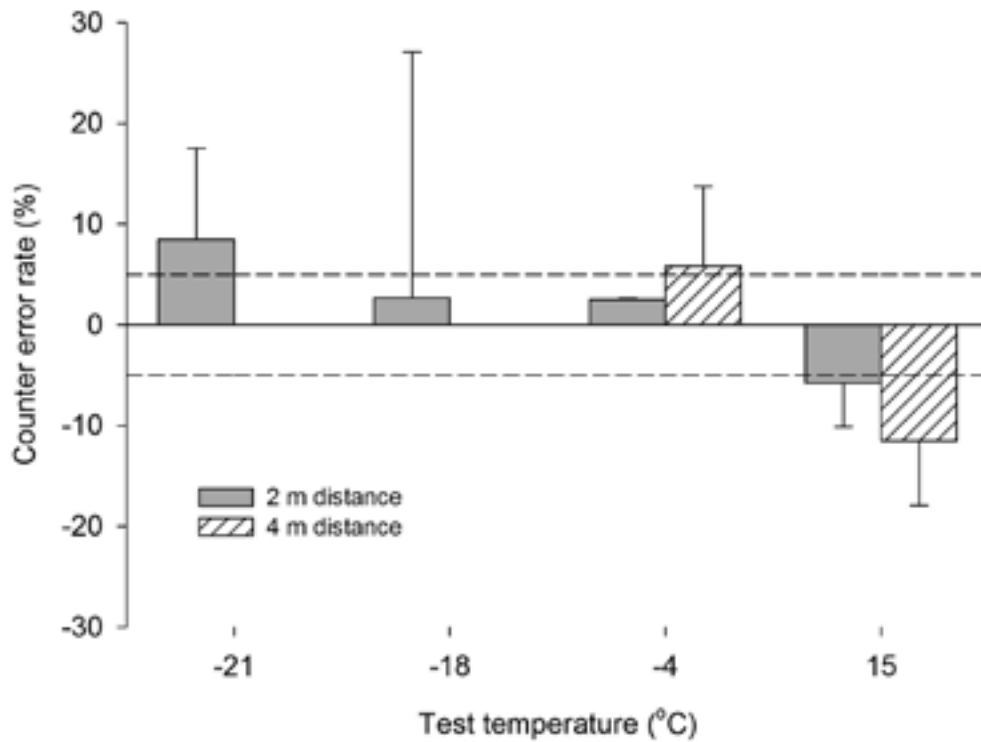


Figure 1. Mean error levels (%) from tests of visitor counter accuracy in varying air temperatures and distance from sensor. Dashed lines indicate the manufacturer's claimed accuracy range ( $\pm 5\%$ ), and error bars represent 1 SE. The test at 15 °C was conducted indoors, while results for the remaining three temperatures were from an outdoor test.

res. It is crucial that efforts to count park visitors include consideration of potential sources of error in the planning, installation, monitoring of counters and calculating correction coefficients for each counter and site, regardless the counting system in use.

# MTB monitoring in Arrábida Natural Park, Portugal

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## Introduction

Recreation activities in protected areas are increasing worldwide, demanding additional and better monitoring to provide clear management strategies. Protected and classified areas in Portugal are no exception to this trend. Nevertheless, contrary to what happens in several countries where nature/ecotourism is a well-established touristic product with proper monitoring and developing strategies, little is known regarding this phenomenon in Portugal. The potential of these territories for tourist and recreational activities is enormous, but like all resources it needs to be fully known and understood in order to be properly managed.

## Study area

The Arrábida Natural Park (figure 1), located within the Lisbon Metropolitan Area (near 2,5 million inhabitants), is facing a growing pressure from recreation mainly due to open-air activities like trekking, Mountain Biking (MTB) or Geocaching. Although “Sports Nature Plans” are mandatory by law since 1999, it doesn't exist for this protected area yet, due to lack of information and well-defined systematic methodologies. Like in all other protected areas in Portugal, there are no official gates or main entrances to the park, which is already densely populated, making the assessment of tourists and visitors influxes a challenging task.

## Material and methods

To fulfill this information gap, a sampling strategy was designed to collect direct and indirect data regarding MTB activity. During nearly two years, MTB has been surveyed using a TRAFx™ fixed counter logger on one of the most intensively used trails (Moinhos Trail), in order to characterize the number and seasonal presence of mountain bikers. In order to study the spatial distribution of this activity, we also collected data from GPSies.com, a sharing WebGIS platform that allows uploading, searching and collecting GPS tracks from all over the world. Collected GPS tracks were then converted into shape files and analyzed in a GIS project, using ESRI® ArcGIS™ 10.0 ArcInfo.

While counter loggers collect direct data counting the population of users that pass by it, GPSies.com and other web share services data represent only the bikers that want to share their tracks. Nevertheless, due to the large amount of collected tracks, this indirect method should be able at least to identify all trails and paths used in MTB rides.

## Results and analysis

### Counter logger

Counter results, from a total of 13815 hour of observation periods (from August 2010 to May 2012), have shown that

Sunday mornings are by far the busiest period for MTB rides, with average counts being twice of Saturdays (180 and 95 respectively) and 7 to 8 times more than regular working days. Maximum counts have reach 137/h, 317/day (May 2011) and 790/week (October 2011 – with a national holiday on a Wednesday), quite above the overall average numbers for the same periods. On average for the entire sampling period, 58.65 counts per day were registered.

This daily and weekly pattern is constant all year, with the pattern of seasonal differences similar to other open-air activities. Spring, summer and early fall months are more used than winter. Rain, wind and extreme temperatures are the environmental factors that seem to have more influence on this activity in Arrábida Natural Park.

### GPSies.com tracks

Search queries on GPSies.com were made on 29 May 2012 for each municipality within the park area, being restricted to a distance up to 25 km from it and just to MTB tracks. Each query returned the 250 newest tracks uploaded to this service, limiting the time window for each dataset. After the elimination of duplicates, the 750 GPS tracks downloaded (uploaded from 11<sup>th</sup> February to 28<sup>th</sup> May 2012), resulted in 338 individual tracks, 186 (55%) of which crossed the park limits.

The 186 tracks included in the analyzed dataset reached a total accumulated distance of 9530 Km, of which 49% were within the park area. Spatial analysis from GPSies.com tracks was carried out by overlaying a fishnet square grid of 25, 50 and 100m on the tracks dataset, in order to obtain the number of tracks per grid unit. Each result was then compared with the official road and paths network using the same method. Fishnet cell sizes were chosen to accommodate GPS spatial errors, which can vary up to 15/20 meters depending on atmospheric conditions, especially on tracks collected by assisted GPS cell and smartphones. As expected, results were more accurate on the smaller grid being the processing time the only inconvenient for this choice.

The spatial analysis has shown a non-random spatial distribution of MTB activity, highlighting four major findings: Moinhos Trail, where the counter logger was installed, is the most used trail of the Park; 44% of the analyzed tracks originate from, or go to, the surrounding municipalities on bike; 85% of the 25 m grid cells that are intersected by the analyzed tracks are within the official road and paths network; illegal trails and paths include the following situations: full protection areas, connections and shortcuts between regular trails and paths and private property trespassing.

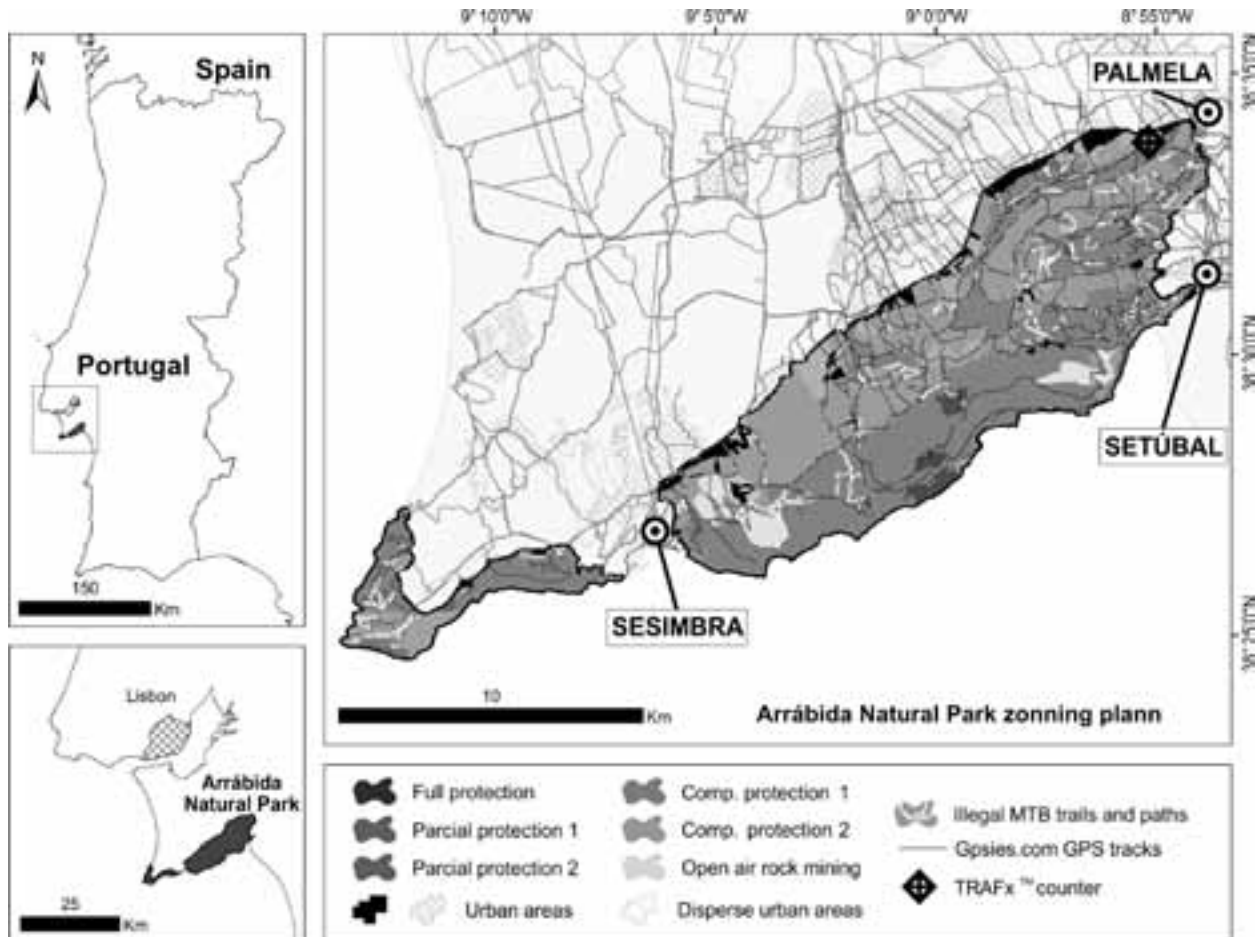


Figure 1. Arrábida Natural Park showing the zoning plan, trails and paths used by MTB riders. White lines represent MTB trails and paths that are not included in the official road and paths network, and that might configure illegal tracks.

## Conclusions

Final results of this study provides the park authority and other stakeholders with the first insights of the MTB activity within Arrábida Natural Park, setting up a reference condition for further monitoring and carrying capacity evaluation. The large number of users and their varied proveniences demonstrates the high attraction of Arrábida for its trails and paths. It also shows that most users prefer to ride the official trails and paths network, limiting the illegal use to specific areas and reduced number of bikers, suggesting that this problem could be solved with proper park patrols and education actions.

Further work should be made on GPS tracks web share services, in order to understand if these datasets can be used as a new monitoring source, or if these can be used to profile average bikers preferences, in order to provide to MTB users offers that respects conservation goals and constraints.

# Monitoring coastal uses of the Marine Reserve of La Reunion using aerial surveys, Reunion Island, France, West Indian Ocean

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## Introduction

Founded in 2007, the Marine Reserve of Reunion Island (RNMR) aims to preserve and add value to a fringing reef which has long suffered strong anthropogenic pressures. These reefs suffer from a massive coastal urbanization which has increased these last 25 years because of good climatic conditions and seaside assets. Overcrowding, strong coastal urbanization, discharge of agriculture pollutants and the lack of a suitable drainage system have worsened the situation. In addition to human pressures, natural factors of stress have also added to the damage of coral reefs (rise of sea temperature, ENSO, hurricanes, etc.) Accordingly, coral cover decreased from 55% in 2000 to 32% in 2007. In 2008, half of Reunionese reefs were considered as damaged (Ahamada et al., 2008).

In this context, managers of the RNMR have to face new issues: on the one hand they are supposed to ensure rational development of the fisheries and on the other hand, they have to make uses (whether recreational or non-recreational) compatible with the protection of marine biodiversity for a sustainable use of resources and activities in the Marine Protected Area (MPA). This requires building a comprehensive view of activities and ensuring a rational management of uses and tourism in the RNMR. Over the last decade, fifteen uses have been identified on this territory (Mirault, 2006) and new ones recently appeared (e.g. paddle). Few measures of coastal activity have been carried out (Mirault, 2006) but diagnostics were either sparse in time and space, or too labor intensive. Since then, no uses were sustainably monitored. In Reunion Island, aerial surveys are used in ecology to measure and monitor turtle populations since the 1990's (Jean et al., 2010). Because of the "instantaneous" dimension this tool brings, it is now more and more used in coastal uses monitoring and especially useful when dealing with strong densities of users (Smallwood et al., 2011).

## Method

From January to July 2010 and January to July 2011, fifteen uses including sunbathing, swimming, fishing and water sports were regularly monitored using aerial surveys and photos. 48 flights were planned over this period each year, and stratified by time (holidays, weekdays, week-end, and morning/afternoon). Data were entered into a Geographic Information Basis (GIB) incorporating a Geographic Information System (GIS) offering a range of spatial or temporal analysis tools. Results are twofold: data can be exploited either through the prism of science in assessing and spatializing anthropogenic pressures on reef environment, or

through a management prism in contributing to optimize management (e.g. surveillance, communication, awareness policies, etc.) and assessing governance effectiveness. In the reserve management plan 2012, managers determined 4 specific uses to focus on, depending on specific reasons. We also put the emphasis on these uses in this presentation:

- All fishing uses (boat fishing, traditional angling and spearfishing) because they are directly linked to resource sustainability issues and, for some, still rooted in tradition (e.g. traditional angling) and managers are responsible for their continuation.
- Coastal uses (e.g. swimming and sunbathing) and water sports because of the significant localized pressures they induce on the reef (Epstein et al., 2004).
- Scuba diving for its well-documented impact on coral reefs essentially by direct physical damage to the coral (Barker and Robert, 2004).
- Surfing is particularly at risk to shark attacks. The number of attacks suddenly increased in 2010 (6 in a year as against an average of 1.1 per year usually). The point here is to encompass spatial and temporal dynamics of these users in order to draw a map of shark risk.

## Results

General distribution of users within the reserve is heterogenic in time and space. From one year to another, maps and statistical results highlight a "differential activity" in time and space. Sites that consistently gather the most of sunbathers and swimmers are Hermitage, Saline North, Boucan-Canot and Etang-Salé: they account for 50% of users of the total coast users even though they represent only 8% of the coastline. Except for Boucan-Canot, sites where pressure is high were found to be near no-take zones (sanctuary zones of Ermitage, Saline and Etang-Salé). A finer scale analysis reveals the trends and dynamics of spatio-temporal distribution of each use. In order to highlight areas with management issues, spatial distribution uses was analyzed in regard to the representation degree of each use within each area. A typology of impact risks was built through the prism of uses per area (figure 1). High sampling resolution allowed us to analyze spatio-temporal dynamics for each use and each area.

The ways to assess governance effectiveness of Reunionese MPA with this protocol are numerous. For instance, it offers an overview of users' distribution in time and space, thus infringements as well, whether in no-take zone, or in non-fishing zones. Managers plan field surveys during which infringements are recorded and registered in a da-

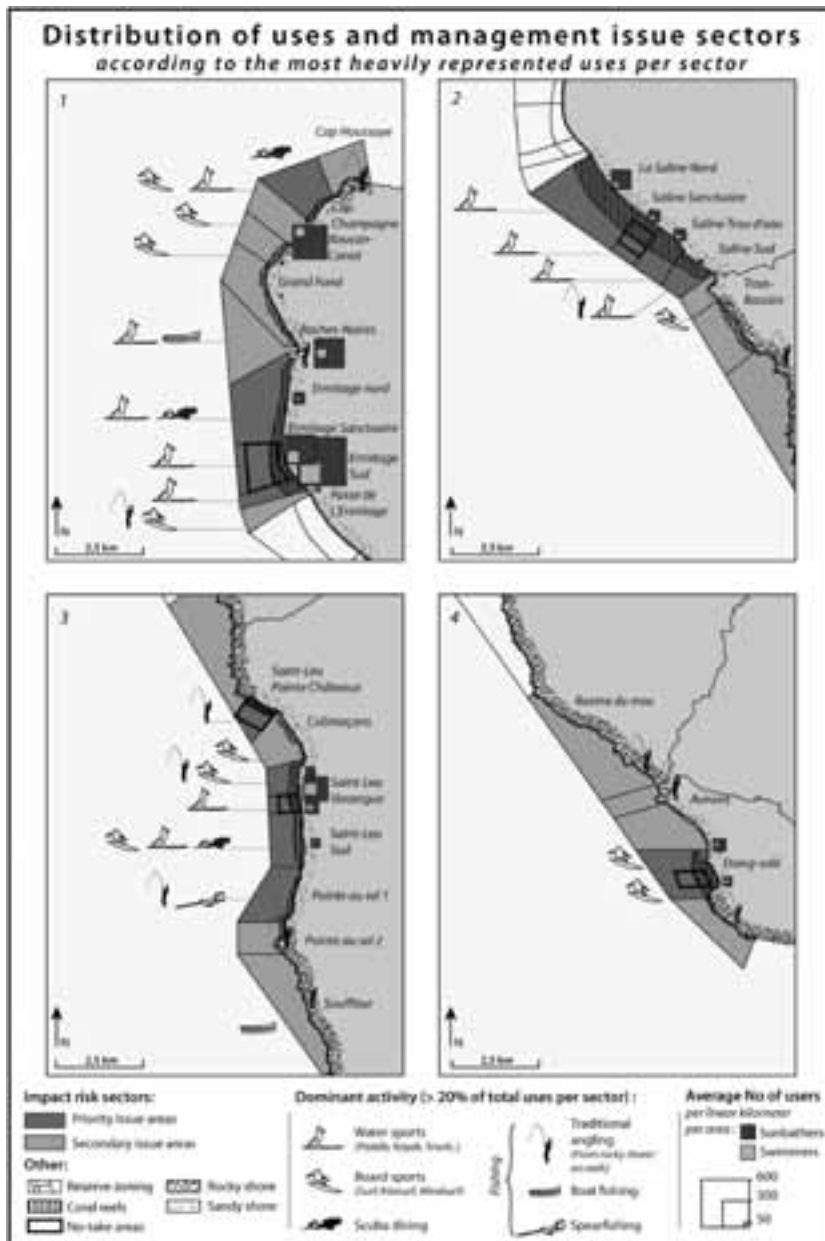


Figure 1. Mapping of uses spatial distribution and management issue areas in regard to the representation degree of each use per area.

tabase. Nevertheless, these observations are quite punctual and sparse in time and space. Moreover, the surveillance effort is focused on Ermitage-Saline area (68% of total surveys). All in all, 2010 and 2011's infringements, observed from the air, totaled 1,327 observations (70 % in

non-fishing zones, 24 % in no-take zones). Between 2010 and 2011, we noticed a decrease of infringements of 40 %. Similarly, a tendency to decrease (- 32 %) was also observable in management data, proving that both methods are complementary.

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# Recreational use and visitor motivations at Torfhaus visitor area in Harz National Park, Germany

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## Background

Profound knowledge about visitor numbers to a protected area, combined with those visitors' demographics and their recreational preferences, can be considered the most important baseline data in order to enable protected area administrations to manage visitor impacts and the quality of the recreational experience (Kajala et al. 2007; Eagles et al. 2002). In spite of this knowledge, visitor monitoring can be considered the stepchild of protected area management in Germany as the majority of its 14 national parks (and the other protected areas as well) lack sophisticated efforts to establish visitor management systems based on valid visitor numbers (see Burns et al. 2010).

Harz National Park in the Northern part of Germany is one of the country's most frequently visited parks and serves as a valid case for lacking visitor data. The Harz region has provided recreation opportunities for visitors since the advent of tourism. With the designation of a national park in 1991, about 10% (246 km<sup>2</sup>) of this forested low mountain range are now under strict protection. Due to a lack of accurate visitor counting procedures and due the geographical dispersion of ingress and egress points, the exact number of visitors to the park remains unclear, although the park estimates it to be between three and five million visitors per year.

In order to perpetuate visitor monitoring methods in the park, the Torfhaus visitor area was chosen for a case study. It is one of the park's tourism hot spots and is visited by an estimated 500,000+ visitors annually. Since 2009, a new visitor center has been serving about 160,000 visitors each year, creating an opportunity to inform visitors about the park's purpose and objectives. A target group analysis had not been carried out prior to the relocation of this visitor center.

## Objectives and research questions

Based on these considerations and to reflect management needs, a set of research questions was defined. These research questions address the visitor motivations to come to the area, the park's importance when making the decision to travel to the region, the overall number of visitors to the Torfhaus area, including the percentage of actual visitors to the park's interpretive infrastructure, and many more. The objective of the study was to evaluate the park's current on-site outreach strategy and to develop recommendations for improvement if necessary. This paper focuses on three of these important research questions:

- What are the main visitor motivations to visit the Torfhaus area in Harz NP?
- What role does the existence of Harz NP play in the visitors' decision to travel to the region?

- What are the primary recreational uses and visitor activities in the Torfhaus area?

The study's objective was to develop recommendations to the park's managers based on the findings on each of the research questions.

## Methods

As the set of research questions focuses on a variety of management issues associated with the Torfhaus visitor area, several different quantitative methods were selected depending on the specific research question. The methods include a manual vehicle count (number of cars, number of passengers, license plate for origin determination), three different quantitative survey instruments (one on general visitation and two on pre- and post-visitor experience), a visitor count in the visitor center and hidden observation in the exhibit to identify the time spent at each exhibit). The surveys were carried out on several sampling periods between July 2011 and February 2012, with the next sampling periods being planned in July and October 2012 in order to support continuous data collection.

## Results

The results presented here focus specifically on the research questions presented and on the quantitative general visitor survey. Within the first sampling period, a total of 774 visitors were interviewed at the Torfhaus parking lot, of which 338 were summer and 436 winter visitors. The overall visitation of the area does not really fluctuate over the year (except for the month of November, when visitation is at the lowest); it is rather dependent on current weather conditions in the region as the park's catchment area includes the Hamburg, Bremen and Hannover metropolitan areas within daytrip distance. The percentage of day visitors was 58.3% in the summer season compared to 71.6% during the winter. The average length of stay for overnight visitors was considerably longer during the summer (6.8 days) than during the snow season (3.8 days), while the average group size remained about the same (4.6 vs. 4.9 people per group). Foreign visitors made up for 10.7% of the overall visitors in the summer versus only 2.3% in the winter time.

96.8% of the visitors were aware that they were in a national park. For 12.4% and 34.9%, the park's existence played a very important or an important role, respectively, when making the decision to come to the region. Nevertheless, 94.8% of all visitors would still have come if the park did not exist. The results of these questions were combined in a cross table, identifying the total number of visitors to whom the parks existence was (very) important and who would not have come without the park existing. A total of

27 visitors or 3.5% of the sample were identified, who can be considered “core” or “true” national park visitors.

The visitors’ main activities and motivations showed an expected seasonal variability. During the summer (n = 335), stopping for the scenery (23.6%) was the most important reason for stopping at Torfhaus, followed by hiking (21.2%), dining (15.5%) and to make a rest stop (14.3%). 2.7% came for other outdoor activities than hiking. 2.4% stated they came specifically for the visitor center, another .9% specifically because of the national park.

During the winter season, 38.9% came for snow-related activities. Enjoying the scenery, to which the snow probably also contributed, was the main activity for 18.0% of the sample, followed again by dining (15.7%), hiking (6.9%) and again, using the location for a rest top (4.8%). 1.8% came for the visitor center, none specifically for the national park.

## Discussion

The Harz National Park’s visitors to the Torfhaus area show a high seasonal variability in regards to the main motives for their visit and their preferred activities. If snow is present in the wintertime, almost 40% of the visitors come for this special experience. In general, the presence of the national park only plays a minor role for the visit, also indicated by the low number of “true” national park visitors at this specific site. As the current exhibit in the visitor center is directed towards people with a rather keen interest in the national park, the park’s administration should reconsider whether the misalignment between the intended target group and the actual visitor needs to be addressed. The data strongly suggests that a more target-oriented approach could help to build a greater awareness about the national parks and its objectives.

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# Welsh seasonal habitat vulnerability mapping

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This paper presents a series of maps created using the methodology suggested in the report Welsh Seasonality Habitat Vulnerability Review. (Footprint Ecology / CCW 2010). The maps are intended to provide a tool for policy makers, planners and access managers highlighting areas of the countryside particularly sensitive to outdoor recreation; potentially guiding the location and provision of access infrastructure etc.

## Aims

The key aims of this mapping project have been to try and:

1. Create a resource that looks at the recreational mechanisms that impact on the natural environment rather than identifying and pigeonholing specific types of recreation.
2. Introduce a temporal dimension to recreation planning in the form of the seasonality of vulnerability.
3. Separate the risk of impact (the sensitivity of the feature) from the likelihood of it happening (the amount/type of recreation occurring).

## Method

Maps have been created to show the spatial distribution and degree of vulnerability of the natural environment to four main types of impact caused by recreation: damage, contamination, fire and disturbance. All terrestrial, freshwater and coastal habitats are included (excluding coastal habitats restricted to the sub-tidal and intertidal zones). Broad habitat types have largely been used, refined in some cases by use of National Vegetation Classification categories. The maps were developed using a 500m grid covering the entirety of Wales and containing 86,860 cells. Information from various spatial datasets was then summarised or extracted to allow comparative values to be allocated for each grid cell. The following maps were generated:

- **Damage:** A map for each season, plus an overall map for all seasons combined
- **Contamination:** One map for all seasons combined
- **Fire:** A map for each season, plus an overall map for all seasons combined
- **Disturbance:** A map for each season, plus an overall map for all seasons combined
- **All impacts combined:** A map for each season, plus an overall map for all seasons Combined

This resulted in a total of 21 maps. The steps used to generate these maps are set out below:

### Damage

For the purpose of this project, damage refers to direct damage to vegetation through wear, loss of vegetation cover to expose bare soil and loss/damage of soil through erosion. Damage occurs as a result of footfall and abrasion from

wheels. Each grid cell was given a score to indicate relative vulnerability of the habitats present to damage. The score was then adjusted for any sensitive soils or high aspect slopes (above 20 degrees) present. Twenty-degrees was chosen based on the information in the literature review.

### Contamination

Contamination refers to the impacts of nutrient enrichment, for example through dog fouling, and also littering. As with damage, each grid cell was given a score to indicate relative vulnerability of the habitats present to contamination. The expert-derived scores for contamination showed no variation with season, and therefore a single map was produced for contamination.

### Fire

Fire refers to the impact of fires caused either deliberately by members of the public or accidentally (e.g. sparks from barbecues etc.). As for both damage and contamination, each grid cell was given a score to indicate relative vulnerability of the habitats present to fire. A further score was also given to the soil type found in each square. The seasonal variation was refined by historical Fire Severity records that indicate the likelihood of weather conditions that increase the risk of fire through the year.

### Disturbance

Disturbance refers to impact on the behaviour or survival of an animal as a result of recreational activity. The method used focuses on mapping the presence/absence of relevant species at the relevant times of year. Lists of species were circulated to a range of species experts and comparative scores for the vulnerability of the species in a given season derived. Distribution data for these species were extracted from the dataset of protected species records provided by CCW.

### All Impacts Combined

A set of maps was also produced that highlight the overall score of each impact type by summarising the scores calculated separately for each cell.

## Testing

To ensure that the maps are correct and delivered in a way that suits their target audience, they are currently being piloted by the three Welsh National Park Authorities. The National Parks were selected as pilot areas as the Authorities operate at the optimum scale of recreation planning in terms of the predicted use of the maps. The feedback from these pilots will be used to:

1. Test the methodology by checking whether the maps correlate with observations and evidence gathered on the ground.
2. If changes are required; help define a framework



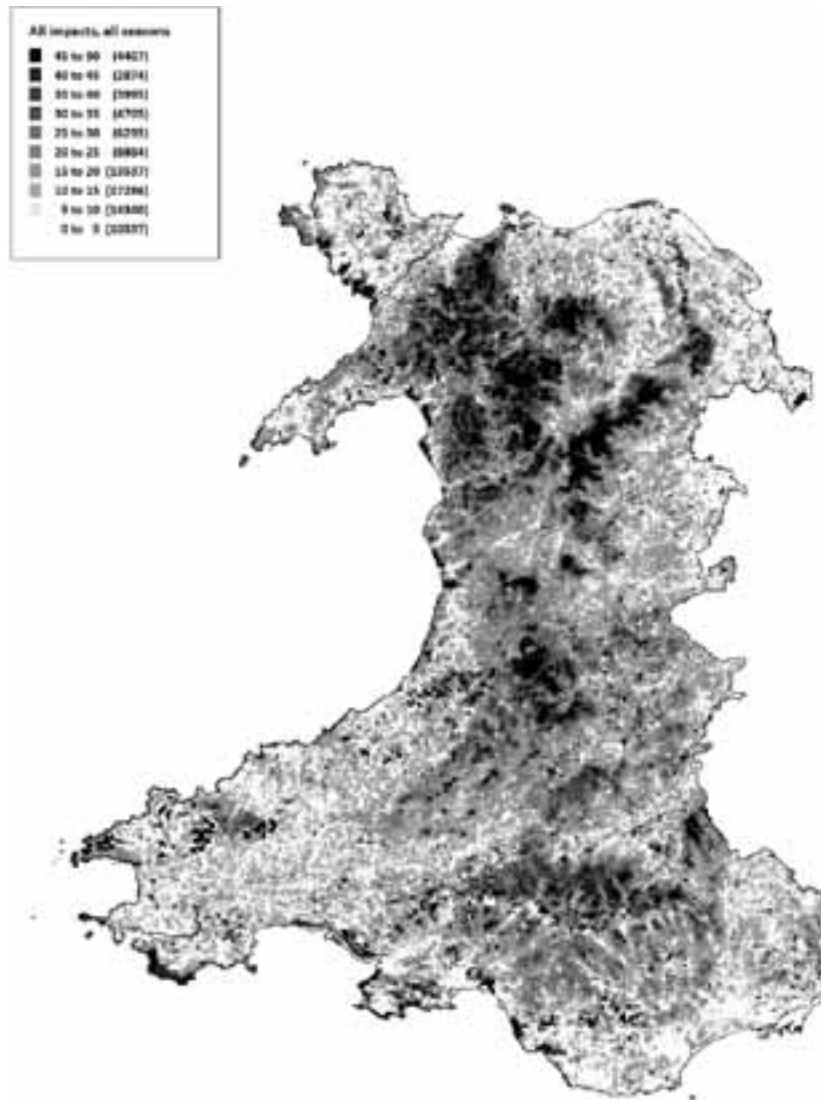


Figure 1. Wales Seasonal Habitat Vulnerability Map – All Impacts, All Seasons

through which to make them.

3. Explore the most appropriate format for the end product.

Early feedback on the maps has outlined possible refinements to the data used and considerations about the practical applications of the maps.

## Conclusion

The future use of the maps will depend on the results of the testing. However, early responses to the project have been positive. Some issues have been flagged up about the scale the maps are effective at. It is clear that the maps, in their current form, can not be used at a micro level. It is also clear

that the maps, in their current form, cannot be overlaid. The maps need to be reviewed independently of each other, therefore, whatever interface is chosen to host the maps will have to be able to deliver this.

Having said that; very positive dialog has begun with Wales Activity Mapping ([www.walesactivitymapping.org.uk](http://www.walesactivitymapping.org.uk)) about using their website as an interface for the maps. They hold spatial data about participation rates in outdoor recreation that could, in theory, be used in combination with the vulnerability maps to give an array of useful information to landscape and recreation planners and help maximise the use of the natural environment in Wales whilst protecting it for the future.

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# Monitoring and management of bush camp grounds in an Australian national park

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The Australian state of Victoria has a large and varied protected area network covering 3.96 million hectares. In line with global trends, visitation to Victoria's parks has increased significantly over the past ten years, to 88.5 million visits in 2010. The planning and management of Victoria's parks aims to provide equitable access for a range of recreation and tourism activities, and to minimise the impact of these activities on natural and cultural values (Department of Natural Resource and Environment 2002). However, Victoria currently has no structured approach to management of visitor impacts in protected areas and very little monitoring of impacts is undertaken. The organisation responsible, Parks Victoria, has recently endeavoured to remedy this through the development of a coordinated state-wide approach for monitoring and managing recreation and visitor impacts.

Parks Victoria developed a framework for sustainable, adaptive management of the ecological impacts of tourism and recreation activities in the Parks Victoria Estate. The framework seeks to identify and prioritize sites and impacts, design monitoring plans, capture data and inform management actions. The framework was primarily derived from the Levels of Acceptable Change planning framework (Stankey et al. 1985), Visitor Research and Protection framework (Hoff and Lime 1997) and the Integrated Framework for Developing Ecological Indicators of Visitor Use in Protected Areas (Castley et al. 2009) and designed to utilise data already available for the Parks Victoria Estate.

The Grampians National Park was used as a case study for implementation of the visitor impact framework. The Grampians is one of the most highly visited parks in the state and is particularly popular as a camping destination. Campgrounds in the Grampians vary from small, wilderness, non serviced camps through to large, organised camping areas and commercial camping operations. The large number of bush campsites in the park was identified as unsustainable and has resulted in issues such as track proliferation and vegetation loss and damage. Bush campsites have generally been developed by the user with minimal planning strategies or environmental or cultural consideration involved in their placement, with sites mostly created prior to the creation of the national park in 1984. No monitoring of bush camps had been undertaken and the location of the camps was not recorded. Therefore, a census style approach with condition classes was employed to allow for a rapid and thorough inventory of all bush camp sites. Once sites were located, categorical data was recorded on the inventory and impact attributes listed in Table 1.

A total of 273 bush camps was located during the survey, with a relatively equal distribution between small (<25m<sup>2</sup>), medium (<100m<sup>2</sup>) and large (>100m<sup>2</sup>) sites. The management decision in response to the monitoring data was

to close and rehabilitate some sites. Sites were selected for closure if they were located in non-compliant management zones or had low site impact (non active sites, with high vegetation cover and small size). This was to be an adaptive management approach with a number of closure techniques employed and ongoing monitoring to determine compliance to closure and rehabilitation success.

Ongoing monitoring and management of retained sites was needed to assess camp site footprint and ensure impacts did not increase with the changes to site availability due to closures. In order to build an effective and functional monitoring regime, a structured decision making process was used. Structured decision making (SDM) is a decision framework that is increasing in popularity for natural resource management applications (Lyons et al. 2008). The process involves three basic steps 1) identifying objectives, 2) a set of potential actions from which to choose, 3) some expectation of the consequences of consequences related to each potential action, given the objectives. When determining suitable monitoring of visitor impacts, there is a long list of issues and questions that should be addressed (Cole 1989). SDM gives structured method for developing answers to these questions, on a site by site basis, given explicit problem statements and knowledge of the specifics of the system in question and management options available. It is particularly useful for this application as it allows for a realistic, site based assessment of management alternatives and defensible and transparent decisions. This process allows for identification of targeted monitoring methods that are tailored to inform management decisions.

For the Grampians National Parks example, the SDM approach identified the fundamental objectives as continuing to providing a bush camping experience within the park and ensuring that this experience was sustainable. The performance measures for ensuring a sustainable camping experience included minimising tree damage, informal trails, evidence of human waste and maintaining site size, signifying the need for a multiple indicator approach to monitoring. As information on the scale of any change in condition will be needed to trigger management action, and evidence of such change required to elicit ongoing funding support, quantitative measures are needed.

In this case, the application of a visitor impact framework was successful in identifying and prioritising sites and impacts and directing monitoring efforts. However, once the problems had been identified, a SDM approach proved to be an effective method for making site specific decisions about visitor management and identifying suitable monitoring methodologies. In places like Victoria where management decisions are often determined on a park by park basis, SDM may prove a valuable tool for visitor impact management.

Table 1. Parameters measured at bush camp sites in the Grampians NP.

Inventory parameters	Impact parameters
Forest Type	Footprint (m <sup>2</sup> )
Forest Size	Ground cover impact (%)
Access method	Overall impact (determined by combination of footprint and ground cover)
Soil type	
Distance to water body	Fire Scars
User Group	Fire places

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# A conceptual model for assessing wildlife vulnerability to human activity at visitor sites in Svalbard

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## Introduction

Increasing human activity in Arctic areas, call for awareness to avoid negative effects. There is an apparent lack of knowledge related to effects of human activity on arctic wildlife (Hagen et al 2012 a, b). Protection of Arctic wilderness combined with politically wanted human activity in Svalbard (our study area) is challenging. The precautionary principle is often central in managing biodiversity and protected area, also stated in the Svalbard Environmental Protection Act (2001). When several societal interests are present, there is a risk that strict management precautions, overruling stakeholder interests or local input, could generate conflicts and undermine the legitimacy of management decisions (Stern 2008). Managing authorities need legitimacy and accept for their decisions, underpinning the need for evidence-based knowledge (see Hagen et al 2012 a).

Wildlife species react very differently towards human activity. Although some studies manage to link physiological responses to reproductive responses (e.g. Beale 2007), there is not necessarily an immediate link between responses at local level to effects at population level for species in general. From an ecological point of view disturbance should be defined as negative when it has effects at the population level (Vistad et al. 2008). There are few studies on species-specific responses to different types of human activity from Svalbard (Vistad et al. 2008). Nonetheless, using available literature and researcher interviews, it is possible to make a rough grading of the likelihood of negative responses to disturbance for different groups of birds and mammals (Hagen et al 2012 b).

We have developed a conceptual model assessing wildlife site specific vulnerability to human activity based on 1) a large review of disturbance studies, categorizing groups of species to likelihood of negative responses to human activity, and 2) the Red List Status of the species. Vulnerable hotspot habitats or habitats features are also included in the model.

## Vulnerability assessment

We categorized species of birds and mammals of Svalbard in three groups related to their likelihood for reduced reproduction when disturbed, based on a broad literature review (e.g. Vistad et al. 2008), and the three categories *Unlikely*, *Possible* and *Very likely* where weighted with scores 2, 4 and 8. The species were also given weight related to Red List status as a measure on “management priority” given the scores; LC=1, NT=2, VU=3 and EN=4. The two scores are multiplied, giving a range of 2–32 in specie specific vulnerability. Additionally 10 hotspot habitats (e.g. seabird colonies,

freshwater ponds and wetlands) are given weight based on the function of the habitat (breeding=1, foraging area=0.5), and the likelihood of finding different species in the habitat. Hotspot habitats are further weighted by the species Red List status as a measure for likelihood of presence; LC species = 0.25 and NT species = 0.1. Species strongly associated with the habitat is weighted 0.5 independent of their Red List status. The input data in the assessment is field observations at each site including present and breeding species and hotspot habitats. In the model estimate presence of non-breeding species is given weight 0.75 while breeding species are given weight 1. The sites vulnerability is the summarized score of observed species and presence of hotspot habitats (e.g. table 1).

## Results

Our model assessing wildlife vulnerability is illustrated for one landing site (Signehamna) in Table 1.

We assessed sites-specific wildlife vulnerability at 32 land sites used by coast cruise traffic in Svalbard. The preliminary results show that our vulnerability estimates ranged from 0 to 176 on visited landing sites. The assessment revealed that only 4 sites (13 %) had very high potential for negative effects, while most land sites (56 %) had low conflict level.

## Discussion and implications

Our vulnerability assessment was developed with two aims; 1) The registration of input data was simplified to make the site-specific registration independent of expert field workers, while 2) still being good enough to capture and differentiate between robust and vulnerable sites.

We have developed a conceptual framework assessing wildlife site specific vulnerability to human activity outside settlements, which can be used as a tool and an evidence based fundament to give priority and focus to the most vulnerable sites with regard to wildlife. Using this approach the management authorities may differentiate regulations at the level of sites rather than large landscapes (as often is the practice today). The model is intuitively understandable and may also contribute to higher societal acceptance of regulations and restrictions at visitor sites when needed. Consistent assessments and evidence based management practice will be the future demand. This conceptual model is one step ahead towards a greater understanding of human impact.

Table I. The table shows how the vulnerability score is calculated for each visitor site (here Signehamna)

Landing site	Signehamna						
	Score vulnerability* "management priority"	Species observations	Score (weight)	Hotspot habitat	Score vulnerability* "management priority"	Observation hotspot habitat	Score (weight)
Red-throated diver	8	1	8	Solitary lake/pond	13.4	1	13.4
Barnacle goose	8	1	8	Freshwater breeding islet	12	1	12
Common eider	8	0.75	6	Easily accessible nesting cliff	3.6	1	3.6
Purple sandpiper	4	0.75	3				
Brunnich's guillemot	8	1	8				
Black guillemot	4	1	4				
Arctic tern	8	0.75	6				
Arctic skua	4	1	4				
Blacklegged kittiwake	8	1	8				
Glaucous gull	8	0.75	6				
SUBTOTAL SPECIES OBS.			61	SUBTOTAL HOTSPOT HABITAT			29
<b>Total vulnerability score</b>							<b>90</b>

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# How effective are planned buffer zones in reducing recreation impacts on an urban national park? – A combined visual discrete choice and agent-based modeling approach

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## Introduction

New housing developments for ten thousands of new local residents in the 22<sup>nd</sup> district of Vienna will increase the recreation use pressure on the nearby UNESCO Untere Lobau Biosphere Reserve and the IUCN-category II Donau-Auen National Park (Figure 1). These areas are traditional, intensively used, recreational settings of high ecological value as documented by more than 600,000 visits annually (Arnberger, 2006). The increasing high recreation use pressure will negatively impact the park's natural resources and the quality of the recreational experience because of crowding and user conflicts (Arnberger, et al., 2010).

This study, that was co-financed by the Austrian Man & Biosphere Program (ÖAW-MAB), investigated planning and management options regarding their capability to reduce the increasing visitor pressure on these already heavily used protected areas. The research project aims in identifying the most effective design of planned buffer zones between settlement and protected areas.

## Methods

This project relied on several methodological approaches. Stakeholders from several administration bodies and scientists from various disciplines participated in the project. Area visitors' preferences and behaviors were included in the modeling approach. In a first step, buffer zone scenarios were defined. In a second step, these scenarios were simulated regarding their effectiveness in reducing recreation impacts on the protected areas.

### *Definition of recreational scenarios*

The main question was: How can the existing large-scale agrarian-dominated areas surrounding the protected area transformed into attractive recreational landscapes? Four basis scenarios were developed in stakeholder workshops. These scenarios included a bundle of landscape design, land use, traffic and recreational infrastructure measures. In addition, measures to restore the ecological integrity of the area were included in the scenario definition.



Figure 1. Study area in the 22<sup>nd</sup> Viennese district: Untere Lobau Biosphere Reserve and Donau-Auen National Park.

### Trail preferences

Modeling visitors' behavior requires a sound knowledge about their landscape, recreational infrastructure and social use preferences. An image-based conjoint-choice survey asked the influence of various landscape types (ranging from natural to built environments), recreational infrastructure facilities and trail use conditions (trail user numbers, visitor activities) on protected area visitors' trail use intentions for specific leisure activities such as bicycling (N = 520).

Visitor evaluations were modeled as a function of the physical and social trail factors. Such approaches are rooted in the traditional microeconomic theory of consumer behavior and preference theory and have been applied to study preferences and choice behavior for a range of recreation and tourism related issues (Arnberger, et al., 2010; Louviere, Hensher and Swait, 2000; Reichhart and Arnberger, 2010).

### Agent-based modeling

An agent-based model tested the scenarios regarding their capability to reduce visitor use pressure. The definition of agents and their decision making algorithms included several approaches. Besides trail preference data, behavioral and individual data, derived from visitor counts or on-site visitor surveys completed the definition of the agent types. Agents were defined as activity types such as bicyclists or dog walkers. GIS-data of the protected area itself as well as of the surrounding existing and planned buffer areas served as spatial input data and included vegetation structures, land uses, water bodies, access points and recreational

infrastructures such as trail types. Agent-based simulations relied on the MASOOR simulation platform (Jochem, Marwik, Pouwels, and Pitt, 2008). Setting the input parameters was partly based on a previous agent-based model carried out in the study area (Taczanowska, Arnberger, and Muhar, 2008).

### Results

The image-based survey found that visitors' trail use intentions were influenced by many physical and social trail factors. The role of these trail factors on visitor intentions depended on specific leisure activities: dog walking, for example, required different site factors than bicycling. Agent-based simulations indicated that the planned buffer zones can only absorb about 30% of the recreation use pressure. The use pressure on the protected areas will drastically increase. Therefore, additional green spaces in the urban-sprawl region are required to further reduce recreational use pressure on the protected areas.

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# Horse riding in protected areas: And the dung?

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## Introduction

*Serra do Cipó* National Park has undergone a major management challenge which will refine horse riding regulations for visitors of the park. The Brazilian Government recently launched a document entitled Guidelines for visitation in protected areas (Brasil, 2006) which dictates certain rules for recreation ecology activities. However, there are relevant issues related to the introduction of exotic species in protected areas that are inconsistent to the Brazilian law.

The presence of domestic animals in protected areas can cause several environmental impacts including the entry of alien species resulting in biological contamination. Wittenberg and Cock (2001) suggests that the entry of invasive species in protected areas occurs in numerous ways. In many situations, it is not intentional.

Pathogens can be introduced via the clothing and shoes of tourists; seeds infiltrate through equipment, animals and vehicles; and of course wind and water provide a natural means of dispersal. In addition to these various forms of invasive seed dispersal, horses have been highlighted as a means of spread, due to their capacity to transport a large quantity of seed in their feces (Newsome, Smith & Moore, 2008). Amongst the problems relating to the presence of horses in the *Serra do Cipó* National Park, Ribeiro (2005) reports soil erosion, contamination through feces and social conflict. The invasive alien plant species that have been identified include: braquiária (*Brachiaria decumbens*), braquiário (*Brachiaria brizantha*), fat-grass (*Melinis minutiflora*), grass jaraguá (*Hyparrhenia rufa*) and grass andropogon (*Andropogon guayanus*).

## Methods

This research aimed to investigate whether a relationship exists between the use of horses and biological contamination of exotic grasses by horses' dung, in the *Serra do Cipó* National Park (Minas Gerais State, Southeast of Brazil). Therefore, we selected two trails of the park which present significant differences in terms of topography and land use history. Farofa trail is mostly used for tourism and Capão trail mainly use for monitoring and fire control.

The method was defined based on the work of Campbell and Gibson (2001) and adapted to local conditions. From each of the tracks, equine dung and soil samples in two seasons: autumn (dry) and summer (rainy), were collected. The samples were divided into two experiments, one installed in situ and another at the Laboratory (Figure 1). We have prepared 20 fecal samples from horses brought from each of the two tracks in every season; each sample contained a total volume of 400 ml. These samples were used in an experiment set within the *Serra do Cipo* National Park.

An employee of the Park was responsible for observation and control of germination. The germinated seeds in the Laboratory were counted and followed during growth.

We also conducted an in situ study in order to verify the presence of exotic grasses and native plants in areas served by the two trails.

In this study, four points, which had as reference the center of the trails, were defined for sampling: center, edge, transition and interior. We used a quadrant of 50 cm X 50 cm divided into 25 subdivisions, to count the presence of the exotic grasses and native plants. Statistical analysis was performed using SAS software, version 9.1.3.

## Results

The results of this research reveal that there has been an increase in the amount of exotic grasses in the trail *Farofa* when compared with the trail *Capão* ( $\chi^2 = 136.2003$ ;  $p < 0.0001$ ). On the trail *Farofa*, significant difference was found for the presence of exotic grasses among the points ( $\chi^2 = 31.3654$ ;  $p < 0.0001$ ). The center point was statistically different.

On the trail of *Capão* no difference among the points was assessed for exotic grasses. The native species were found more frequently on the trail of the *Capão* ( $\chi^2 = 64.0424$ ;  $p < 0.0001$ ).

There was a statistical difference between the center points on both trails for native species. The results obtained from soil samples that were in the controlled experiment in the laboratory, revealed that there is no difference in germination between the trails. Dung samples, however, identified differences between the tracks ( $\chi^2 = 7.3657$ ;  $p = 0.0066$ ), and there is a greater germination in the trail of *Farofa*.

A significant difference in germination between the periods of autumn and summer was found both in the dung samples ( $\chi^2 = 24.7570$ ;  $p < 0.0001$ ) and in the soil samples ( $\chi^2 = 5.0128$ ;  $p = 0.0252$ ). There was no germination in the experiment installed in situ.

## Conclusions

One hypothesis of this research was that the presence of exotic grasses would be greater in the area covered by the trail of *Farofa*, where the recreational activity of horse hire by visitors is greater. It was possible to diagnose a statistical difference in the presence of exotic grasses in the area covered by this trail.

It has also been noted that there is greater germination of seeds in the faeces originating from the path of *Farofa*. However, due to the varied use of this region in the past, it is not an absolute certainty that the contamination was caused solely by the presence of these horses.

One reason for the difference in germination of seeds in the soil material and in the feces collected on the trails between the two seasons lies in observing and evaluating plant phenology. In these ecosystems, the exotic grasses have a reproductive period in the autumn – when seeds are released into the environment.





Figure 1. Experiment of germination with fecal material collect ant the park was conducted at the Laboratory and in the field during autumn and summer.

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# A research agenda for adventure racing events that take place in natural settings and protected areas

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This paper refers to adventure racing which occurs in protected areas and research questions arising from this. Adventure racing generally comprises a combination of outdoor activities such as rogaining/orienteering, mountain biking, running, abseiling, rock climbing and canoe (white water) racing. Adventure races typically extend over long distances and take place over a number of days. Participants are usually required to master a range of – outdoor activities and also manage the transport of food, water and equipment. Contestants are at risk of illness and injury as they compete in unfamiliar and isolated areas and may be required to perform with minimal sleep in multiple day events (see Kay and Laberge, 2002). Adventure racing is well established in New Zealand, USA, Australia, Morocco, Argentina, Borneo, and Fiji. Events that take place in these countries range in size and sometimes involve thousands of people including support crew, spectators and organizers, sometimes media and film crews and are an increasingly profitable commercial enterprise.

Newsome and Lacroix (2011) and Newsome et al. (2011), in their recent study of adventure racing and mountain biking events in Australia, have demonstrated that adventure racing is increasing in popularity. Their work also demonstrates that these events frequently involve the use of areas reserved for nature conservation. Following on, event organizers are increasingly targeting areas reserved for nature conservation and (presumably because of perceived social and economic benefits) protected area managers are granting the approval for these events.

Whilst there is a dearth of research on specific impacts there is plenty of information about the impacts of related or component activities. Newsome et al. (2011) document the potential impacts arising from a plethora of action based activities, such as running, mountain biking and field camping, biophysical effects include soil erosion, soil compaction, addition of nutrients and microbes including from human waste, creation of informal/social trails, exposure of roots, rocks and substrate and increased muddiness of wet and compacted trail segments (eg. Buckley, 2004; Turton, 2005; Mende and Newsome, 2006; Randall and Newsome, 2008; Pickering et al., 2010a). Potential damage to vegetation arising from trampling includes a reduction in height, cover and diversity of vegetation, loss of species sensitive to trampling and increase in species resistant to trampling including weeds (Turton, 2005; Mende and Newsome, 2006; Randall and Newsome, 2008; Hill and Pickering, 2009; Pickering and Growcock, 2009).

The biophysical impacts of adventure racing will vary with the type(s) of activity involved, when and where the race occurs, the number of people involved and the behavior of organisers, participants and spectators. Where compliance with codes of conduct/minimum impact codes is

limited, such as in the case of deposition of human waste, littering and in the creation of short cuts or when spectators move off trails, damage is more likely (Turton, 2005; Bridle et al., 2007; Littlefair and Buckley, 2008; Growcock and Pickering, 2011). Events that take place during wet conditions are likely to result in increased soil erosion and damage (eg Liddle, 1997). The severity of impacts from adventure racing will vary depending on where they are held. Unfortunately, impacts of adventure racing are likely to be greater in Australia than those in Europe and North America because of Australia's unique evolutionary history, fragile soils and sensitive vegetation (Newsome et al., 2002; Pickering et al., 2010a). For example, the potential spread of pathogens, such as fungal spores and water moulds on clothing, shoes and tyres is a particular problem in Australia (Buckley et al., 2004; Turton, 2005; Pickering and Hill, 2007).

A key question is the acceptability of any impacts that arise as a result of an adventure/sporting event that takes place in a protected area. There are a range of frameworks for decision making that might help to determine acceptability, Limits of Acceptable Change (LAC) is one of these (Stankey et al. 1985). This is not the place to interrogate individual frameworks, rather we wish to open up broad questions about how acceptability might be determined. As an approach to deciding upon the acceptability of impacts an LAC framework might be employed to assist in decision making in regard to how much activity might be allowed and what actions are required. With respect to biophysical effects, indicators could include: the occurrence of litter, damage to vegetation, soil erosion, trail degradation, development of informal trails (trails not sanctioned by management) and disturbance to wildlife. One problem will lie in deciding the scale and spatial extent of indicator measurement. If events are confined to trails to what extent does measurement of off-trail impacts need to be considered? It might also be prudent to monitor adjacent trail condition if large numbers of spectators are involved with the event.

Some events will/might have a cross-country component that would pose additional challenges in monitoring biophysical condition. In such cases it may be necessary to collect baseline data and place permanently marked quadrats that are designed to measure damage to soils and trampling of vegetation. If it is a dispersed activity as in the case of regaining/orienteering it may be necessary to have a very large sample area in order to detect potential damage.

Beyond the question of measuring impacts and determining the limits of acceptable change, research must be undertaken into the management of these events. Adventure-racing events are a global phenomenon. Although the environmental, social and cultural settings for the adventure-racing events differ across place, there is value

in understanding how adventure-racing events have been approached and managed elsewhere as this information can be used to inform local approaches and practices. Yet there is a lack of information about how the management of adventure racing events in protected areas is being approached, and what the strengths and limitations of various approaches are.

To this end (and to the benefit of all those who are faced with the challenge of managing events in protected areas) we are currently undertaking an investigation into the how adventure-racing events are being managed around the world. We are paying particular attention to the policy and legislative frameworks in place, how these have changed over time to address the advent of these activities, and

the various challenges of managing adventure racing events in protected areas. We are interested in collecting any information about the nature and scale of events in different locations, the processes by which event organizers have to apply for permission in different areas, what criteria protected area managers take into account when deciding whether or not to grant permission for an event, and whether monitoring programs are put in place as part of an environmental management plan for the events?

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# Colourful recreation in green: Review of research on immigrants, greenspace and society

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## Introduction

In various Northwest European countries immigrants seem to be under-represented in the recreational use of greenspace. Moreover, a 'whiteness' of staff of nature conservation organisations have been noted. As immigrant populations continue to grow, governments and nature conservation organizations in various West European countries start to recognize that immigrants' recreational use and perceptions of greenspace are relevant for nature policy and management. Correspondingly, the number of studies on immigrants' or ethnic minorities' use and perceptions of nature is increasing. However, research is still limited and almost exclusively nationally oriented. This review aims to provide an overview of concepts and approaches used in Northwest European research on immigrants' perceptions and recreational use of greenspace and societal aspects of migration and greenspace, and to discuss knowledge gaps and identify promising research directions.

Included in the review is both peer-reviewed research and semi-scientific research published between 1985 and 2010 (for an overview of all publications included, see Kloek et al., forthcoming). Four strategies have been used to search publications on greenspace, immigration and society: 1) searching scientific databases, 2) searching websites of nature organisations; 3) contacting five scientists from four countries; and 4) tracking references in found literature. The conceptualisation of greenspace includes both urban and non-urban green, from natural and semi-natural landscapes to the countryside and urban parks. Both studies on 'immigrants' and on 'ethnic minorities' are included in this review.

## Concepts and approaches Used

Three overarching themes can be distinguished in Northwest European studies on immigrants, greenspace and society (see Table 1). Within these themes various approaches exist. The first theme under which many studies on immigration and greenspace can be grouped is *recreational use of greenspace*. Three main conceptual approaches exist within this theme. Studies on 'recreational behaviour' focus on preferences for specific recreational activities and motives for recreation. In order to explain differences in recreational behaviour, a categorisation into socio-economic and ethnic-cultural factors is used. The approach of 'social inclusion' is concerned with providing individuals equal opportunities to participate in outdoor recreation. It mainly addresses frequency of recreation and perceived barriers to recreational use of greenspace. In the third approach, 'access the greenspace', GIS programs including data on demographics and the distribution of greenspace are com-

bined to describe the access to greenspace by immigrants.

The second major theme in literature on immigration and greenspace is *perceptions of greenspace*. Under this theme two approaches can be distinguished. The 'images of nature and landscape preferences' approach studies the perception and appreciation of nature and environment on a cognitive, normative and expressive dimension. Based on these dimensions, various images of nature are distinguished, such as the wilderness and the functional image. In studies into 'embodied experiences of greenspace' the sensory, emotions and affects, (childhood) memories and place attachment play an important role.

The last major theme in literature is *social aspects of migration and greenspace*. Three approaches fall under this theme. Studies on 'national identity and rural racism' focus on representations of the countryside related to national identity and ways in which these socially constructed imaginings promote the 'othering' of immigrants. They also address issues of belonging and attachment to the countryside and point to exclusionary practices and rural racism. The approach 'interculturalisation of nature organisations' focuses on evaluating the outreach of nature organisations to immigrants and distinguishing challenges and key factors for success. The last approach, 'social integration', evaluates the contribution of greenspace to social interaction, social cohesion and social integration among immigrants and natives.

## Knowledge gaps and promising research directions

Several knowledge gaps arise from this review. First, research has mostly been nationally oriented, empirically but also conceptually. The number of studies carried out strongly differ per country (see Table 1), with most studies being published in the UK and the Netherlands. Also the used approaches vary between countries. For example, 'national identity and rural racism' is only studied in the UK, while the 'images of nature' approach is especially used in the Netherlands. Borders seem difficult to cross: learning processes and cooperation of scholars across approaches and countries are scarce. To ensure a more consistent use and development of concepts and approaches, more cooperation and exchange between scientists at an international level is needed.

Furthermore, a proper and careful reflection of the diversity of immigrant perspectives is lacking. Executed studies tend to ignore in-group heterogeneity and overestimate differences between groups, for example by focusing on aggregated groups. A broader ethical discussion is needed including considerations on how immigrant perspectives are

Table 1. Themes and research approaches per country. Some studies cover more than one research approach.

Abbreviations: RB = Recreational behaviour; SI = Social inclusion; AtG = Access to greenspace; INLP = Images of nature and landscape preferences; EE = Embodied experiences of greenspace; NIR = National identity and rural racism; INO = Interculturalisation of nature organisations; Sit = Social integration.

Country	Number of studies	Recreational use of greenspace			Perceptions of greenspace		Social aspects of migration and greenspace		
		RB	SI	AtG	INLP	EE	NIR	INO	Sit
Belgium	-	-	-	-	-	-	-	-	-
Denmark	2	2	-	-	1	-	-	-	-
France	-	-	-	-	-	-	-	-	-
Germany	4	2	-	-	2	-	-	1	1
Netherlands	31	18	-	-	10	2	-	2	6
Norway	1	1	-	-	-	-	-	-	-
Sweden	1	-	1	-	-	-	-	-	-
Switzerland	1	-	-	1	-	-	-	-	-
United Kingdom	65	6	14	3	5	11	26	13	1
Total	105	29	15	4	18	13	26	16	8

reflected.

Lastly, links between themes, such as between recreational use and perceptions of greenspace, have not been properly researched. Moreover, many of the described studies lack an appropriate theoretical basis. Theoretical frameworks could help linking use and perceptions of greenspace and strengthening explaining factors.

To study immigrants' recreational use of greenspace more in-depth, we propose to use the concept *identity-in-context* as a theoretical starting point. Recreation is a realm in which people have, to a certain extent, freedom in time and choice. It therefore provides good opportunities to express and establish identities. People have various identities, ranging from social identities such as gender and ethnicity to personal identities. Which identity or cluster of identity is activated, is situationally dependent. For example, people can shift their ethnic affiliation from one ethnic group to another depending on the context. Activated identities are intertwined with ideas on which outdoor recreation behaviours are considered fun or appropriate and why. As

*identity-in-context* is not necessarily nationally oriented; we argue that it can be a good starting point to build a comprehensive theoretical framework for the greenspace–immigration–society interface which enables and stimulates international cooperation of researchers and a crossing of the borders.

# Exploring recreation pattern differences among Taiwanese Hoklos and Hakkas and Anglo-Americans

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## Introduction

Comparative studies across different cultures are one of the emerging research trends in forest recreation. A review of literature showed major differences exist between eastern and western cultures. Previously cross-cultural research mainly focused on comparisons between nations. Research comparing cultural/ethnic groups inter-culturally was extremely rare in the literature (Li et al. 2007). Exploring differences between cultural/ethnic groups fosters knowledge from cultural anthropology to recreation studies (Chick et al. 2007). We contend that if recreation differences were found between nations, then those differences derive from differences in culture. Understanding visitors culturally may assist managers in providing niche recreation management and achieving customer satisfaction (Burns and Graefe 2005; Reisinger and Tuner 2003). Therefore, the purpose of this study was to examine the socio-demographics, activities, values, and satisfaction differences among three cultural/ethnic groups: Taiwanese Hoklo, Taiwanese Hakka and Anglo-American forest recreation visitors.

## Methods

In 2011, we surveyed visitors to Basianshan National Forest Recreation Area and Aowanda National Forest Recreation Area in central Taiwan as well as the Timberline Lodge Recreation Complex in the Mt. Hood National Forest in Oregon, U.S.A. Because the national forest areas were vast, a simple random sample of all visitors within the setting would not yield an adequate number of respondents for comparisons. Therefore, we used a purposive on-site convenience sampling approach at sites known to be heavily used by visitors. In Taiwan, we mainly focused on locations such as the visitor center, nature center, picnic areas, parking lot and trail head. In the U.S. surveys, we interviewed visitors at the Timberline Lodge Recreation Complex. We adopted a systematically random selected approach, that is, at each site, every third visitor was asked to complete the on-site questionnaire to maintain a random selected manner (Sallant and Dillman 1994). Overall, we obtained 1251 usable questionnaires, with 525 Taiwanese Hoklos, 102 Taiwanese Hakkas and 624 Anglo-Americans.

## Results and discussion

The results showed that socio-demographic variables such as age, gender, education and income were significantly different between Taiwanese Hoklo and Hakka and Anglo-American forest recreation visitors. Ten out of the 12 recreation "activities participated in" differed among the groups. For visitor values, 8 out of 9 measures differed among groups. And for visitor satisfaction, the 16 satisfaction measures all differed among groups, with 6 out of the

16 measures showing strong associations, as indicated by the Eta values. We also found the main differences for the measures examined were between the Anglo-Americans and the others. On the other hand, we found, to some extent, the two Taiwanese cultural groups were homogenous in terms of the variables tested. Table 1 showed satisfaction differences among three cultural groups. The findings were consistent with those found between Taiwan and the U.S. visitors (e.g., Huang et al. 2012), confirming the cross-cultural differences between nations as well as between cultural/ethnic groups. Findings have implications for forest recreation management. Managers may take advantage of observed differences from this study and tailor their recreation opportunities for a culturally diverse clientele.

Caution needs to be taken in generalizing the study findings. First, we used convenience sampling method to survey visitors and therefore our data was not a random sample. We suggest future research employ stratified random sampling to survey visitors to national forests. Research can be designed to divide the setting into different zones or divide the survey period into four seasons in a year so that field researcher can survey visitors in each zone and season to obtain more representative samples. Second, despite the differences identified in this study, we doubt whether those differences were real cross-cultural differences. In other words, the differences can be from the systematic response bias in the survey cross-culturally. For instance, Taiwanese groups were likely to respond the surveys near neutral scores, whereas the Anglo-American visitors tended to respond on both ends. We suggest future research control some confounding variables such as the standard deviation for the variables tested to gain the "net" differences between cultures. We advocate future research employ more rigid sampling procedures as well as use more advanced data analysis methods to enhance the research validity and reliability.

Table 1. Mean differences in satisfaction among Taiwanese Hoklo, Taiwanese Hakka and Anglo American groups.

Satisfaction measure	Hoklo	Hakka	Anglo
I thoroughly enjoyed my visit to the destination F=153.36*** Eta=.43	4.10 <sup>a</sup>	4.16 <sup>a</sup>	4.75 <sup>b</sup>
I had the opportunity to recreate without feeling crowded F=18.70*** Eta=.17	4.09 <sup>a</sup>	4.14 <sup>a</sup>	4.40 <sup>b</sup>
I could find places to recreate without conflict from other visitors F=10.94*** Eta=.13	4.22 <sup>a</sup>	4.15 <sup>a</sup>	4.42 <sup>b</sup>
My trip to the destination was well worth the money I spent to take it F=88.89*** Eta=.34	3.78 <sup>a</sup>	3.88 <sup>a</sup>	4.44 <sup>b</sup>
The availability of parking was acceptable F=12.93*** Eta=.14	4.00 <sup>a</sup>	4.01 <sup>a</sup>	4.29 <sup>b</sup>
Recreation activities here were NOT compatible F=131.74*** Eta=.41	2.63 <sup>a</sup>	2.58 <sup>a</sup>	1.66 <sup>b</sup>
I was disappointed with some aspects of my visit to the destination F=85.28*** Eta=.35	2.45 <sup>a</sup>	2.25 <sup>a</sup>	1.59 <sup>b</sup>
I avoided some places because there were too many people there F=24.99*** Eta=.19	2.41 <sup>a</sup>	2.40 <sup>a</sup>	1.93 <sup>b</sup>
The condition of the parking lot area was acceptable F=30.72*** Eta=.21	3.76 <sup>a</sup>	3.76 <sup>a</sup>	4.19 <sup>b</sup>
There is a good balance between social and biological values in the management of the destination F=22.47*** Eta=.18	3.78 <sup>a</sup>	3.90 <sup>a</sup>	4.14 <sup>b</sup>
The number of people here reduced my enjoyment F=16.09*** Eta=.16***	2.36 <sup>a</sup>	2.32 <sup>a</sup>	1.97 <sup>b</sup>
The condition of the roads was acceptable F=84.85*** Eta=.34	3.54 <sup>a</sup>	3.53 <sup>a</sup>	4.29 <sup>b</sup>
The behavior of other people at the destination interfered with the quality of my experience F=55.87*** Eta=.29	2.17 <sup>a</sup>	2.23 <sup>a</sup>	1.52 <sup>b</sup>
The other people here increased my enjoyment F=45.43*** Eta=.26***	3.17 <sup>a</sup>	3.15 <sup>a</sup>	3.76 <sup>b</sup>
The destination and its surroundings are in good condition F=151.75*** Eta=.43***	3.61 <sup>a</sup>	3.75 <sup>a</sup>	4.42 <sup>b</sup>
The availability of maps and signage was adequate. F=52.86*** Eta=.27***	3.72 <sup>a</sup>	3.62 <sup>a</sup>	4.25 <sup>b</sup>

1. \*\*\* Significant at  $p \leq 0.001$

2. Eta was a measure of association, with values 0.10 or less considered weak, between 0.10 and 0.30 moderate, and 0.30 or higher considered strong

3. Scale from 1 = Strongly disagree to 5 = Strongly agree

4. Group means sharing different superscripts differed significantly at .05 level in a post-hoc Scheffe test

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# Race, ethnicity, and outdoor recreation in the United States: Tests of the marginality, ethnicity, and discrimination hypotheses with national-level survey data

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It is well documented that members of racial and ethnic minority groups participate in a variety of outdoor recreation activities at lower rates than whites, and there is a large literature which has explored a number of explanations for this finding. These explanations are usually grouped into three categories: (1) marginality, which focuses on economic reasons for non-participation; (2) discrimination, which centers on the role of hostile behaviors on the part of whites; (3) ethnicity, which purportedly focuses on cultural factors. Despite the size of this literature, it suffers from a number of shortcomings. To begin with, the data used to test the hypotheses are usually not nationally representative. In addition, the possible explanations have not been comprehensively evaluated. For instance, a full range of demographic items has generally not been used in tests of marginality, the discrimination hypothesis has rarely been tested at all, and simple measures of group membership rather than actual measures of culture have usually been employed. In this paper, we add to the literature by testing all three perspectives with national-level data from the National Park Service (NPS) Comprehensive Survey on the American Public and from the General Social Survey (GSS). We examine differences among African Americans, Hispanics, and non-Hispanic whites.

We utilize two dependent variables: whether the respondent has visited a national park during the past two years (from the NPS data), and whether the respondent has gone camping, hiking, or canoeing during the past year (from the GSS data). Since these variables are dichotomous, we use logistic regression to examine the association between these measures and a number of independent variables of interest. We begin by examining the association between the dependent variables and race/ethnicity. Then, we add variables to the model in blocks which correspond to measures of marginality, discrimination, and culture. We note the changes in the size of the race/ethnic effects as additional variables are added to the model, in order to gauge whether a particular hypothesis is supported by the data. For instance, if the marginality hypothesis is true, then the size of the race/ethnic effects should decline when marginality related variables are added to the model.

Our main findings are presented in Table 1. Race/ethnicity is operationalized as a dummy variable, with whites being the excluded category. Our results replicate the well-known finding that African-Americans and Hispanics are both less likely to visit national parks than whites; the difference between African-Americans and Hispanics is not statistically significant. For example, the log-odds of African-Americans having visited a park are 1.230 lower than those for whites. We thought that perhaps some of these

differences were due to variability in place of residence of members of the groups.

However, controlling for Census region changed the results very little. Adding measures of marginality (measured by education, income, and marital status) to the model reduced each race/ethnic coefficient by about .2, which represented about 13% of the African-American/white difference and 22% of the Hispanic/white difference in the model that included region. Next we added our measure of discrimination: whether the respondent felt safe in national parks. This resulted in a decline in of .1 in the African-American and Hispanic coefficients (amounting to 7% for African-Americans when compared to the previous model and 14% for Hispanics). Finally, we added a measure of culture: whether the respondent enjoys out-of-town trips to experience nature. This changed the coefficient for Hispanics very little, but did decrease the value for African-Americans by .2 or 28%, indicating a strong aversion to this type of activity among African-Americans. In the end, then, using the model controlling for region as a baseline, we were able to explain 42% of the African-American/white difference and 30% of the Hispanic/white difference in visitation to national parks. The most important factor in accounting for the lower rate of visitation among African-Americans seems to be an aversion to the types of trips required to get to a national park.

We replicated these results for respondents younger than 45. Among younger people, the differences between Hispanics and whites were smaller. However, those between African-Americans and whites were larger. In addition, our independent variables explained about the same percentage of the Hispanic/white difference when compared to all respondents, but less of the African-American/white difference.

Clearly, our measures of discrimination and culture are imperfect. For instance, feeling unsafe in a national park may be related to things like fear of traffic or of wildlife, in addition to fear of racism. Similarly, an aversion to out-of-town nature trips among African-Americans might be as much a fear of racist encounters during travel (discrimination) as a deeply ingrained group preference (a cultural phenomenon). We thus supplement our analyses of the NPS data with GSS data from 1993; this was the only year in which leisure activity questions were asked in the GSS. In this analysis we found no difference between Hispanics and whites in propensity to go camping, but a large difference between African-Americans and whites. Further, the independent variables explained virtually none of the difference between African-Americans and whites. To measure discrimination, we used a question about allowing racists to



Table 1. Logistic Regression Analyses

National Park Service Data Regressions for All Respondents					
Independent Variables in Model					
Group Compared to Whites	Race/Ethnicity	Region	Region, Education, Income, and Marital Status	All Demographics and Feeling of Safety in National Parks	All Demographics, Feeling of Safety in National Parks, and Whether the Respondent Likes Out-of-Town Nature Trips
African-American	-1.230	-1.219	-1.059	-.984	-.707
Hispanic	-.814	-1.034	-.805	-.690	-.727
Percent Decline in Race/Ethnic Coefficient Compared to Previous Model	African-Americans		13.13%	7.08%	28.15%
	Hispanics		22.15%	14.29%	N/A
National Park Service Data Regressions for Respondents 44 Years of Age and Younger					
African-American	-1.688	-1.775	-1.652	-1.625	-1.310
Hispanic	-.531	-.749	-.529	-.420	-.488
Decline in Race/Ethnic Coefficient Compared to Previous Model	African-Americans		6.92%	1.62%	19.41%
	Hispanics		29.40%	20.57%	N/A
General Social Survey Data Logistic Regressions					
Group Compared to Whites	Race/Ethnicity	Region	Region, Education, Income, and Marital Status	All Demographics and Whether Racists Should be Allowed to Speak	All Demographics, Racist Speech, Religiosity, Musical Tastes, and Sociability
African-American	-2.048	-1.973	-1.916	-1.908	-2.107
Hispanic (coefficients for Hispanics not statistically significant)	.196	-.319	-.145	-.141	-.061
Decline in Race/Ethnic Coefficient Compared to Previous Model	African-Americans		2.89%	0.42%	N/A
	Hispanics		N/A	N/A	N/A
<b>NOTE: Numbers in the rows labeled "African-American" and "Hispanic" are logistic regression coefficients. All are statistically significant at the .05 level unless otherwise noted.</b>					

speak, figuring that African-Americans who did not want to allow this were more likely to have experienced discrimination. As measures of “African-American culture,” we included an item on the frequency of visiting relatives, as well as measures having to do with liking blues and gospel music.

Our results suggest that Hispanic/white differences in outdoor recreational practices are narrower than their African-American/white counterparts and may be declining. In contrast, we find larger and growing differences between African-Americans and whites. Further, it seems as though the cultural hypothesis best explains the African-American/white disparity, not in the sense of what is viewed as “traditional” African-American culture but rather in what appears to be a widespread aversion to these types of activities.

# Fear and loathing in the forest: Immigrant perceptions and experiences of natural area recreation in New Zealand

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Research on the participation of immigrants in outdoor nature-based recreation pursuits demonstrates that immigrants and ethnic minority groups have lower participation rates (Gramann & Allison, 1999). However, there is a call to go beyond participation rate research and explore the meaning and significance of participation or non-participation in recreation (Carr & Williams, 1993). Similarly, we also need to explore the mediated nature of engagement with outdoor recreation sites and to ask how the intersection of social place and geographical space informs inclusion or exclusion along ethnic lines (Darby, 2000).

New Zealand is similar to many Western societies in that immigrants from non-Western societies are now significantly represented in the population. Research and anecdotal data indicate that their outdoor nature-based participation rates differ from the settled majority, as do their perceptions of these natural habitats. Their lower participation rates are often contrasted with higher participation rates amongst settled New Zealanders. But research here to-date has not explored why these differences exist.

Understanding how and why people interact with space necessitates exploring how gender, class, sexuality and ethnicity produce and reproduce space and place and how power relations map leisure space/s. Not belonging – or being out of place and conversely belonging to a place and space, has been explored by various researchers empirically and theoretically. Darby's (2000) research, for example, illustrates how walking in the English countryside is deeply political, underpinned by a geography of inclusion and exclusion along class, racial and historical lines. Ethnic minorities such as Blacks and Asians have low participation rates in walking groups and do not commonly walk in the countryside alone. Following Lefebvre (1991), our analysis explores how social place intersects with geographic space and how gender, class and race shape the nature and the navigation of these spaces.

This paper draws on the qualitative component of a mixed method study conducted in the cities of Wellington and Auckland, New Zealand, which explored how new immigrants engage with non-human nature in protected areas – national and regional parks, their perceptions of these areas and what the implications are for the provision of leisure experiences in these spaces and places. In-depth, face to face, semi-structured interviews were conducted with 25 recent immigrants who resided in the cities of Auckland and Wellington, both major immigrant destinations in New Zealand. Participants in the interviews were self-selected through a prior postal survey, and included people from: China (5), Colombia (1), Korea (1), Japan (1), South Africa (2), England (2), Russia (1), Zimbabwe (1), Tokelau (1), India (3), Philippines (4), Indonesia (1), and Samoa (2).

These interviews provide an opportunity for some tentative observations about what shapes immigrant experiences of outdoor nature-based recreation and what mediates understandings of national and regional parks in New Zealand.

The migrants' stories reported here provide a window on human/non human relationships in New Zealand society. Recent migrants in New Zealand bring with them environmental values and expectations of what recreational participation in outdoor nature based settings should and might entail. For some new migrants these relationships metaphorically parallel their settlement experiences. For many, the New Zealand landscapes are exotic and fear-filled places. For others, coming from places where the outdoors is a signifier for poverty and danger, they are places to avoid. For many they are simply uninteresting, creating challenges for how landscape 'managers' can create connections between these new citizens and New Zealand's natural places. This may particularly apply to those who come from societies that have different conceptualisations of the human/nature relationship e.g. Chinese migrants draw on their own philosophical traditions shaped by Confucianism and Daoism which stress the need for the cultivation of nature – whereas the dominant paradigm they encounter in New Zealand's park landscapes is one of ecological integrity, and naturalness at all costs. For immigrants, engaging with a new or 'alien' habitat such as a national or regional park can be problematic if their philosophical socialisation challenges dominant Western notions of what constitutes nature, the wild or a park and prescriptive understandings of what human relationships with 'nature' should entail. The migrant accounts in our study reveal clearly that the ability to find points of connection with the landscape is central to integration into a new society. Engagement with national and regional parks is a reflection of the politics of integration for new settlers in New Zealand society. This engagement is shaped by prior socialisation, ethnicity/race, class and gender and parks as social institutions reflect the politics of inclusion and exclusion. Sadly, for some, their descriptions of New Zealand parks and where they stand in relation to them tell us that there is no place or space for them.

Migrant perceptions and experiences of these natural habitats also throw into relief assumed givens about the role of national parks and the social and cultural function that these institutions fulfil (or could fulfil) in New Zealand society. Our research raises a number of important questions about the provision of outdoor leisure opportunities and also about the politics of the environment in New Zealand. It demonstrates that human/non-human relationships are not politically neutral, people do not see spaces and places through the same lens – there is no singular nature only a diversity of natures (McNaughten & Urry, 1998).

Differing cultural conceptions can directly challenge natural resource management which is shaped by dominant cultural conceptions which are typically unquestioned and taken for granted. There is no generic user in a multicultural society, but these institutions often presume there is. Increasingly pluralistic societies, such as New Zealand need to embrace broader and more critically reflective understandings of these places and spaces as sites that produce and reproduce social inequity, particularly if these places remain central to sustaining our habitat.

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# Governance and sustainable tourism in World Heritage sites – Can sustainable tourism serve as a tool for improved protection of UNESCO World Heritage sites?

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## Introduction

The UNESCO World Heritage List contains over 900 of the world's most important natural and cultural areas and therewith contributes to their conservation. The inscription of a site in the list means not only the recognition of its Outstanding Universal Value (OUV) and its integrity, but also implies the need to protect and manage it (Edroma 2004). A site being removed from the World Heritage List due to endangered site values means not only an irreversible loss of biological and cultural diversity, but also of our common heritage of humanity.

Despite the crucial contribution of the UNESCO World Heritage Convention to secure the World Heritage site values, the sites face various significant challenges and many portray severely threatened protected areas. Impacts result from direct degradation (human pressure, armed conflict, war, natural disasters and pollution), but also poaching, invasive alien species and global effects (e.g. impacts of climate change) can cause loss of biodiversity. Additionally, uncontrolled urbanization and tourism development can result in direct and indirect impacts on the site, whereas a lack of political support and sustainable finance can largely influence the effectiveness of managing the site and preserving its OUV.

An often discussed – yet to be critically considered – concept that could link conservation and development in World Heritage sites is sustainable tourism. Tourism in general has the potential to generate economic benefits that support site conservation and the regional as well as national economy. However, poorly managed tourism development can also have severe consequences for the site's integrity and its OUV, possibly also degrading the quality of the visitor experience (Tourtellot 2007 in Borges et al. 2011; Pedersen 2011; UNESCO 2012). Thus, management of tourism in a sustainable way is often discussed as benefitting conservation purposes.

Governance was identified as a key factor for the conservation of protected areas, having a major influence on the achievement of protected area objectives (Dearden & Bennett 2005; Mehnen et al. 2009; Tilcepa 2003 in UNESCO 2005). A cornerstone of the debate on protected area governance was the 5<sup>th</sup> IUCN World Parks Congress in Durban 2003. Since then, the topic has become more and more influential, and research has been carried out on 'good governance' (Borrini-Feyerabend 2003, Graham et al. 2003), on the application of governance to different categories of protected areas (Fürst et al. 2006; Mehnen et al. 2009; Stoll-Kleemann et al. 2006) as well as on trends in protected area governance (Dearden et al. 2005). Some research has been carried out on World Heritage and governance (Tho-

mas 2003; Thorsell 2003) in preparation for the workshop on governance and World Heritage at the 5<sup>th</sup> IUCN World Parks Congress, regarding the World Heritage Convention as a tool of governance.

## Methodological approach and expected results

Recognizing governance as a key factor for the conservation of protected areas (see figure 1), the purpose of our research is the development of a governance model for World Heritage sites, which contains of components such as actors, their interests, strategies and instruments (globally, nationally, regionally, and locally). The development of the governance model is based on literature research of previous work being done on governance in protected areas (Borrini-Feyerabend 2003, Graham et al. 2003, Thomas 2003) and the application of qualitative social research methods. Through experts' consultation, the model will be further developed and tested. The governance model for World Heritage will focus on the context of World Heritage sites as specific types of protected areas, being subject to the World Heritage Convention as a governance tool on international level.

Governance helps to enable effective site management and to reach the desired outcomes. Management effectiveness assessments serve to measure the effectiveness of management to preserve the sites' OUV. Therefore, the relationship between governance and management effectiveness needs to be increasingly understood (Dearden et al. 2005). Thus, management effectiveness has to be analyzed within the governance model as an important component of preserving the site values, but largely influenced by the governance framework (see figure 1). It is assumed that the evaluation of the interdependencies between governance and management effectiveness can further disclose success factors and challenges for site management to preserve the sites' OUV taking into account the governance structure.

As participatory governance evaluation processes are of great importance (Borrini-Feyerabend 2003), the application and analysis of the governance model will in a next step be carried out in different case study sites – European (Northern) and Non-European (Southern) UNESCO World Heritage sites. Thereby, the largely different economic, social and cultural contexts, having an impact on the governance structure, are recognized, and the diversity of World Heritage sites is represented. Expert interviews as well as stakeholder workshops are used to gain actors knowledge. The application of the governance model helps to identify the impacts differing between the analyzed World Heritage case study sites.

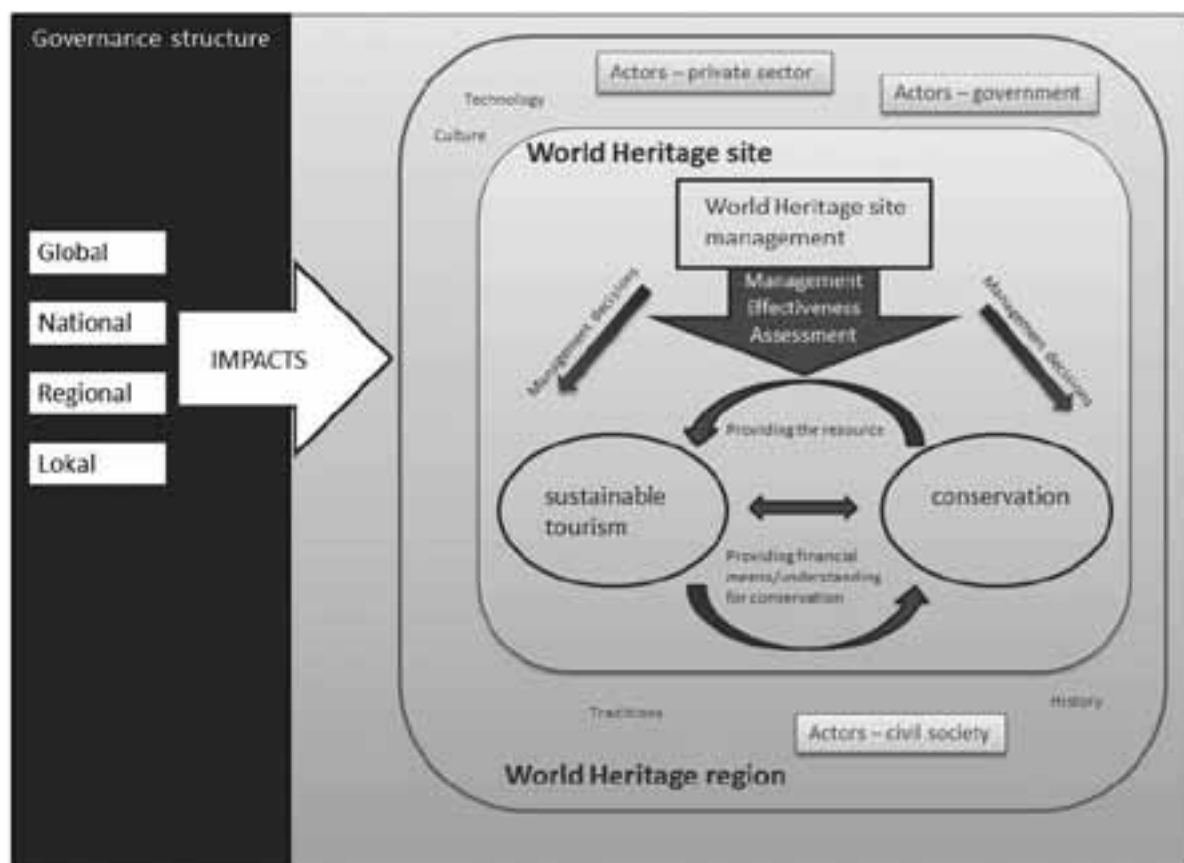


Figure 1. Impacts of governance on UNESCO World Heritage sites; Source: own illustration

Considering the critical application of sustainable tourism as concept to link sustainable development and conservation, the question of whether and under which circumstances sustainable tourism as a strategy can improve the protection of World Heritage sites needs to be further analyzed on the basis of the case study sites. Effective management of sustainable tourism as a part of the overall World Heritage site management is dependent on the particular governance structure the site is situated in. Thus, the study results should indicate the relation between governance structures – stretching from local to global levels, involving different stakeholders including the management, tourism sector, local community, regional and national government etc. – and sustainable tourism management assisting in preserving the site values. Best practice examples are to be identified as an important output of the study.

## Conclusion

The main output of the study is the identification of ways for a better long-term protection of World Heritage sites' OUV, taking into account the governance structures and their impact on effective management. The application of the governance model in the case study sites helps to identify success factors and challenges of governance structures in regard to World Heritage as well as to develop strategies to improve protection in the specific sites. Whether sustainable tourism can be a tool to enhance protection of World Heritage sites, and the impact of governance structures on it, will be another important output of the study.

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# A supply-side perspective on tourism enterprises in biosphere reserves – case study of Biosphere Reserve Rhön

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## Introduction

In order to increase the positive impact of tourism on the regional economy, regional development agencies, politicians and researchers are focusing primarily on understanding the trend towards regionalization and regional labeling. Because of this shift, improving the efficiency of local business value chains is crucial. Such improvement strategies can be found in many rural areas in Europe, and are widely analyzed (Renting, Marsden and Banks, 2003; Ilbery and Maye, 2005).

The “Dachmarke Rhön” (DMR) represents a strong model for such improvements across the 15 German biosphere reserves. This article examines the supply-side linkages of the tourism business members of the DMR, and serves to answer the following research questions:

- Which types of companies are participating in the DMR trademark?
- How are these businesses integrating various value chains, particularly in terms of regional and non-regional buying?
- What types of management decisions are supported?

Finally, this study serves to provide the various management perspectives on this topic and through doing so to uncover the issues that local and regional supply chains may currently be facing.

## Case study Biosphere Reserve Rhön

Biosphere reserves are protected natural areas of the Man and Biosphere program of United Nations Educational, Scientific and Cultural Organization (UNESCO). These protected areas are designed to provide an opportunity to study the balance between nature conservation, biodiversity and sustainable economic development (MaB, 2008).

The peripheral mountain ranges of the biosphere reserve Rhön are located in central Germany (see map 1). Tourism to these mountain ranges is an important factor for regional development and a crucial source of income in the area and research shows that the biosphere reserve Rhön attracts a total of 6.37 million visitors per year. In total these visits generate a turnaround of €185.6 million per year (Job and Kraus, in press), proving the importance of the biosphere reserve as a tourism attraction for this rural area.

A common regional development strategy is to increase awareness for the region through integrated marketing campaigns. The content of the campaigns calls for cooperation from stakeholders and highlights the specific features and benefits of the area. The DMR network has been developed within the biosphere reserve Rhön with aims to promote the regional identity. In addition, as tourists are seen as an

important customer segment for local businesses, it aims to improve regional value chain efficiency specifically in order to support the growth of regional production.

## Theoretical background and methodology

Several concepts including alternative food networks, short food supply chains and value chains are widely recognized tools for stimulating regional economies focusing on supply side activities. In order to promote sustainable economic development, these approaches aim to establish as many value-chain links (primary production, processing and consumption) as possible within a region. This does not mean economic autonomy for the given region, but rather greater access to regional value chains through increased regional collaboration and commodity flows (Rauch, 2009). One possible way of achieving this goal is through selling regionally produced goods in local businesses that experience a high rate of tourism. In doing so, the local population has the opportunity to increase prices of local goods in response to the increased product value perceived by visitors.

The Filière concept is one key in understanding these issues, and was used to structure this study conducted in 2011. It demonstrates a clear model for understanding commodity flows, singular steps of production, stakeholders involved and the geographic dimensions of a particular production process (Schamp, 2000). From this information, the ratio of regional and supra-regional economic relationships is derived, which can be used to evaluate the effectiveness of regional supply chains. 55 managers of tourism businesses within the DMR were interviewed using both quantitative and qualitative face-to-face interviewing techniques.

## Results

Within the sample of 55 tourism businesses, 14 served only food and beverages while the remaining 41 businesses also offered lodging. 85% of the managers interviewed employed less than 10 full time employees year round. The overall average turnover was approximately € 300,000. These employment and turnover figures confirm the small nature of the businesses included in this study, which is normal for this sector within the study area.

On the supply side, the results show that purchase linkages to trade and processing trade are most important for the generation of services. Within this group, wholesale costs are accounting for 31.6% of expenditures, despite the DMR promotion of cooperation between small businesses. The wholesalers are mostly located in the cities outside of the biosphere reserve and due to the characteristics of wholesale only a small proportion of the revenue remains within



Map 1. Study area and distribution of DMR businesses

the region. This highlights that there may be a gap in the market for small food processing companies and farmers located within the biosphere reserve. Currently only 37.5 % of total purchasing is sourced from within the boundaries of the biosphere reserve.

In addition, results show various types of purchasing patterns, which are dependent on the company philosophy and the managers' understanding of regional sourcing. Further-

more quantity, price, quality, availability of products and flexibility for buying are key drivers for purchasing outside the region.

The results highlight the opportunities and constraints in developing regional value chains within tourism and will inform future development of regional programs in biosphere reserves.

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# Hoge Kempen National Park (Belgium) – The economic impact of visitors as a crowbar for nature conservation

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In 2006 the first and only National Park in Belgium was established: “Nationaal Park Hoge Kempen” (Province of Limburg).

In a densely populated area, finding open space of more than 5000 ha was not easy.

It was even more problematic to find public and political support for a project with the aim to protect nature in an economic declining region (due to the closing down of the vast coal-mining industry). We were able to use nature conservation as a key issue in economic development of the broader region. Recently, the economic impact of nature of the ‘Hoge Kempen’ region was estimated at nearly 191 M.euro’s/year (1).

One of the key elements of this success was the establishment (in 2002) by the Flemish government of a multi-disciplinary team (*task force*) (2). This task force created a bridge between the public body protecting nature on one hand, and entities dealing with spatial planning, regional development, heritage, public transport, tourism, recreation etc. on the other hand. This task force was not limited to the park, but it also addressed issues in the surrounding areas. Another task of this team was to maintain a vast communication strategy for the public, thereby translating a governmental-, legislative-, spatial-, financial- and organizational complexity into one attractive message: *we protect sensitive and endangered biodiversity, “for the benefit and enjoyment of the people”* (Mission Statement of Yellowstone National Park, 1872).

Besides improving the natural heritage (defragmentation, removal of artifacts, restoration of heathland etc.), the Flemish Agency of Nature and Forestry established a cycling network in and around the park that includes a network of signposted hiking paths and paths for horseback-riding. Volunteers (‘Rangers’) also offer guided tours and entrepreneurs in tourism are trained to become park ‘ambassadors’.

Gateways to the National Park were designed as both multi-functional starting points (hiking, cycling etc.) and touristic attractions and now receive more than 300 000 visitors each year

These 5 gateways are situated outside the park ( up to 3 km in some cases). In this way, sensitive ecosystems are protected from recreational pressure. By doing so, we were able to combine the best of two worlds: increasing the number of visitors in order to create economic benefits and lowering the impact on sensitive ecosystems in order to preserve nature for the future.

## Research on economic impact of visitors

All visitors are electronically counted (in order to learn about seasonal and spatial spread, long term changes etc.) and specific questionnaires give insight into the willingness

of visitors to pay, travelling distance, duration and motivation of the visits, expenditure behavior etc. This makes ‘Nationaal Park Hoge Kempen’ one of the best documented cases on visitor behavior in Belgium (3).

Each year, an average of 270 000 (period 2005-2010) cyclists on the cycling network (= 240 km) of the broader region of the National Park are counted. A questionnaire (2004) pointed out that 80% of these cyclists are day-trippers, spending an average of 15.90 Euro/day.

20% are sleep-overs, and they spend 66 Euro/day (4).

In a similar way, hikers on the hiking paths (= 200 km) were electronically counted and sampled (N=650): on an average of 177 000 (period 2007-2010), 50% are local recreational hikers (spending 4.5 Euro/day), 34% are one-day tourists (spending 12 Euro/day) and 12% are overnight tourists (spending 13 Euro’s/day, costs for meals and accommodation excluded). One third of this group of overnight tourists indicated that the national park itself was the main reason of their stay. Money was spent on food and beverage (43%), visiting attractions (11%) and hiking maps (7.5%).

The average age of hikers in the national park is 52, and they typically drove 49 km (mainly by car) and stay 3 h 20 min. 90% say they will come back in the near future (an average of 6 times in 3 years). 40% use a hiking map and 12% have already used the ranger service (guided tour). This creates an economic benefit of the hiking component of the national park of 3 M.Euro/year (5).

The seasonal spread is also remarkable. While hiking peaks in (early) spring and (late) autumn, cycling is concentrated from May till September.

Another significant number is the number of visitors at the 5 gateway visitor-centers. All of these gateways were created as extensions and improvements of existing tourist attractions. Visitation increased by 80% (period 2005-2011) (3).

The total number of cyclists, hikers, participants on guided ranger-tours horseback riders and visitors of gateways resulted in an average of 725 000 visitors in 2011, which is an increase of 32% since 2005 (3).

The increase of tourists related to the establishment of the park in 2006 is also reflected in the number of overnight stays. During the period 2005-2009, the number of overnight stays in the 6 communities of the park increased by 13%. The overnight stays in Belgium in this same period increased by 3% (6).

All of this information demonstrates an economic benefit 24 M.Euro/year created by the park that is directly related to tourism and recreation. (3).

The most important aspect of the establishment of the park is the fact that these positive, measurable results directly influenced the political will to invest in the improvement of the natural conditions and the ecological resilience



of the park: transforming motorways into cycle-paths, an ecoduct to lower the impact of a highway, transformation of farmland, nature restoration in gravel- and sandpits and much more.

This project has re-connected nature conservation and tourism in a win-situation for both interests.

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# Tourism destination brand image of Beypazari as perceived by hikers in Ankara

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## Introduction

Beypazari is a district of Ankara with over 46.000 residents and it is located 100 km west of Ankara. It is recognized on both domestic and regional scales as an example of good practice because of the conservation of traditional architectural and cultural assets. With the contributions of local and central governments as well as the conscious and devoted efforts of its local community, tourism has become an alternative income-generating source and tourist arrivals have increased almost 100% between 1999 and 2009. Beypazari has an important potential in terms of tourism and the environment. The district is conserving architectural and cultural values, for example, it is maintaining its approximately 150-year-old lifestyle. During the summer time, there is an increase in short vacations to Beypazari with the number of visitors sometimes reaching 5,000 on weekends. Because of its proximity to two major cities – Istanbul and Ankara – Beypazari is preferred for excursions. The organization of different cultural activities such as festivals, trekking and practice-based workshops make Beypazari attractive for those who look for alternative choices for the weekends. Beypazari has emerged as a popular destination for daily or short time visitors mainly from Ankara and other neighbour cities because of its natural values in addition to its cultural attractions. These include trekking routes, rock cliff valleys, forests, wetlands, creeks and rare animal and plant species (Municipality of Beypazari 2010, Gunes et al. 2010).

The purpose of this study is to (1) identify the perceptions of trekkers about attributes and general attitudes and behaviours of Beypazari, and (2) understand the effect of natural features and wild animals on its brand image. Such wildlife occurs in surprisingly close proximity to Beypazari, which is unlike other destinations elsewhere in Turkey.

## Methodology

The sample consists of 40 trekkers who have been in Beypazari and go trekking regularly around Ankara. Total number of trekkers in Ankara is estimated at about 200 (maximum) individuals (Kocak, 2010).

A questionnaire based on Baloglu et al. (1999) was conducted. This survey included 49 questions about demographic, affective, perceptual/cognitive, and open-ended evaluations of Beypazari. Affective evaluations of the destination were measured by using 6 affective image items on a 5-point scale. Perceptual/cognitive evaluations included 43 items and respondents were asked 33 questions including 7 items about nature tourism potential of Beypazari. Respondents rated each question on a 5-scale, from 1 that presents strong disagreement to 5 which represents strong agreement. There were 7 items about wild animals that respondents were asked to answer: whether they know one,

more, or none of the animals listed that live within the periphery of Beypazari. For unstructured images, respondents were asked to write down the first three concepts that occurred in their minds for Beypazari. Questionnaires were analyzed with SPSS 16.0. Descriptive questions comprised the frequency of respondent trekking tours and how many times visitors have visited and stayed in Beypazari.

## Results and discussion

The majority (74,3%) of the respondents were in the age group of 20–39 years old and 59% of the respondents were female. Of the respondents, 69,2% were single and all have at least a bachelor's degree. All of the respondents had been in Beypazari several times, however, 74,4% of respondents did not stay in Beypazari before.

Respondents were in agreement with the expression of “Beypazari is a pleasant place” (4,23). On the contrary, respondents did not agree that “it is an extraordinary place (2,82)”. Evaluations on perceptual/cognitive items showed that respondents found Beypazari beautiful and might consider visiting again (4,13). Respondents most liked old restored mansions (4,44) and local culture (4,31). Most of the respondents tended to go to Beypazari to spend their weekends (4,21), to take photographs (3,79), have some local food (3,69), and for trekking (3,33). Respondents usually do not go to Beypazari for shopping (2,72), and generally felt safe in Beypazari (4,41) and found local people to be friendly (4,28).

To understand the respondents' views regarding nature based tourism in Beypazari, 7 items were asked. Respondents were most interested in trekking (4,41) followed by observation of the Egyptian vulture in Beypazari (4,36). Respondents were also interested in going bird watching in Inozu Valley (4,21) and seeing the endemic plants of Beypazari (4,21) as well. Respondents found Beypazari as naturally attractive (4,13) and eager to know more about its nature.

To find out whether respondents were aware of these creatures as a part of Beypazari's brand image, respondents were asked to mark if they know one, more, or none of the species listed that occurs around Beypazari. 53,8% of respondents knew that the Egyptian vulture occurs around Beypazari, followed by the black stork (41,0%). The least known species was brown bear (28,2). Finally, 33,3% of respondents were not aware of any species living around Beypazari while 66,7% were aware of one or more species.

## Conclusion

This study emphasizes the importance of destination images of small towns as they try to generate income from tourism. Besides cultural and historical attractions, natural characteristics might be other important attractions to

increase the number of tourist arrivals. Women might be keener on trekking tours than men as indicated in our study findings. And, education level seems to be directly proportional to the number of trekking participations. Our study data also suggest that people with higher levels of education tend to participate in outdoor related tourism activities compared to people with lower levels of education. It appears that trekkers like visiting Beypazari to experience its famous old mansions and local food as well as its natural landscape. However, trekkers do not consider spending the night in one of those old mansions. Local authorities and tourism enterprises should consider increasing the number and diversity of tourism activities to increase the number of staying in Beypazari.

Beypazari has the potential to diversify tourism activities with respect to nature and wildlife tourism as it holds several large mammal and bird species and a diverse flora. Organizing wildlife observation trips and botanic tours for international tourists may help to increase the number of accommodation revenue in Beypazari.

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# Tourism trade-offs: An analytical framework for visitor management in fresh water systems

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Tourism facilities with views of rivers and lakes are extremely popular landscape and cultural tourism destinations. As such, water-rich areas experience high tourist demand which can, and often does, contribute to degradation of water resources. In many cases, it is possible to map the types of ecological disturbances associated with visitation (Hadwen et al., 2008). Disturbance of soils and sediments occurs where people walk, ride, or drive and often results in track widening, deepening, and erosion. Motor vehicles and powerboats can contaminate land and water systems through fuel spills, oil and grease discharges, and engine operation. Fishing can exacerbate decline of freshwater species, and fish stocking of lakes and streams can result in domination of introduced species. Litter and waste pollution are likely to occur with visitation for any purpose.

The framework presented here is based on identifying relationships between ecosystem services (which provide benefits and resources to people), visitation for tourism and recreation, and potential trade-offs that may occur in order to maintain visitor numbers. Understanding these interactions is important as the Millennium Ecosystem Assessment (MA) proposed that action was essential “to enhance the conservation and sustainable use of ecosystems and their contributions to human well-being” (2005, ii). Ecosystem services include *cultural* services such as recreational, aesthetic, and spiritual benefits; *provisioning* services such as food and fresh water; *regulating* services such as climate regulation and water purification; and *supporting* services such as soil formation and nutrient cycling.

Access to freshwater is identified as a key ecosystem service and use of this resource is now considered to be well beyond sustainable levels, currently and into the future. It is imperative that those involved in development of visitor facilities and services consider water quality and quantity in the early stages of planning, implement strategies that address economic, social and ecological sustainability, and design monitoring processes capable of detecting signals from freshwater systems.

Common management strategies include controlling the number of visitors to particular sites; providing designated paths or diverting traffic away from fragile areas; building shoreline facilities such as jetties, lookouts, boardwalks, or other structures; restricting vehicle or boating access; and providing waste cans and toilets. Interventions to mitigate ecosystem degradation may reduce or improve the attractiveness of particular tourism destinations. For some tourists, evidence of ecological damage and human intervention through built environment changes may substantially detract from the experience they seek. For others, installation of visitor services and amenities may well contribute to heightened experience through ease of access or perceptions of lower risk (Pigram, 2006).

However, some associated impacts on ecosystem services are not as easily managed. Increased turbidity, eutrophication, toxic exposures, weed infestation, or presence of exotic species can result from human visitation and disturbance of local ecosystems. This can become particularly problematic when visitors seek to benefit from cultural ecosystem services, but overuse in popular areas results in the loss of supporting, provisioning, or regulating ecosystem services, with consequential reduction in cultural services.

To better manage sites where visitation occurs, some natural resource managers have begun to develop setting classification systems that assess landscape appearance (from undeveloped to developed) and the presence (or lack) of facilities (Seqwater, 2009). The classification system currently in use in southeast Queensland (and a similar system being developed by the Swan River Trust in Western Australia) was adapted from the Recreation Opportunity Spectrum, a conceptual framework designed to help clarify relationships between recreational settings, activities and experiences (Clark and Stankey, 1979). Classification of settings is designed to assess the diversity and range of recreational opportunities, and determine the most appropriate sites for particular activities within a regional area (Parkin et al., 2000). It is recognised that visitors may have different expectations and seek different experiences within specific settings, with different settings attracting different types of visitors.

Our framework provides a vehicle for examining the systemic nature of ecosystem services and trade-offs, enabling consideration of both how and why trade-offs between ecological, social and economic effects might occur. It considers visitation settings, the features of an ecosystem that appeal to visitors in each setting, and the ecosystem services that are subsequently derived in each case.

From the perspective of the tourism sector in its broadest sense, this framework identifies five properties of aquatic ecosystems that have remained relatively unconnected:

1. Appeal for visitors;
2. Ecosystem service(s) that match desirable features;
3. Processes that change the feature;
4. Relationships between visitor experience, behaviours and ecosystem changes; and
5. The trade-offs made when ecosystem services are compromised.

This presentation will discuss the types of trade-offs that commonly occur and the many challenges faced by those working within the freshwater aquatic tourism and recreation industry to convert relatively abstract trade-offs into management responses. The essential value of this analysis framework is centered on developing an understanding of the systemic nature of trade-offs, describing decisions by

Table 1. Relationships between aquatic ecosystem features with appeal for visitors (water, biodiversity and facilities), processes that may change features and visitor experience, and potential trade-offs between ecosystem services

Aquatic ecosystem features with appeal for visitors	Processes that change features (with potential to compromise the ecosystem service)	Relationships between visitor experience and changes in features	Trade-offs made among ecosystem services
<b>Water</b>			
<b>Clarity (clear water)</b>	Eutrophication (nutrient delivery and oversupply) and sediment delivery through erosion from access points and trails	Changes in water quality from clear to turbid likely to lead to reduced visitation; certainly expect a reduced number of swimmers	Choices made to enhance cultural services where overuse or inappropriate use comes at the expense of supporting and regulating services. This might occur as a redistribution of services: trading access (cultural) for water quality (regulating)
<b>Quality (absence of odors)</b>	Removal of riparian vegetation and shade	Removal of riparian vegetation and shade may increase water temperatures and enhance appeal for water-based activities	Decrease in water quality may undermine cultural services with visitors going elsewhere (trading one destination for another, where the process might be repeated)
<b>Quantity (availability of water for consumption)</b>	Discharge can change biogeochemical processes and result in increased toxicants	Potential for state of water to change from clear to turbid. If accompanied by nutrients or shoreline decay, site may be less attractive with elevated perceptions of risk to health	
<b>Water views</b>			
<b>Biodiversity</b>			
<b>Locally characteristic plants and animals</b>	Changes in riparian zone structure and function	Bird-watchers and recreational fishers may respond negatively to any loss of aquatic vegetation or loss of associated habitat	Where aquatic habitats and their species are manipulated to enhance cultural services, some regulating services (e.g., flood storage; soil, sediment, and nutrient retention) are enhanced at the expense of others (e.g., water purification/treatment; species trophic interactions)
<b>Absence of vector-borne and waterborne pathogens</b>	Changing aquatic habitat to suit particular forms of visitation	Visitors are attracted to protected areas to experience native character of an area; human-wildlife interactions can increase wildlife abundance (of some species) but decrease diversity; relationships may be strongly seasonal	Enhancing cultural services associated with fishing stocking means eroding (trading off) regulating services (particularly species trophic interactions, biological control agents) and perhaps even other cultural services (like educational or nature study)
<b>Emergent plants in water, overhanging vegetation, riparian shade</b>	Disturbances associated with overuse (too many visitors), which can reduce species diversity and adversely influence animal behaviour or result in introduction of weeds or other non-native species		
	Increased fishing opportunities in some areas in response to fish stocking		
<b>Visitor facilities</b>			
<b>Accessibility to water bodies (short and safe when desired)</b>	Erosion of landform features	Too few, just right, or too much: provision of features and facilities, or the presence of other people, will be perceived positively until an individually determined point is reached, after which perceptions will be negative	Increased visitor numbers can lead to a need to change accessibility (spatial and temporal) at key sites; supporting and regulating services are exchanged for cultural services; with trade-offs among access, demand, and increases in visitor numbers occurring at key sites
<b>Land-based infrastructure</b>	Access point modifications and changing facilities influencing the use and visitor loads at key sites		
	Access facilitated through infrastructure like jetties, boardwalks, with disturbances changing water-sediment interactions		

acknowledging trade-offs made, and developing both non-market and market-based approaches that take them into account.

Selected examples of the types of trade-offs that might

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# Certification as a tool for sustainable development in winter sport destinations – challenges for “old” and “new” European skiing areas

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## Introduction

Certification systems are used as a tool to enhance the sustainable development of tourism enterprises. As such these certifications play a key role in sustainable tourism management (Honey 2002, Bien 2007, Font 2002). Certification has also been recognized as a valuable method to influence markets (Buckley 2002, Font 2001). Honey and Rome (2001) define certification as a voluntary procedure which assesses audits and provides a written assurance that a facility, product, process or service meets specific standards and it awards a marketable logo to those enterprises which meet or exceed baseline standards. Ideally the certification differentiates clearly sustainable from unsustainable organizations (Font 2004). It is therefore perceived as an important tool of competitiveness and differentiation, which establishes consumer confidence. The trend toward environmental or sustainable certification has increased in the last two decades.

All these certifications have three crucial functions: environmental standard setting, third party certification of these standards and value-added marketing or environmental communication. In addition to various voluntary approaches the International Organization for Standardization (ISO) has developed more generic environmental certifications that do not apply to one industry in particular (e.g. ISO 14001 and ISO14004). Also, in Europe the Eco-Management and Audit Scheme (EMAS) serves as an environmental benchmark and plays an important role in various branches (Pröbstl et al. 2004, Pröbstl, Jiricka 2009).

## Methodological approach

In this study I compare the environmental problems in the alpine area, the so called “old” world of ski resorts, such as winter sport destinations in Schladming or Lech am Arlberg in Austria, and the “new” world of upcoming ski resorts in Eastern Europe, such as Bansko in Bulgaria. In order to compare the main tasks of the auditing process in these two types of ski resorts we focus on the following aspects and challenges:

- Motivation to participate in an Auditing Scheme
- Relevance and objects of environmental improvement
- Information, marketing purposes and target groups
- Relevance for internal management and the motivation of the employees
- Relevance of additional subjects such as climate change.

Against this background the reasons and options for upgrading the environmental situation based on an auditing system are discussed.

## Main findings

The motivation to participate in an auditing scheme differed at the beginning significantly. In the Eastern countries the auditing was the result of ongoing complains by environmental NGOs. Furthermore the administration underlined the necessity to implement a management system to improve the environmental situation. In the alpine resorts the start was motivated by marketing aspects and the expectation to distinguish oneself from other resorts with a “green image”.

The comparison of the objectives of environmental improvement showed that the different analyses of possible improvements of soil and erosion, regeneration of the vegetation or water management are more important in the eastern European resorts than in the alpine ones. In contrast, in the Alpine resorts the main focus concerning the environmental issues was to improve the summer management and adapt it to the changing situation in the agricultural sector in the mountains as well as to mitigate impacts emanating from an overlapping use e.g. by summer tourism.

Also, the expectation concerning information and marketing effects differed significantly. In the Eastern European resorts the primary purpose of the relevant reports was to be sent to the respective Ministry of the Environment. In the Alpine area the accessibility to the internet and the distribution of brochures for journalists is much more of interest.

The role of the certification on employees is one of the intensively discussed topics in the literature. Many authors highlight that the social aspects of sustainability are often underrepresented. Concerning the relevance for internal management and the motivation of the employees, we also found significant differences. In the Eastern European resort the participatory process was difficult to initiate. Beside the language barrier, basic mistrust or missing experience in participatory planning processes influences the possible effect. It took more time and effort to integrate their knowledge and experience into the auditing process. In the alpine area these problems did not exist. Here the auditing scheme was a relevant tool to discover problems in the interrelationship between various company sections and to enhance the motivation and identification with the enterprise.

Additional topics such as climate change are very important in the alpine resorts only. Since many of the alpine resorts are low lying resorts and this argument is heavily discussed within the local market the interest in this additional tool is much higher.

Overall applying certification in several ski resorts underlines the important effect on the employees and the relevance for the future management in Central and Eastern European countries.

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ORGANIZED SESSION: PANEL

## Management and visitor experience in Europe’s wilderness areas

Session organizer: **Stuart Cottrell**, Colorado State University, USA, [cottrell@cnr.colostate.edu](mailto:cottrell@cnr.colostate.edu);  
**Zoltan Kun**, PAN Parks Foundation, Netherlands [zkun@panparks.org](mailto:zkun@panparks.org)

There are various technical definitions, and actually – as wilderness is a human concept – many more personalised interpretations of wilderness. However for the sake of this suggested session, the initiators suggest using the definition developed by the European Wilderness Working Group (September 2011). Wilderness areas are large unmodified or only slightly modified natural areas, governed by natural processes, without human intervention, infrastructure or permanent habitation, which should be protected and overseen so as to preserve their natural condition and to offer people the opportunity to experience the spiritual quality of nature. The importance of wilderness areas in Europe is increasingly appreciated, in particular as noted by the Report of the European Parliament on Wilderness in Europe, adopted by a margin of 538 votes to 19 in February 2009, that calls for improved protection for wilderness areas through appropriate measures including mapping, research and awareness raising together with provision of adequate funding to achieve this. PAN Parks, the European wilderness protection organisation, applies an integrated approach combining wilderness protection and sustainable tourism, which creates a network of large well-managed wilderness protected areas which would provide a unique experience for visitors; and benefits for local communities. This session is focused on wilderness and management of visitors within wilderness areas. The goal of the session is to link visitor management and experience in wilderness areas to ecosystem services. A series of presentations create a congruent view on implementation of protected area management and research. The concept of destination development and management is approached from different perspectives: the park, visitors, local communities, tourism stakeholders and biodiversity itself. The topics outlined below are based on experiences of the PAN Parks research network, yet the topics are presented within a broad context and we invite others to join this session.

# The economics of wilderness – Role of policy and tourism for enhancing the protection of Europe's wilderness

**Zoltán Kun**, PAN Parks Foundation, Hungary, [zkun@panparks.org](mailto:zkun@panparks.org)

PAN Parks Foundation (PPF), the European wilderness protection organisation, has recently published *The Economics of Wilderness* (Houdet & Kun 2011). This publication was desirable to develop a better understanding of the economic benefits and costs of wilderness areas to European stakeholders. Indeed, while *The Economics of Ecosystems and Biodiversity* (TEEB 2010) reports have successfully mainstreamed concepts such as the economic values of nature and the need for payments for ecosystem services (PES) to support effective protected area (PA) management, tangible mechanisms and tools are needed by PA managers to help them engage with stakeholders to accomplish ecological and financial stability.

Due to the economic crisis governments are cutting their financial contribution to PAs, managers have to look for new, innovative schemes to guarantee protection of wilderness. The managers though face with the great challenge in relation to implementing PES schemes, because the services of wilderness areas in principle are limited to non-extractive use or non-direct use values. Therefore tourism as a non-extractive industry is one of the potential activities, which – if planned with care – can provide income to local communities and generate funding to enhance protection of wilderness PAs.

## Developing wilderness policy in Europe

Wilderness protection is a natural phenomenon globally, but it is relatively a new concept in Europe. Nonetheless, there have recently been several policy successes with respect to the protection of Europe's last remaining wilderness areas. A special report on wilderness was adopted in 2009 by a huge majority of the European Parliament. This notably led to the development of an Agenda for Europe's Wilderness and Wild Areas, outlining 24 tangible recommendations. The NGO community then formed a Wilderness Working Group (WWG) in August 2010 to develop a wilderness definition to clarify the interpretation of wilderness in a multicultural continent and prepare a set of criteria for a wilderness register applicable throughout Europe. The WWG finalised this process in April 2012 and agreed that: *Wilderness areas are large unmodified or only slightly modified natural areas, governed by natural processes, without human intervention, infrastructure or permanent habitation, which should be protected and overseen so as to preserve their natural condition and to offer people the opportunity to experience the spiritual quality of nature.* The WWG also set up the minimum size requirement for protected areas being recognised as wilderness at 3,000 hectares.

A presentation of the European Commission representative at a wilderness conference in Brussels in 31 January, suggested that 13% of the Natura 2000 (N2000) network is

managed to protect wilderness attributes. The primary aim of the N2000 network is to guarantee long-term survival of Europe's most valuable and threatened species and habitats. However the comparative mapping analysis of N2000 network and the CDDA database of PAs concluded that wilderness areas may cover only around 4% of N2000. This confusion regarding wilderness coverage in Europe clearly underlines our lack of accurate information and constitutes a real barrier to enhancing European wilderness protection. This in fact highlights why the Message from Prague included clear recommendations to improve the scientific background for wilderness protection in Europe, including mapping of wilderness and linking the societal benefits to wilderness protection. For the sake of this abstract the statement from the European Parliament report is used that only 1% of Europe's land territory remained wilderness.

## Tourism benefitting wilderness protection

PPF felt particularly important to highlight why and how tourism as a funding and awareness raising tool might be used in the context of wilderness protected areas in Europe.

But is wilderness a priceless heritage for future generations? Unfortunately it looks as Europeans are not valuing wilderness as much as they should. In addition to their intrinsic spiritual, landscape and biodiversity value, wilderness areas offers benefits for landholders, farmers, communities and society in general. These can be derived through traditional activities such as nature tourism, bringing income and employment. The PAN Parks Tourism Model was introduced 3 years ago in order to link local providers, incoming and international tourism operators for the sake of enhancing the protection of wilderness in Europe.

The tourism model has three major objectives:

1. increasing the income of local communities through a non-extractive activity
2. improving the knowledge of visitors about wilderness in Europe
3. generating non-restricted funding for wilderness PAs as tourism packages include a 30 EUR donation to PAN Parks Foundation

Above all PPF uses its tourism model as one of the tools to implement The Million Project aiming to protect 1 million hectares of wilderness in Europe by 2015 ([www.panparks.org/what-we-do/the-million-project](http://www.panparks.org/what-we-do/the-million-project)).

The best example of the tourism model is the Finnish Wilderness Week, which is a packaged linked to Oulanka PAN Park (PP) and designed by local provider, Basecamp Oulanka. This package is sold by Exodus as international operator on the UK market. On average it generated 250 visitors a year and resulted in roughly 23,000 EUR for pro-



Figure 1. The PAN Parks Tourism Model links local providers, incoming operators, PAN Parks and international operators

jects within the network of PAN Parks. This funding was used in 4 different PAN Parks for the following projects: a) improving the visitor centre of Retezat PP, b) opening a new eco-trail in Rila PP, c) displaying new information boards for visitors in Borjomi PP and d) starting a photo documentary project in Majella PP.

## Conclusions

The original projection of the annual income from the tourism model was 300,000 EUR. However after 3 years PPF managed to make a more realistic plan and set a simple goal for the tourism model: to build an effective and mutually beneficial cooperation between PPF and Tourism Businesses in order to allow businesses and their clients to support wilderness protection while clients can experience wilderness and the business can profit.

The implementation of tourism model requires the following:

1. at least 10 destinations where the destination management and marketing are in one hand;
2. at least 4 different types of product: package tours, special interest tours, self-guided tours, and corporate adventures;
3. quality check of local businesses should include environmental and client service elements.

If these are implemented the tourism model can generate 150,000 EUR annually which might be an unrestricted new income for protected areas and a good example of PES.

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ORGANIZED SESSION: ORAL/PANEL

## Outdoor recreation demand trends and prognosis in the Nordic Countries

Session organizer: **Tuija Sievänen**, Finnish Forest Research Institute, [tuija.sievanen@metla.fi](mailto:tuija.sievanen@metla.fi)

The aim of the session is to discuss and to assess what we know about outdoor recreation demand trends in Nordic countries, and what type of information there is already available. Second, the session deals with methods for outdoor recreation monitoring, and evaluates possibilities for comparisons across Nordic countries in terms of outdoor recreation data and statistics, which are the basis to develop trends and reliable prognosis of outdoor recreation demand in the future. The focus is to compare the current state of knowledge in different countries, and to discuss further steps to improve the information and understanding of outdoor recreation in Nordic countries in the future. This session will offer four presentations – One from each country (Finland, Denmark, Norway and Sweden) – and the session will end with a follow-up panel discussion about what could be the further steps to develop better North European cooperation in outdoor recreation monitoring to improve the information basis for trends and prognosis. The challenge is to provide knowledge-based tools for government and municipality agencies, which are responsible for management and planning of public outdoor recreation services, as well as for the nature-based tourism industry, which generates jobs and income, and for other outdoor recreation organizations, NGOs and decision makers of policy and natural resources for outdoor recreation. Session participants are invited to participate in the discussion.

# Monitoring outdoor recreation trends in Finland

Tuija Sievänen, Finnish Forest Research Institute, Finland, tuija.sievenen@metla.fi

## Background and objectives

In Finland, systematic monitoring of outdoor recreation trends started relatively late, at the end of 1990s. The Finnish Forest Research Institute (Metla) initiated the first large population survey on outdoor recreation in 1997. Now the national outdoor recreation demand inventory (LVVI) has been conducted twice, in 1998–2000 and 2009–2010 (Sievänen 2001, Sievänen and Neuvonen 2011). The aim of the national recreation monitoring studies are to produce comprehensive, up-to-date information on outdoor recreation demand, to monitor changes in outdoor recreation, and to measure the demand for natural resources for recreational purposes.

## Methodology of national outdoor recreation demand inventory

The methodologies of the two nationwide population surveys (LVVI), both in their data collection and statistical calculations, have been designed to produce comparable demand information over time. The survey questionnaires have been designed carefully to sustain comparability, and all measurements of the key issues are kept the same. Some alterations were necessary, however, mainly because of the changes in the overall survey environment and because of the need to keep expenses reasonable.

The principal method is a survey with a large sample of 15–74 years old Finns. The first LVVI collected data by telephone interview and mail questionnaire, and the data collection was conducted over 24 months with a subsample every second month covering all months of the year. The data amounted to 10,600 responses in total. The second LVVI data collection also covered two years, but this time the data was collected in six subsamples, twice in winter, twice in spring-summer and twice in the autumn. The data consists of 8,895 responses in total. Data for both surveys were collected by Statistics Finland.

In both studies, a careful examination of the representativeness of the data was made with the help of validation surveys and the use of weights in calculations for statistics.

## Outdoor recreation trends

In Finland, there is trend information on a large number of issues concerning outdoor recreation (Neuvonen and Sievänen 2011): participation rates and frequencies for 86 recreation activities, characteristics of close-to-home recreation occasions and nature trips, the use of different types of recreation area, and so on. Overall participation in outdoor recreation has not changed much in ten years. One remarkable change is that the oldest age group, people aged between 65–74, is now participating more actively in outdoor recreation than the same group did ten years ago. The number of visits to nature has slightly increased, too. Now people have a larger variety of outdoor activities in which they participate compared to ten years ago. Many

changes have taken place concerning the popularity of different activities. Participation has increased in activities such as running (participation rate 31%), spending time at the recreation home (65%), boating (49%), gathering and chopping small wood (42%), forest work in leisure time (16%) and camping in back country (13%). A strong increase has been seen in bird watching (22%) and other types of nature study activities. The biggest relative growth concerns long-distance skating and snowshoeing, as well as Nordic walking and geocaching as new activities. Only a few activities such as fishing and roller boarding are seeing a decreasing participation rate.

In most cases, the annual number of occasions that people participate in an outdoor activity has decreased. This may be caused by the fact that people now participate in more activities than they did ten years ago. On average, every Finn participates in 13 outdoor activities; this number was 11 a decade ago. What is interesting is that there are now more young people who have berry and mushroom picking or hunting skills than there were ten years ago. In addition, 41% of the population have regular access to a recreation home, which significantly supports access to nature and offer opportunities for nature-based recreation. These trends suggest that outdoor recreation participation can be expected to retain its central role as a leisure activity in the future. Hence, it is important to provide some prospects to decision-makers and managers as to how outdoor recreation may change, reflecting the changes in population such as demography and socio-economic structure, and changes in the recreation environment, such as climate change, water quality or landscape structures in the countryside.

## Reporting

The main outputs of the LVVI studies are Outdoor Recreation Statistics 2000 and 2010, which include a wide array of information of participation in outdoor recreation by different population groups, descriptions of recreation occasions and nature trips, and information on disposable personal recreation resources such as ownership of equipment or skill capacity. In addition, comparisons of the changes in outdoor recreation over the last ten years are compiled in a report (Sievänen and Neuvonen 2011).

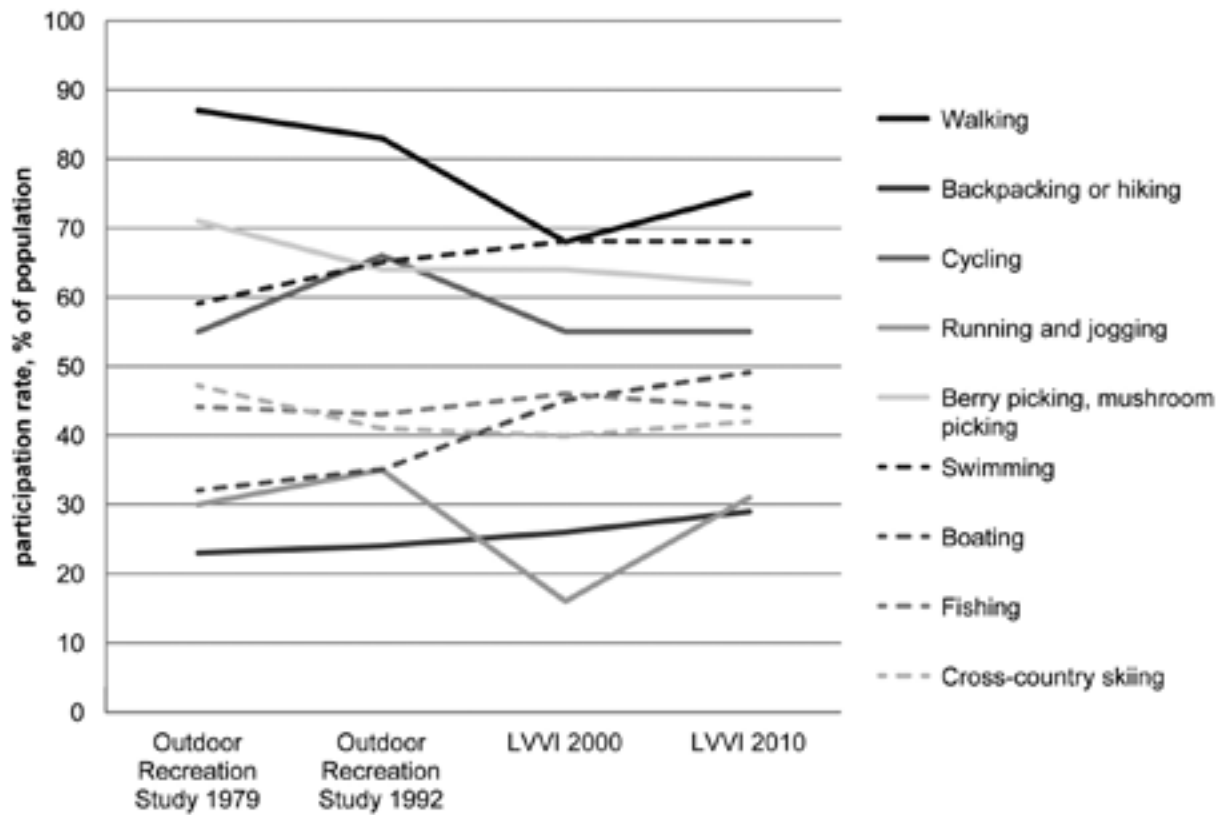


Figure 1. Long-term trends of participation rates of selected outdoor recreation activities in Finland.

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# Monitoring outdoor recreation trends in Denmark

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## Introduction

The importance of forests for outdoor recreation is being increasingly emphasized in Danish policy and administration, inclusive of a recent policy report on the future for the Danish forestry sector, and the National Forest Programme which takes up the need of monitoring.

Three national forest recreation surveys have been completed in Denmark. Data are gathered by postal questionnaires in 1976/77, 1993/94 and 2007/08 using the exact same methodology which makes establishing of trends possible. For representative purposes (and minimizing recall errors) the mailing of the questionnaires was distributed over a period of one year. A systematic gross random sample consisting of respectively 3,087, 2,916 and 2,000 persons was drawn from the Civil Registration System, representing the adult Danish population, 15–78 years. Up to three reminders was mailed, and the response percentage was 91.4%, 83.7% and 65.6% respectively.

## Selected trends and discussion

### *Number of visits*

An increase in the number of forest visits by 15% from the 1970s to the 1990s has been detected, followed by a slight decrease of 5–10% from the 1990s to 2008. A disadvantage of collecting information via questionnaires is the risk of exaggeration by respondents. On the basis of actual measurements made in several hundred forested areas it has been possible to estimate an exaggeration factor. This factor has conservatively been set to 2 for answering questions about the annual number of forest visits. Thus, the total number of annual forest visits made in 2008 by the adult Danish public was estimated at approximately 70 million.

### *Duration of forest visits*

Over the period 1977–1994–2008 there was a significant shift towards shorter forest visits. In 1977 just under 50% of forest visitors spent an hour or less in the forest on their visits; in 1994 the figure was almost 60% and in 2008 it was slightly over. The average duration of a visit was 1.9 hour, with a median value of 1.6 hour in 1977; these figures dropped to 1.6 and 1.2 hour, respectively, by 2008. – Is this an indication of a faster lifestyle? Is it conceivable that while the struggle to retain leisure time may well be intensifying, people are not willing to do without their trips to the forest, and so the duration of their visits becomes shorter?

### *Group size on forest visits*

The most frequent size for groups of forest visitors was two people in all three study years. All three surveys reveal that approx. 80% of forest visitors were in groups of four or fewer, but with a striking displacement towards groups of one: The number of single forest visits has almost doubled from 1977 to 2008 – 13% to 24% (Fig. 1). The tendency

towards more small groups rather than medium-sized (family) groups of three to six people might accord well with the general development of the Danish society towards more “individual” lifestyles, families having fewer children, children live at home for fewer years, and in general, more and more people are living alone. According to Statistics Denmark, 39% of the households now consist of a single person – an increase by more than 33 percentage points over the last 20 years.

### *Activities during the forest visits*

There have been no striking changes in forest recreation activities over the past 30 years or so – the most significant change from 1994 to 2008 is the increase in the use of the forest for physical exercise from 14 to 22% – “the forest as fitness centre”. As regards comparability between the studies, it should be noted that the response options for activities had been extended successively since the earliest questionnaire. These additional activity-categories presumably influence the frequency of responses for a number of the original activities. For example, the ascertained drop of 5–6 percentage points in the activity “Other” between each study (20/14/9%) illustrates this possible bias.

### *Travelling to the forest*

After a significant decrease in travelling time and distance from 1977 to 1994, these figures have now stabilized at 29 minutes and 8 km on average in 2008. In the period the means of transportation to the forest also has changed in the direction of more visitors walking or cycling to the forest compared with the use of cars – in 2008 almost as many was walking/running to the forest as using the car (40/42%). There is a clear connection between the results for travelling time, travelling distance and means of transportation to the forest – results that indicates growing pressure on urban forests. The fact that the car is now used less than previously could indicate that motoring is perhaps less of an attraction in itself than it used to be in the early 1970s.

## Conclusions

Over a period of three decades where leisure options have constantly increased, forests have been able to strengthen/hold their position as a very significant recreation venue – 88% of the adult Danish population visit the forest a year.

For the future planning and management, it is important to be aware of the demonstrated trends. Is it e.g. relevant to continue establishing relatively large parking lots – is there a need for more exercise structures and possibilities for shorter round trips in the forest – should there be (further) focus on local afforestation projects where outdoor recreation is in focus?

To be able to keep track of changes it is highly relevant to utilize new possibilities of data collection which might



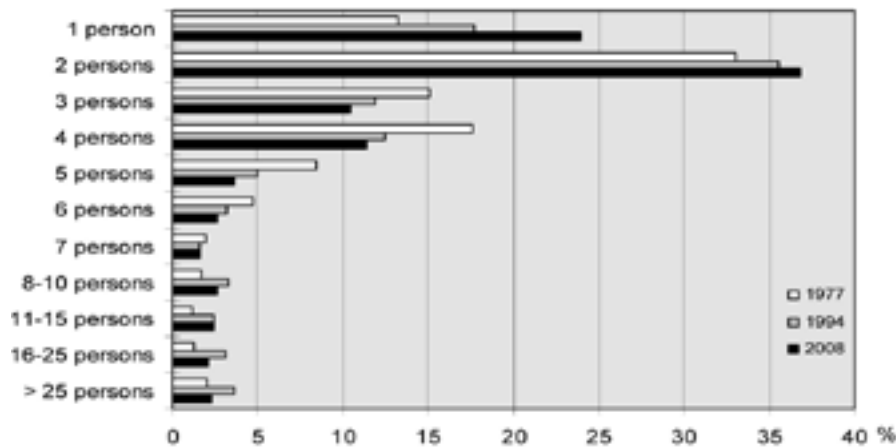


Figure 1. Distribution of group size during forest visits in Denmark 1977, 1994 and 2008 ( $p < 0.0001$ ).

give new and different input. In Denmark a relatively new attempt is to utilize the data collection taking place in connection with the mandatory Danish National Forest Inventory (NFI). This kind of data cannot handle visitor numbers and the like, but based on a 2006 trial inventory eleven social indicators have been included in the inventory from 2007 onward. The indicators include e.g. tracks, hunting facilities, vandalism and litter, which are seen as a valuable addition to keeping track of the trends.

# Monitoring outdoor recreation trends in Sweden

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**Anders Lindhagen**, Swedish University of Agricultural Sciences, Sweden; **Göran Nordström**, Statistics Sweden

## Introduction

This paper provides an overview of outdoor recreation trends in Sweden to facilitate a discussion on outdoor recreation demand and supply prognostics, potentials for cross-country comparisons and future data needs. The Nordic countries are globally well known for their outdoor recreation opportunities. Participation has historically been associated with the Nordic “friluftsliv” tradition, but more recently there are indications of changing recreation behaviors indicative of broader societal changes (Emmelin et al., 2010; Fredman, et al., 2012; Odden, 2008; Sandell et al., 2011). These include, e.g. more diverse participation patterns, less participation among youth, increasing demand for facilities, motors and adventurous activities, as well as growing socio-demographic differences. Fluctuations in participation rates reflects broader changes in society such as urbanization, globalization and technical developments, but also more specific factors like localized climate change, accessibility and resource management actions.

Data for this presentation include national statistics, regional and thematic population surveys and on site visitor monitoring studies. While such data are often not designed to provide guidance for determining micro-level supply needs, information on outdoor recreation participation is an important input to resource managers, recreation planners and market analysts. Since units of measurement and methodology are seldom harmonized, it is argued that an integrated data collection program, including different spatial levels, needs to be implemented in Sweden.

In December 2010 the Swedish parliament voted for the government bill ‘The Future of Outdoor Recreation’ (Swedish Government Bill 2009/10:238) followed by a process where measurable goals were developed. One conclusion from this work was a call for both scientific research and high quality data in order to implement and evaluate a policy serving the need of the general public. A program for outdoor recreation monitoring which address vertical integration through spatial aggregation including; a longitudinal national survey (with rotational thematic modules), oversampling of certain regions on a rotational basis, and on-site surveys on a local level has been proposed. This presentation is based on a chapter from a forthcoming publication by the Swedish Outdoor Recreation in Change research program, [www.friluftsforskning.se](http://www.friluftsforskning.se) (Fredman et al., 2013).

## Observations

The general trends observed from national data on outdoor recreation collected by Statistics Sweden are quite modest in terms of change (Table 1). The proportion of the population that reports hiking in a forest at least once a year has been within the 70–80% interval since the late 1970s. There is a small decrease in angling in the 2006/07 survey

compared with previous years, while physical exercise has increased from 46% in 1980/81 to 74% in 2010. Looking at visitation to the Swedish mountain region, which covers approximately one third of the land area, we find large increases in alpine skiing and snowmobiling, while more traditional activities such as hiking, backpacking and cross-country skiing have been quite stable comparing the early 1980s with the late 1990s. Although mountain tourism has increased in volume, we can observe a decrease in more frequent visitors, and the growth is primarily due to more winter tourism in the southern parts of the region. In forest recreation we identify overall small changes in participation between 1977 and 1997. Extending the view to 2011, there is a decrease in berry picking while picking mushrooms has increased in popularity more recently. Regarding hunting there are fewer hunters registered but more hunting days comparing the 1986/87 hunting season with the 2005/06 season. There has also been an increase in the hunting value over this period.

Considering trends observed from on-site studies we find some more pronounced changes. With one exception, there have been decreases in participation, primarily in urban proximate forest areas looking 20–30 years back in time. Forests in the proximity of Uppsala for example, a university town just north of Stockholm, feature more than 40% reduction in visitation during the last ten years. The exception, where a significant increase was observed, is Fulufjället National Park in the southern mountain region. This increase is a short term effect following from the designation of the National Park in 2002. Two general trends observed in several of the on-site studies are a decrease in the number of young people and an increase in physical activities. Visitors to more peripheral areas seem to have become more ‘urbanistic’, but are also increasingly looking for ‘adventures’.

## Concluding remarks

To our knowledge, the figures presented above represent the best available data on outdoor recreation trends in Sweden. So what are then the main trends and future prospects in this sector? Unfortunately, the answer to that question will to a large extent remain unanswered. It is obvious that official statistics indicate no dramatic changes the last 40 years when looking at the total population. We need to go beyond the total numbers, considering changes among specific demographic and socioeconomic groups to find the critical figures. We also need to consider the regional levels more carefully. Looking at the mountains, we find recreation increasingly becoming mechanized, but what happened to the backpackers and hikers? Maybe they are to be found elsewhere in the world, or substituted with international visitors not included in our survey designs, or perhaps they lost their interest to participate? With the same logic, pe-

Table I. Observed trends in outdoor recreation participation in Sweden

Study / Area	Method	Study period	Trends	Comments
<b>National population studies</b>				
Statistics Sweden	Personal interviews, from 2006 telephone interviews	1976*; 1980/81; 1982/83*; 1988/89; 1990-91*; 1998/97; 1998/99*; 2006/07*; 2008/09; 2010	No change, increase in physical exercise	Change in method
Swedish mountain tourism	Telephone interviews + mailed survey	1980-85; 1995-00	Increase in alpine skiing and snowmobiling. Small changes in hiking and XC skiing.	Less frequent visitors. Increase in southern mountain region.
Forest recreation	Mailed surveys	1977; 1997; 2011	Small changes 1977-97. Decreased berry picking, increased mushroom picking	Freq question changed 2011
Hunting	Mailed surveys	1986/87; 2005/06	Fewer registered hunters but more hunting days.	Increased hunting value. Small spatial changes.
<b>On-site studies</b>				
Norrbotten mountains (Laponia WHS)	Survey in huts	1980; 2003		Shorter visits. Older and more "urbanistic" visitors. More adventure.
Rogen, Långfjället Nature Reserve	Registration boxes + mailed survey	1988; 1998	Less hikers	Shorter visits.
Fulufjället National Park	Registration boxes + mailed survey	2001; 2003	Increase 40%	Designation effect. Shorter visits. Older visitors.
North Djurgården	Observations	1977; 1989; 1996	Decrease 35 %	Increase of children in groups
Bogesundslandet	Observations (cars)	1968/69; 1981; 2001	Decrease 30% or no change.	Increase weekdays, decrease weekends. Increase physical activities and golf.
Uppsala (Stadsskogen)	Observations	1988; 1995; 1999; 2007	Decrease 22 %	Increase children in groups
Uppsala (Vårdsåtraskogen)	Observations	1993; 1998; 2000; 2007	Decrease 44 %	Decrease children. Increase physical activity.
Uppsala (Näntunaskogen)	Observations	1997; 2007	Decrease 42 %	Decrease children. Increase physical activity.

\* Special focus on "leisure".

ople that previously used to recreate in the urban proximate forests may have displaced to the golf courses, ski slopes or theme parks. How do we understand and explain the paradox of increasing demand for both services and adventures in mountain recreation?

To answer such questions we need to go beyond single surveys and collect data much more systematic and comprehensive than previously has been the case in Sweden.

Data collected single years for longitudinal comparisons are sensitive to annual fluctuations and extremes. The framing of questions often changes from one survey to the next. Decreasing response rates over time is yet another methodological problem. And how can we take advantage of new technology in visitor monitoring? These are among the topics to be discussed in this presentation.

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# Trends in picking of wild berries and mushrooms in Sweden 1977–2011

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## Introduction

The habits of picking berries and mushrooms among Swedish citizens have been studied in three similar postal inquiries conducted in 1977, 1997 and 2011. This abstract reports preliminary results.

A rapid urbanization occurred between 1900 and 1970 in Sweden and most of the former rural population moved into more densely built-up areas. In 1970 about 80 % of the population lived in densely built-up areas. After 1970 the urbanization have continued but more slowly and in 2011 about 85 % of the population lived in densely built-up areas (Statistics Sweden 2012). During this period larger cities grew while the population of smaller municipalities and rural areas shrank and grew older.

The aim of this study is to describe and analyze the trends in berry picking and mushrooming in this changing society.

## Method

During all three years of investigation postal inquiries were sent to a representative sample of the adult (15–75 years of age) Swedish population late in autumn after the main berry picking and mushrooming season. Two reminders were used.

In the latest study (2011) an extra sample of respondents was made in three rural communities in different parts of Sweden to provide an opportunity to study differences between rural and urban areas. Quantities of berries and mushrooms gathered to be consumed in the own household were estimated by the respondents. The picking of four species of wild berries, Blueberries (*Vaccinium myrtillus*), Lingonberries (*Vaccinium vitis-idaea*), Raspberries (*Rubus idaeus*) and Cloudberries (*Rubus chamaemorus*) were measured separately. No differentiation between different species of mushrooms was made.

In the latest investigation (2011) more qualitative open questions were added to increase the possibility to explain changes in berry picking and mushrooming habits. In the open questions the respondents were asked to share some memories from berry picking or mushrooming during their childhood and to describe why they found berry picking and mushrooming important or less important.

The response rate has decreased from 82 % in 1977 to about 53 % in 1997 and 2011. The answering population was compared with background data of the whole population according to age, sex, family economy and if they live in a rural or urban environment. The non-response was in the latest study considerably higher among the youngest group of respondents. The response rate was also slightly higher among women and people with higher education.

## Results

The proportion of the respondents who have picked wild berries to be consumed in the own household decreased from about 64 % in 1977 to 40 % in 1997 and 42 % in 2011. For Mushrooming we can see an opposite trend where the proportion of respondents gathering mushrooms has increased from about 38 % in 1977 and 1997 to about 53 % in 2011.

The amounts of wild berries picked to be consumed in the own household had in 1997 decreased to about ¼ of the amounts picked in 1977 (Figure 1). The relative decrease is very similar for all four species of berries. Concerning mushrooming the amounts picked was slightly lower in 1997 compared to 1977 but in 2011 the amounts picked were more than twice compared to the earlier studies.

## Discussion

The high non-response, especially among the youngest respondents, has probably affected the results in the latest study. Picking of berries and mushrooms is less common in groups with high non-response and it is likely that the actual decrease in berry picking is even larger than showed in this abstract. For the same reason it is likely that the actual increase in mushrooming is smaller than showed in our results.

The mushrooming season in 2011 was for most parts of Sweden reported as very good and due to the late arrival of the winter even longer than normal. The increase in mushrooming in 2011 compared with the earlier studies might be a reflection of annual variation.

Theoretically the empirical differences we have found can be understood as reflecting changing ways of life related to societal changes and changing socialization processes according to both structural conditions (lifemodes) and individual choices (lifestyles). During the 20<sup>th</sup> century berry picking as an activity has transformed from being an activity seen as an extra economic resource base in a rural farming society, into a modern context of spare time and landscapes of experiences as part of an urban consumer society. For some respondents their attitudes to berry picking are marked by those changes. “I got tired of picking berries and mushrooms in my childhood when this was necessary and obliged to our domestic economy”. “I can buy this at ICA”. Others are more positive: “Wonderful feeling to pick in the middle of nature and then make lingonberry jam”. For many people berry picking can be seen as a symbolic enactment with nature, but especially older people in the country side still continue to practice berry picking on a larger scale. Mushroom picking can be interpreted as belonging to urban lifestyles, where forests and nature can afford a particular setting for recreation. Several respondents noted

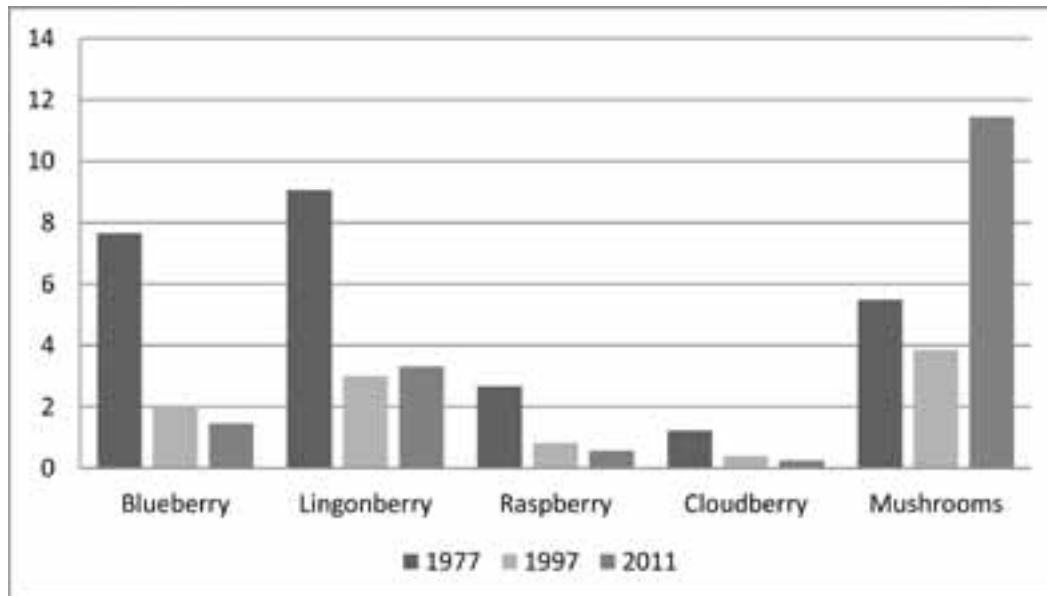


Figure 1. Mean values of the quantity of wild berries and mushrooms the respondents have gathered to be consumed in the own household during the last picking season. (estimated values in liters)

that they now prefer to pick mushrooms instead of berries, but an often expressed barrier to picking mushrooms is lack of knowledge. The social and cultural context of mushroom picking seems in particular to be urban middle class people. Our preliminary results are similar to those found in a Norwegian context (Odden 2008).

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## ORGANIZED SESSION: OUTDOOR WORKSHOP

# Outdoor learning in the context of landscape – Reflect, rethink and reform

Session organizer: **Anders Szczepanski**, National Centre for Outdoor Education ([www.liu.se/ikk/ncu](http://www.liu.se/ikk/ncu)), Linköping University, Sweden, [anders.szczepanski@liu.se](mailto:anders.szczepanski@liu.se)

In this outdoor workshop you will try to read the landscape its forms, patterns, colours and learning objects. If we talk about learning for a sustainable world one part of it is not to separate text based- and non-text based learning. We have to use the out-of-doors when we communicate the experience. It is essential in outdoor learning and teaching to focus on the place, object, process and the way of learning. It is also essential to reflect about the didactic questions: where, when, where and why. With a pedagogy based on sensory experience, learning would probably have a deeper approach. Direct physical contact with natural and cultural phenomena increases the authenticity in learning by providing a link to an approach that should reasonably be innate in human beings. We learn not only by seeing and hearing but also by smelling, feeling, tasting and touching; “to grip to grasp”, to use a metaphor for the distinctive character of outdoor education. We argue that in the authentic encounter with the outdoor environment there exists an important source of motivation for meaningful and creative learning processes.

- Outdoor education is an approach that aims to provide learning interplay between experience and reflection based on concrete experience in authentic situations.
- Outdoor learning is also an interdisciplinary research and education field, which involves, among other things: The learning space being moved out into life in society, the natural and cultural environment; the interplay between sensory experience and book-learning being emphasised; and the importance of place being underlined.

Outdoor learning is experienced as a place-related toolkit with opportunities to integrate different subjects and anchor teaching in the real world. This workshop is a cooperation with the Nordic Project “Frisk i naturen” because we think that all work for a healthy more movable generation comes out of this perspective and support healthy factors like outdoor learning and education. More information at: [www.friskinaturen.org](http://www.friskinaturen.org)

- Equipment: suitable shoes and clothes to be outside even if it is a rainy day.
- Outdoor Activity: You will work in nature with all your senses: taste, smell, motion and tactile experience in the Swedish landscape.
- Maximum: 20 participants

# Balancing conservation and visitation through a comprehensive monitoring system of nature protection in Estonia

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## Designing cross-country monitoring system

Estonia has partially practiced methods of visitor monitoring in forest areas, through a comprehensive and integrated visitor's monitoring programme of protected areas developed between 2009 and 2011. This study aims to design the conceptual framework for a national visitor monitoring system including the selection of a comprehensive indicator set and optimal monitoring network. The design and implementation of the monitoring system (i.e., its core and architecture) relied on the Nordic monitoring systems, drawing especially from the experiences in the Finnish Metsähallitus (Kajala et al, 2007; Sievänen et al, 2008). The Estonian monitoring system incorporates visitor counting, monitoring of carrying capacity and visitor survey. System operationalization applies regulations and criteria of nature tourism set in management plans of protected areas. In addition to maintaining ecosystem and recreational values, the monitoring system also articulates emerging current needs and demand for tourism services (Alexander 2008, Lockwood et al 2006).

Methods been tested in selected pilot and exemplar sample areas and have been adapted for use by conversation officers and nature rangers. The methods are also sensitive to difference in scale (e.g., protected area, regional, and national scale). Monitoring stations are identified according to the type of protected area, priority sites, visitation infrastructure, proximity to county centres, accessibility, visitation, holiday destination and outdoor events. Eco-Counter and TRAFx G3 Infrared Trail Counters were deployed and tested in developing the visitor counting module. Database output and reporting tools of this module consist of monthly and daily totals, time-of-day profile, day-of-week profile, and maximum visitation reports to investigate peak periods with critical load.

## System testing

The monitoring system is employed to tackle increasing nature tourist flows. In addition, the recreation infrastructure and facilities has been growing in protected areas. The list of priority monitoring areas comprised areas with extensive visitation as well as low visited areas across different ecological carrying capacities. Also, seasonality and weather aspects have been explored by various monitoring cycles. A management module, which operates within a conservation plan framework and shortlists precautionary and mitigation best practices, is presented as decision-tree. According to the mode of visitation, three types of protected areas are prescribed at decision-tree: very rare visitation area, partly de-concentrated visitation area, and strictly directed/chan-

nelled visitation area. Based on Wirth and Kaae (2010), restrictive, soft and facilitating management actions are applied depending on specific case as regular and urgent. Cases studies of the Vooremaa landscape reserve as an open access landscape and Emajõe Suursoo wetland reserve as restricted access area with entrance gates demonstrated the complexity and functionality of the visitor monitoring system, also possible bottlenecks of implementation became apparent in. In the case of Emajõe Suursoo, the Kantsi visitor centre is the most visited site (up to 200 visits daily during spring-summer), followed by two hiking trails (three gates for counting). The hunting and fishing visitor segments dominate during off-season months requiring different management and inspection mode.

## Setting standards for visitor management

The major principles and conditions for sustainable visitor's management in Estonian protected areas are as follows. First, the development of nature tourism infrastructure in distant areas or areas with low visitation is not recommended, but rather the further promotion of already developed areas. Second, protected areas should be monitored, evaluated and managed as a comprehensive unified system despite different managing authorities and an initial task should be to implement systematic visitor counting. Third, the visitor gates, which are not yet widely used in Estonia, should be established as a regular management tool. Fourth, marketing should be focused on target groups instead of done universally, and marketing should include a robust conservation message. Fifth, in the framework of comprehensive and general physical planning, evidence-based zoning for tourism and recreation needs to be introduced to mitigate increasing visitation impacts. In addition to the present zoning scheme of protected areas, a designated tourism zone is proposed for leaner, more straightforward management. As a missing link between conversation and visitation, a tourism and visitation standards and criteria should be assigned to protected areas. Benchmarking and improved management efficiency can be improved via tourism-adapted management plans.



Table I. Indicators of visitor monitoring

Module and category		Indicators
I	Visitor counting	3: annual visitation, weekly max, daily max, its trend
II	Impact on physical environment	3: importance of category, change of category, unplanned trails
	Impact of species and communities	2: Natura 2000 status class (A, B, C), status of indicator species
	Quality of infrastructure	1: status class
	Firewood and waste management	3: quantities, unplanned fireplaces, littering (location, mode)
III	Visitor survey	10: visitor features (age, sex, education, etc), activities, overnights, motives, expectations, satisfaction, expenditures, mode of transport, location of origin
	Entrepreneurs survey	2: accommodation units, employment

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Wirth, V. & Kaae, B. C. (2010). *Detailed Management Actions and Specific Solutions*. In: Pröbstl, U., Wirth, V., Elands, B., Bell, S. (Eds.), *Management of Recreation and Nature Based Tourism in European Forests*. Springer-Verlag, Berlin.

# Total annual visitor monitoring: A meta-analysis

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Aim of this work is to map recreational use of non-urban ecosystems spatially explicit EU-wide. Therefore, we develop a meta-analytic visitor arrival function by regression analysis. The model allows for predictions of annual visitors per hectare.

Primary data on the dependent variable were collected from visitor monitoring studies across the entire EU, mainly from northern Europe. In total, we analysed more than 51 studies, with over 200 samples. Explanatory variables of the model can be divided into (1) site characteristics, (2) context characteristics and (3) study characteristics. Site characteristics describe the site itself, such as land-cover and naturalness; context characteristics describe the spatial context of the site, such as the availability of substitutes and accessibility. They were derived from multiple biophysical and socioeconomic GIS-data, which were taken from existing data-sets or produced by processing these datasets. Study characteristics describe the methodology of primary data collection and may thereby account for impacts of different visitor counting methods on the visitor monitoring study result.

Preliminary regression results show more than 60% of explained variance, thus proving the possibility of mapping recreational use across different European countries based on primary data from multiple sources. Predominant explanatory variable is accessibility, describing how easy a site can be accessed by how many people. However, also site and other context characteristics play a considerable role for predicting visitors. Methodological variables do not correlate with final visitor estimates at a statistically significant level, but some study quality indicators do so with the residuals of the studies.

The work may contribute to identify best-practice methods for visitor monitoring. Furthermore, it allows for the identification of areas with high recreational importance and gives insights into the main drivers of recreational use. Thereby, it may give guidance for land-use and site management policies.

# A method of correcting over-reporting and under-reporting bias in monitoring state park visitation among the general population

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**Andrew Mowen**, The Pennsylvania State University, USA; **Deborah Kerstetter**, The Pennsylvania State University, USA

What proportion of the general population visits state parks and related areas? To what extent are people aware of the jurisdiction and management of areas they use for outdoor recreation? These are the questions leading to this study of Pennsylvania (USA) state park users. While measuring visitation of specific parks can be effectively accomplished through a variety of mechanical and on-site survey methods, it is more difficult to determine visitation rates for park systems among the general public. For example, the National Park Service Comprehensive Survey of the American Public (2008–2009) reported that 61% of sampled US residents said they had visited a US National Park System unit within the previous two years. This was considered an “un-validated self-report” measure of the rate of National Park visitation among the US population. To adjust for possible overstated actual visitation, only those who subsequently correctly named an official NPS site were considered “validated” recent visitors, resulting in an adjusted NPS visitation rate estimate of 46% of the American public.

This study examines such measurement issues in the context of the Pennsylvania State Park system. Respondents in two statewide resident surveys were asked if they had visited a Pennsylvania State Park within the previous year, and if so, to identify the park visited. As in the national study, a telephone survey was utilized to obtain data from non-users (or infrequent and past users) as well as recent users of Pennsylvania State Parks. Our surveys corrected for overstated visitation using a protocol similar to the national survey, but also examined under-reported visitation by asking respondents reporting no State Park visits to name other outdoor recreation areas they had visited and detecting official State Parks within their responses.

The first study used a statewide random sample of Pennsylvania residents. The majority of respondents (55%) said yes to the initial question, “have you visited a Pennsylvania state park in the last 12 months?” About three-fourths of those respondents then named an actual Pennsylvania state park they had visited, thus validating their initial response. About 5% said they did not know which park they had visited, leaving 20% naming other types of areas that were not Pennsylvania state parks. The most common other types of areas mentioned included national parks (e.g. Valley Forge, Gettysburg), national forests (e.g. Allegheny), other federal areas such as US Army Corps of Engineers reservoirs, other state lands such as state forests or Game Commission/Fish and Boat Commission areas, county or municipal parks, state parks in neighboring states, and private areas including amusement parks. Respondents listing such areas instead of a Pennsylvania State Park in the follow-up questions were converted to non-state park users.

Further questions probing previous state park visitation (e.g., “have you ever visited a state park in Pennsylvania”) showed that non-users of the state parks included those who had formerly visited a state park and those who had never visited a state park. Over two-thirds of the non-users (78%) were in the former user category. Those who reported never visiting a Pennsylvania state park were asked if they visited any other types of public parks within the state during the past 12 months. Most of these individuals stated they had not visited any public parks. However, some of these “non-users” named Pennsylvania state parks they had visited, thus contradicting their earlier answers indicating no visits to state parks. This question revealed a source of under-reporting of state park visitation, counteracting the adjustments for over-reporting discussed earlier. Extrapolating the data to the overall state population, we concluded that about 43% of Pennsylvania residents visited a state park during the previous year, 44% did not visit within the last year but had visited a state park at some time, and just 13% had never visited a Pennsylvania state park.

The second study used the same questioning protocol with a sample of Pennsylvania residents identified as having an interest in outdoor recreation. The purpose of this telephone survey was to assess public use of and preferences for state park concessions as well as strategies to expand outdoor recreation services and opportunities within Pennsylvania state parks. Thus, the sampling design focused on gaining access to state park users and outdoor enthusiasts, rather than representing the general public. A targeted random sample of Pennsylvanians with an interest in outdoor recreation was purchased from ICOM Solutions, a survey database supplier.

As expected, the proportion of the sample identified as being current state park users (66%) was higher than in the earlier study of the general population. The sources of over- and under-reporting state park visitation, however, were consistent with those in the earlier study. Similar proportions of respondents named other types of areas when questioned about what state parks they had visited. In this study, 6% of those who reported that they had never visited a Pennsylvania state park subsequently listed a Pennsylvania state park as a place they had visited within the previous 12 months.

Results from both surveys confirm the notion, generally held among park professionals and researchers alike, that many recreation visitors are unaware of the jurisdiction and management authority of the outdoor recreation areas they are using. Implications for management are discussed, and a revised protocol for estimating visitation rates among various types of populations is presented.

# Joined and online-based visitor monitoring and benchmarking

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**Katharina Meifert**, BTE Tourismus- und Regionalberatung, Germany

Detailed knowledge about visitors and their expectations is an important pre-condition for the monitoring and management of recreational and protected areas. Traditional methods used to gain information, such as face-to-face on-site surveys and counting systems are time-consuming and expensive. This paper presents an innovative approach for visitor monitoring, which integrates web-based survey technologies and at the same time allows just in time data analysis and benchmarking.

In the State of Brandenburg, in Germany, 15 visitor centers of Nature Parks, Biosphere Reserves and a National Park, which are state-owned or by NGO's, have come together to form a network. The main object was to create a substantive strategic networking through the establishment of common quality criteria, a mutual market presence, mutual products and an innovative joint visitor monitoring. The visitor centers are the main entrance-doors to the protected areas and are therefore the ideal location to carry on visitor monitoring. Visitor centers offer basic information to discover the area and they are starting point for individual and guided tours.

The specific idea of a joint monitoring system is to build up a shared survey with a common set of questions rather than establishing singular visitor surveys in the individual centers. In this way, the questionnaire consists of 70% of common questions that can be compared among the visitor centers. In addition, it is possible to integrate individual questions, which include the specific regional characteristics of the individual centers. This joint visitor survey offers the potential to establish a continuous data base and to compare the data of the different centers for benchmarking purposes. It allows to review the performance of the own centre, but also to find out how the latter is ranked in comparison with other centers.

The (monitoring) system is designed as an online survey based on the questfox©-software, in which all data are entered into one system. Therefor the survey operates without media discontinuities.

The survey can be carried out in different ways (face to face, in written form or computer-assisted), depending on the individual technical or personal equipment of the visitor centers. For this purpose a standardized paper questionnaire and a to a large extent identical online questionnaire were developed.

The survey questionnaire can be filled in by visitors in various ways:

- directly on touch-screen computers at the visitor centers. Where touch-screen computers are not yet available, paper questionnaires are used. The latter are typed in the online system later on by the visitor center staff.

- in their personal computer or their smartphone, by retrieving a web-link, which is written on a post-card available at the visitor centers.
- on the mutual visitor centers website, by selecting the visited center

Through differently generated links is possible to retrace, which was the most efficient survey tool.

The data analysis is possible at any time for any visitor center, according to pre-defined rights, because the survey is linked to an instant/live evaluation website. Moreover the data can be evaluated from all project participants without further knowledge of statistics or of the data collection and analysis software. Each visitor center has its own access and it can therefore retrieve only its own data. In the analysis section, several predefined reports are available and can be recalled. Through the website each visitor center can evaluate each question and compare them to all other participating centers anonymously.

The advantages of a joint and online-based survey are:

- comparability of the collected data (for benchmarking)
- a permanent and continuous all year-long data-collection and evaluation
- digital data collection without media discontinuities
- the usage of the different systems (e.g. touch-screen, personal computer) can be verified in order to measure the performance of each system
- low costs for the ongoing operation of servers and software after the initial implementation
- sustainability in terms of an long-lasting action (no use of paper on a long-term)
- corrections on the questionnaire are possible from a central server, moreover it is possible to include supplementary questions for temporary survey
- data collection also outside from the visitor centers
- no additional workload through the online survey for the participating institutions is necessary (data input directly into the computer)
- no specific computer performance is required (except for a fast Internet connection).

## Challenges

- different content focus of the project-partners, e.g. concerning mutual content in the questionnaire
- motivating visitors to answer the survey (time factor, sometimes fear of using computers e.g. for elderly people)
- transparency about the benefits and advantages of the joint survey, motivating the employees to carry on the survey continuously

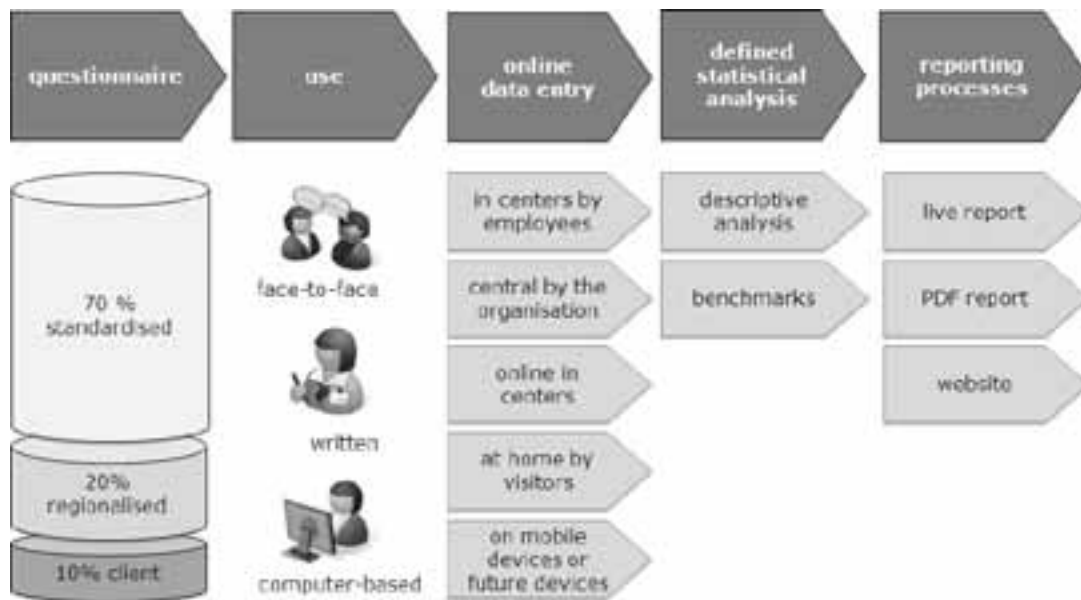


Figure 1. The visitor monitoring system at a glance

- partner's fear of the comparisons with other visitor centers
- find an agreement and observing mutual commitments among the partners
- too high expectations of the partners (e.g. in terms of number of interviews)
- partners' openness to criticism, same consideration of both positive and negative feedbacks
- stable, good internet connection
- Length of the survey questionnaire
- confusion between the different links during the data input of paper questionnaires.

In 2010, the system was already tested in detail and a total of 1.179 questionnaires were completed by the 10 initial visitor centers. The questionnaire was optimized again in 2011 and used for the first all year survey of 15 visitor centers. 1.240 full interviews could be generated. Also in 2012 the survey is being continued. The survey results from 2010 and 2011 indicate an overall high guests' satisfaction with the services of the visitor centers. Their suggestions, criticisms and compliments provided valuable information for the centers work. When asked what other centers and protected areas they know, the guests always mentioned two specific visitor centers. Other centers are less well known. This answer shows the potential that could be tapped th-

rough the centers network.

The survey also investigated socio-demographic data of the tourists and how they have heard about the centre and area. One result is, they visitors have come to know about the centre and the nature service by brochures / flyers and trough the recommendation of friends and relatives. The internet as an advertising tool had a minor relevance.

To sum up, the cooperation among the visitor centers and the use of a joint online-based monitoring system has generated several benefits. The contribution will present the joint system, summarize its challenges and explain the main advantages and success factors.

# Monitoring human use on trails in Canada's mountain national parks

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In 2007, social science data on backcountry day-use activity on trails was identified as an important data information gap for Banff, Jasper, Yoho, Kootenay, Mount Revelstoke, Glacier and Waterton Lakes national parks. This group of parks, collectively known as the mountain national parks, has approximately 3500 km of formal trails accessed by between 49% and 73% of park visitors (Ipsos Reid 2008, 2009). Data on levels and types of trail-use and profiles of this significant sector of the visiting population was insufficient to meet park management planning or State of the Park reporting requirements.

This information is also required due to a) Parks Canada's focus on connection to place and the link to authentic experiences, b) goals to attract target markets and c) recent visitation targets set for national parks. Researchers and wilderness managers must attempt to find a balance between potentially increasing use of wilderness areas and the effect of this use on the ecosystem. Specific to this research were requests for data to inform allocations of public safety, visitor experience and infrastructure reinvestment resources.

A two-pronged approach to research was developed; one prong addresses broader planning and reporting needs and long-term monitoring while the second prong addresses site-specific issues linked to public safety and infrastructure reinvestment. This presentation focuses on the methods employed and lessons learned to date and suggested improvements for the future.

## Methods

Since the summer of 2008, a multi-year strategy for quantitative and qualitative trail-based research has been employed in the mountain parks.

### Quantitative

Researchers employed 51 cameras and 113 infrared counters, 15 magnetic counters and 25 *Tracksticks* to capture information on levels and types of use on over 230 trails. Selected summer trails represented high, medium and low levels of use; the summer documentation period generally covered mid-May to mid-October. Cameras and counters were installed at least 150m from the trailhead.

*Tracksticks* GPS units provided information specific use patterns on trail networks and off trail activity in sensitive areas (i.e. sites for caribou reintroduction). The units were distributed at trail heads and collected from boxes where trail-users left them following their day out. Data was downloaded to maps, indicating where the trail-users had been that day.

Winter documentation generally occurred between mid-November and April 30<sup>th</sup>. Infrared counters equipped with lithium batteries were installed on cross country ski trails and at access points to backcountry and off-piste skiing and ice climbs. Site selection was based on popularity and ava-

lanche hazard rating; Glacier National Park, renowned for its backcountry skiing was specifically targeted.

Counters and cameras were checked and downloaded one week after installation and then every 1–2 months. Downloaded data was transferred to the central database in Banff. Photos were classified using *Reconyx Mapquest*, infrared and magnetic counter data was analyzed using *Trafx Reporter*. Use was reported on a monthly basis for annual reports; more precisely and ongoing for specific issues linked to wildlife–human interactions and compliance.

### Qualitative

Researchers surveyed over 4600 summer and 690 winter trail-users. Summer surveys were delivered in-person on trails. Winter was more challenging; on good weather days, surveys could be conducted at trailheads. Fortunately, surveying was more productive at avalanche awareness nights, onsite promo events and at the Rogers Pass Visitor Center where winter trail users are required to register before entering the backcountry.

Respondents provided demographic information, a list of their favorite park-based activities, sources of information on trails, how they chose trails and what they had learned during their visit to the park. Open-ended questions gave respondents a chance to discuss – in their own words – their expectations and experiences during their visit to the park.

Survey data was analyzed using SPSS, Microsoft Excel software and inductive content analysis of emergent categories.

## Lessons learned

Magnetic counters, used to record bike use, were unreliable when installed near train tracks or highways. They also record metal in horse shoes so were somewhat unreliable in remote areas.

Infrared counters record moving flora and fauna; in one case we had an 80% error rate due to grass blowing in the wind. Each counter needs to camera-calibrated for at least 2 weeks. On high use trails (1000+/day), set the counter to record hourly to avoid capacity issues. In very high use areas (2000+/per day) don't use any of this equipment (!)

Cameras discern types of use and collect wildlife and compliance information. However, the photos classification process is time consuming and, therefore, expensive. Using *Reconyx Mapquest* we developed categories for wildlife and human activities in a database accessible by science and enforcement staff. While this saves reclassifying photos to suit multiple needs, it does not mitigate the classification process.

*Tracksticks* exhibit a high error rate in canopy-forest; errors are usually extreme and easily identified.

During the winter, counters need to be constantly relo-

cated to compensate for changing snow levels and the fact that skiers break new trails that may no longer pass in front of the counter.

Based on parallel studies, we found significant differences between on-line and on-site survey results. In one case, online results indicated visitation was 91% Canadian and 3 % European compared to onsite results of 53% European and 33 % Canadian. Regardless, results from experience-based survey questions were similar.

### **In the future...**

Managers will be called upon to defend decisions and management actions and therefore must have scientifically reliability information. We need to test new technologies and stress minimizing the risk of lost or damaged data by employing trained and experienced personnel. A 'universally' agreed upon ethic for the use of cameras needs to be established. We need sufficient data to conduct power analysis for trends. With limited budgets we need to be flexible and work closer with universities to complete the multiyear strategy. Explore opportunities to collaborate with other protected areas agencies and institutions.

# An overview of national parks, recreational activities and visitor flows in Turkey

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## Introduction

Tourism is an important sector with a contribution to worldwide gross domestic product (GDP) estimated at about 5%. The rate of employment tourism provides is estimated at 6–7% of the overall number of jobs worldwide (in direct and indirect terms) (UNWTO 2012). Tourism can support the protection of natural resources when local residents realize the value of their assets and want to preserve these resources. Tourism can also help the sustainable management of protected areas as an alternative for the growing number of travellers who are looking for different experiences to enjoy the natural environment. It is now accepted that despite problems tourism often creates opportunities for protected areas, tourism should be supported if its negative impacts are under controlled (WWF, 2011). Therefore, visitor impact management is ever more important as the number of tourists increases, and their distribution is often concentrated in major tourism destinations in ecologically vulnerable areas (Aloisi, 2002).

In Turkey, natural and biodiversity-rich areas are protected by several different statuses such as national park, nature park, nature reserve, nature monument, wildlife reserve, specially protected area, biosphere reserve and Ramsar site. As a result of the diversity of protection statuses, protected areas are managed under different laws, regulations or international conventions and by different authorities. Currently, about 5.3% of Turkey's land area is protected mainly and these designations focus on forest, wetland and mountain habitats and include 40 national parks, 31 nature reserves, 180 nature parks 80 wildlife reserves, 14 specially protected areas, 13 Ramsar sites and 1 biosphere reserve (MoFWA 2012, Lise 2012, OECD 2008).

Most of these areas are recognized as tourism destinations in Turkey. Recently, the government has been encouraging ecological and cultural tourism in protected areas as a part of the National Tourism Strategy 2023 document in order to reduce pressure on the coastal environment and create alternative income resources for the least developed regions by diversifying tourism products and locations.

This study is focused on national parks which have an important place in Turkey's protected areas system. Designation of the national parks in Turkey began with the Law on Forest in 1956 and the first national forest park of Turkey (Yozgat National Forest Park) was established in 1958 in Anatolia. The current Law on National Parks was enacted in 1983 and defines four types of protected areas based on the types of characteristics to be preserved. Nature reserves are strictly protected areas for the protection of habitats of rare and endangered species and scientific and educational activities are allowed. National parks have great

scientific, scenic and cultural significance at national and international levels. Nature parks are natural areas of characteristic vegetation and fauna, in which recreational activities are allowed. Natural monuments are sites of scientific interest or with outstanding natural features (e.g. ancient trees, waterfalls) (OECD 2008).

National parks in Turkey have four zones: a central zone which is strictly protected, sensitive use zone with limited activities, sustainable use zone where certain activities compatible with the purpose of the park are authorised, and controlled use zone where tourism and recreational activities are allowed (MoFWA 2012, Lise et al. 2012). This multi-functional structure of national parks that includes both conservation of resource and opportunities for tourism and recreational activities is a research issue for the sustainable management of protected areas. In this context, this study aims to provide clues for understanding recreational uses of national parks in Turkey by focusing on trends of visitors in national parks.

## Methodology

The secondary data used in this research are exploratory. The data consist of official visitor records from the Ministry of Forestry and Water Affairs. Arrival patterns and number of visitors related to each of protected areas were obtained from these records that were kept by state officers between 2004 and 2011 at the entrance gates of each protected areas (including 176 different check points). The data were interpreted by applying frequency analysis. Although records were not kept regularly, they provide an opportunity to form some general conclusions.

## Implications

National parks are assessed according to visitor records. Results reveal that in many areas visitor records have been kept regularly since 2010. But there is no visitor record at 15% of the protected areas including 7 national parks, two historical national parks and 17 nature parks.

When current data are analyzed, national parks are the most visited protected areas in Turkey, and the most visited protected area is a winter sport centre, Uludağ National Park in Bursa Province. Uludağ National Park was visited by more than 5 million people between 2004 and 2011. This is probably because of its close location to Istanbul which is one of the biggest metropolitan areas in the world with a population of more than 15 million. Antalya's protected areas received the second highest number of visits with more than 3,5 million visitors between 2004 and 2011. Antalya is a coastal city on the Mediterranean Sea and a very popular destination for European and Russian



tourists during the summer season. The Taurus Mountains extend along the Mediterranean Sea and host various protected areas that are designated for the conservation of their natural features. These areas are highly visited by tourists. Çanakkale Province holds two important historical national parks that attract many national and international visitors every year. Troy Historical National Park and Gallipoli Historical National Park together drew more than 3,4 million visitors between 2004 and 2011. During the last two years, the most recorded arrival pattern was the individual visitor, followed by private vehicles, private minibus, student, -overnight stay, bus, minibus, motorcycle, tent, guided, caravan. Although these visitor records supply important information, the quality of the records might be controversial and should be improved for reliable analysis in the future.

## Conclusion

According to the results obtained in this study, it is possible to conclude that there are many opportunities for recreational and touristic use in the protected areas of Turkey and there are already various kinds of tourism activities such as

winter tourism, cultural tourism and mass tourism activities in the protected areas. One of the observations of this research is related to the legal regulations for protecting the natural areas. Unfortunately, these areas are not protected by one unified and comprehensive legislation but separate regulations which results in a difficulty in area management. Another observation about the current area management is that the visitor records for their arrival and the overnight stays are not kept regularly which makes it difficult to follow. However, it is crucial to have a regular visitor records to obtain the balance between recreational and touristic use and the protection of these areas, and without an effective area management it would not be possible neither to develop recreational and touristic activities nor to protect these naturally overwhelmed areas.

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# A method of carrying capacity for alternative recreation areas: Towards conservation thresholds and recreational potential

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## Introduction

Although Turkey is not a member of the European Union, the city of Istanbul won the award of “2010 European Capital of Culture” and more importantly has become a mega city model of 21<sup>st</sup> century (Birch, 2011). Becoming a megacity creates new opportunities but also carry new threats and risks.

The population of Turkey has shown an increase of 4.1 million in the last four years. In this process, Istanbul had the fastest growing population with a 8.5 % growth rate. Today, 18.2 % of Turkey’s population lives in Istanbul (Turkstat, 2012). By transforming the city into a highly populated metropolitan area, open space requirements have also increased. Due to lack of open space, inhabitants of the city head towards the forests in order to meet their recreational demands. 47.7 % of Istanbul is covered by forests. According to the forest management plan of The General Directorate of Forestry, the total forest area of Istanbul is 257,451,4 ha. and 13817,79 ha. of these forest areas are classified as existing and proposed recreational areas.

In accordance with present-day planning studies and daily visitor numbers that are set by the Ministry of Environment and Forest, it is observed that existing forest recreation areas are being damaged. Elements of pressure on forest areas as growing population, legal regulations and inappropriate-unrestrained recreational use increase the requirement of new recreational planning models.

Within the scope of this study, the aim is to analyze Azizpasa Forest with regard to natural resource protection. The study also identifies factors that have positive and negative impacts on recreation potentials of the area and to determine carrying capacities and usage priorities of these areas.

Azizpasa Forest is *located geographically* in the region of Thrace (the European part of Istanbul). This forest is spread over a major parcel of land (7398.7 hectare) which is surrounded by the Alibeyköy Dam Basin and the Bosphorus. The geographical alignment of the research area is 45°60’23” – 45°51’47” north latitude and 40°42’44” – 41°82’45” east longitude. Azizpasa Forest is one of the alternative areas to be opened for recreational use.

## Method

In the first stage, “The Conservation Thresholds Method Intended for Recreation” is established for identification and assesment of Istanbul-Azizpasa Forest’s restrictive natural resource values intended for recreation (water, soil and topografic structure). The main reason to use the “threshold” concept is the methodology identifies borders, limits and thresholds in land characteristics. (Pérez and Pérez, 2008). In the second stage, “Recreational Potential Ana-

lysis for Forest Lands in Urban Areas” is established for the determination and assesment of positive (vegetation and transportation) and negative (state of preservation, closeness to settlements and conservation areas) factors that affect recreational potential of the area. In the last stage, the outcomes of the first and second methods are compared. Distribution of areas are examined within different conservation threshold regions, as per the level of their recreational potential, From this analysis, priorities of the areas that will be open for use are determined. Depending upon the usage and conservation priorities, the usage density is selected and carrying capacity is calculated (figure 1). The synthesis of data relies on ArcGIS and Goal Programming (for calculating the carrying capacity) (Bekdemir, 2010).

### *Conservation thresholds method intended for recreation*

Composed data sets such as water resources (surface water, dam lake and dam basin), land resources (soil, land use capability classes) and topography (slope analysis) were evaluated as part of existing constraints. All data in each of these data sets were transferred to the assessment matrix of conservation thresholds. By obtaining the experts’ opinion and considering the main principles of environmental sustainability, a subjective scoring was done in the assesment matrix. All data were rated in 5 interval scale (less important to extremely strong importance).

The maps of mentioned data sets were overlaid using GIS and layer of total values was generated. A three-class Natural Breaks Classification method was applied to this new layer in order to determine the area’s conservation thresholds. Depending on these threshold values, natural resource characteristics were categorized into 3 groups named as areas with extremely strong, strong and less importance (Bekdemir, 2010).

### *Recreational potential analysis for forest lands in urban areas*

Three main data sets that affect recreational potential as positive factors (vegetation and transportation), negative factors (state of preservation, closeness to settlements and conservation areas) and conservation thresholds values were evaluated in this analysis.

These data sets contribution levels to Azizpasa Forest’s recreational potential were processed in a subjective scoring matrix. Contribution levels were rated in 5 interval scale (having very low to very high recreational potential) on the basis of previous recreational potential studies.

All layers were overlaid by using GIS. Layer of total values was generated and with the help of three-class Natu-

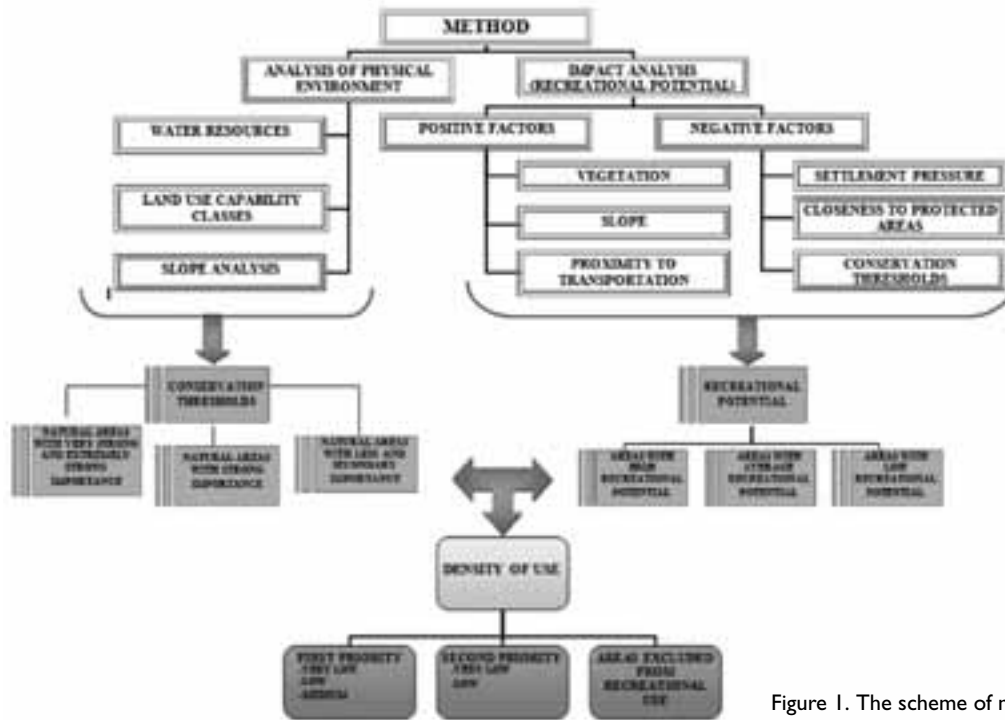


Figure 1. The scheme of method

ral Breaks classification method, forest area was categorized into 3 groups named as areas with low, average and high recreational potential (Bekdemir, 2010).

**Resource based on carrying capacity method**

Two new attribute classes named as THRESHOLD and REC\_POTENTIAL were created on the synthesis layer of the Recreational Potential Analysis map (including the Conservation Threshold values) by using GIS. To identify the areas that can be opened for use and for calculating their carrying capacities, queries are done between these attribute classes.

Areas with high recreational potential have the first priority to be opened for use. But the intensity of use varies depending on the conservation thresholds of the area. Areas with average recreational potential will have the second priority to be opened for use. Areas with low recreational potential are excluded from recreational use. Spatial distribution and proportion of the areas are calculated by their recreational potential within each priority region.

Our first goal in this planning model is to maintain the forest resource and its' structure; to ensure the sustainability and long-term function by low-density recreational use. Therefore the objective function can be written as;

$$\begin{aligned} \text{Minimize } Z &= d1+ + d2+ + d2- + d3- \\ &4X1 + 50X2 - (d1+ - d1-) = VSNA * 4 * (\% N) \\ &50Y1 + 300Y2 - (d2+ - d2-) = SNA * 50 * (\% N) \\ &300Z - (d3+ - d3-) = LNA * 300 * (\% N) \end{aligned}$$

VSNA: Area of planning in natural areas with extremely strong importance (ha.)  
 SNA: Area of planning in natural areas with strong importance (ha.)  
 LNA: Area of planning in areas with less and secondary importance (ha.)  
 % N: Distribution percentage of the planning area within the threshold region where it belongs.

Constraint values of our method's objective function were taken from the table of density of the use for recreational and nature-based activities according to Baud-Bovy and Lawson (2002).

**Conclusion**

In areas having first priority to be opened for use; carrying capacity for recreational areas stated by the Ministry of Environment and Forest should be reduced by %76.7 in natural areas with extremely strong importance and %75-%20 in natural areas with strong importance. It can be increased by %20 in natural areas with less and secondary importance. In areas having second priority it should be reduced by %75 in natural areas with extremely strong importance, % 84.5 in natural areas with strong importance and %75 in natural areas with less and secondary importance.

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# Positioning parks to meet the needs of 21<sup>st</sup> century society

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## Research focus

Most Australian national parks are managed by State governments and thus parks compete for attention with other government and non-government leisure and recreation providers and for funding with other government departments such as health, justice and education (Kaczynski, 2004). As a result, parks must establish and defend a market position through fostering positive images of the benefits they provide to visitors and society, which in turn will contribute to both stakeholder support and loyal visitors who re-visit and recommend parks to others. For parks, the attributes that make up a stakeholder's image are widely understood to be a function of the benefits that a stakeholder perceives those parks can offer.

The construct of positioning, drawn from the marketing literature, has come relatively late to public sector organisations, but is now acknowledged as potentially useful for the sustainable management of national parks. However, the positioning of parks is more complex than for other products and services and its application to park management has received relatively little attention. Poor market positioning, where there is a mismatch between a park agency's or an individual park's projected image and the image held by its stakeholders, can result in poor customer support. Closing this gap by re-positioning is key to societal and political support. Re-positioning, similar to its parent construct of positioning, has received minimal attention in park research. Additionally there is limited evidence of the efficacy of communication interventions to achieve re-positioning. By applying positioning in a park management context, this study contributes to testing and extending this and communication theories.

## Aim and methods

The aim of this paper is to describe the benefits of leisure and recreation in parks that their management agencies desire to project. The research reported in this paper is part of a broader research study that will additionally identify and analyse the gap (if one exists) between the image an agency desires to project and perceptions held by its stakeholders and then trial interventions to influence stakeholders' perceptions, with the objective of re-positioning the agency in their minds.

The attributes that agencies desire to project, that is their projected market position, were accessed through semi-structured interviews with senior managers from park management agencies in three Australian states: Parks Victoria, NSW National Parks and Wildlife Service and the WA Department of Environment and Conservation. The

interviews centred on identifying managers' perceptions of the benefits that each agency desires to project about visiting parks as well the broader benefits of parks to society. Nine senior staff from each of the three agencies (27 in total) were interviewed.

## Results

A list of personal or visitor benefits was derived from previous studies. During the interviews, the managers were asked to identify from this list the five benefits of leisure and recreation that each agency most desires to project (Fig. 1). The three agencies were similar in their desire to project experiences designed to attract visitors to parks (such as the opportunity to participate in outdoor activities), foster a connection with nature and encourage social interaction and inclusion (such as to socialise with friends and family). A notable difference was a focus by managers from WA DEC on projecting the benefits associated the preservation of biodiversity and associated ecosystem services, whereas Parks Victoria were more focused on projecting human health benefits.

Outcomes Focused Management (Anderson, Davenport, Leahy & Stein, 2008) was used as the lens to analyse and present the remainder of the interview results. OFM has emerged from a much broader body of knowledge on the benefits of leisure and recreation generally (Driver, 2008). It identifies four different types of benefits personal, economic, environmental and socio-cultural (Manning, 2009). Personal benefits are divided into the categories of psychological and psychophysiological and are much more focused on park visitors themselves. Economic, environmental and socio-cultural benefits relate to the broader community or societal benefits of parks, and are essential for repositioning (Crompton, 2008).

The personal (visitor) benefits that managers of all three agencies indicated a desire to project, obtained through a grounded theory analysis of the interview results, were classified using the definitions of benefits as stipulated in the OFM framework (1) the realisation of satisfying experiences and (2) improvements to desired; and the prevention of an undesired condition(s) (Driver, 2008). Satisfying experiences included the opportunity to access natural experiences; appreciate scenic beauty; be in a comfortable and safe place; challenge; escape the urban environment; experience something new and different; learn about nature, culture and heritage; participate in outdoor recreation activities; reflect on personal values; relax and unwind; seek enjoyment; and socialise with family and friends. Improvements and prevention included almost all of the benefits stipulated in the OFM framework (e.g. a connection to culture and heritage; connection to nature; increased self-confidence; and reduction in stress and anxiety).

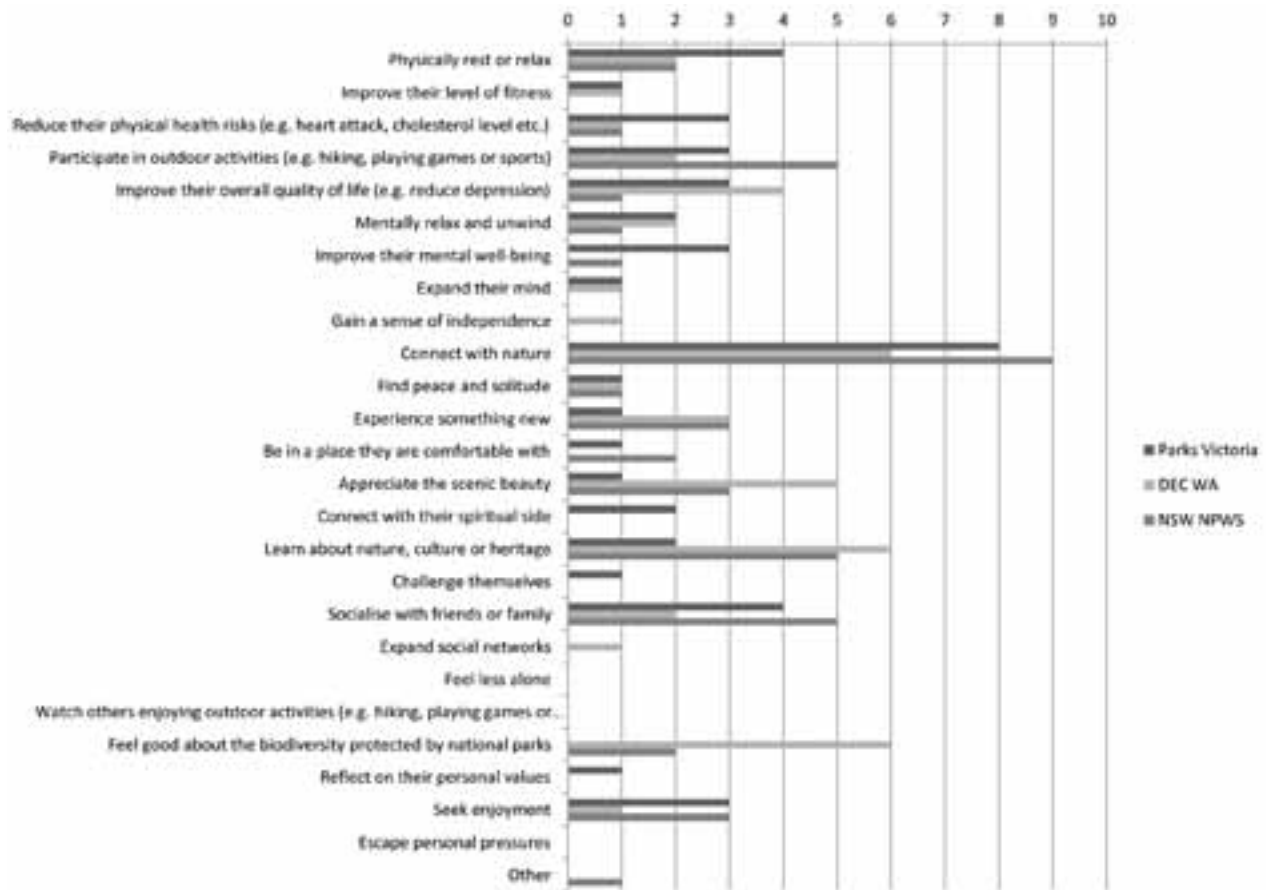


Figure 1. Personal/Visitor Benefits (Desire to Project)

Benefits may also be more broadly accrued by society (Crompton 2009). Analysis of the interviews revealed 12 broader, societal (economic, environmental and socio-cultural) benefits held in common by managers from the 3 agencies: the conservation of culture and heritage; generation of employment; healthier communities; improved flood and fire management; increased business and tourism investment; increased community wellbeing; increased sense of community; protection of biological diversity; provision of clean air and drinking water; provision of green spaces; reduction in the cost of healthcare; and reduction in the effects of climate change.

## Discussion and methodological implications/Reflections

Several methodological comments conclude this paper. First, the OFM approach/framework provides a promising

framework for describing the position projected and occupied by park agencies. Many park researchers and managers agree that benefits underpin the experiences of most park visitors even though they are notoriously difficult to describe and more difficult to manage for (McCool, Clark & Stankey, 2007).

Second, there are clearly benefits to individuals accrued through (1) visiting and (2) through wider societal benefits where visits may or may not be part of this benefits accrual. The next stage of this project will analyse both individual and societal benefits and examine positioning (and re-positioning) strategies using real, associative, psychological and competitive approaches (Crompton 2009).

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# Norwegian protected area policy, tourism and recreation: A comparative analysis of the international context with reference to New Zealand.

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**Odd Inge Vistad**, NINA; **Åshild Amundsen**, UMB; **Heidi Degnes-Ødemark**, UMB; **Debbie Hopkins**, University of Otago.

This paper reports on the preliminary stages of one part (Task D) of a programme of research funded by the Norway Research Council, titled '*Prospects for Managing Tourism Development in Protected Areas in a Period of Transition (PROTOUR)*'. This research programme sets out to analyse the potential for fostering and managing nature-based tourism development in and in association with Norwegian national parks. *PROTOUR* is organised into six key objectives, the fourth of which (Task D) seeks to position Norwegian protected area policies with regard to tourism and recreation in the international context. The initial phase of Task D entails a comparative analysis of protected area policies as it relates to tourism and recreation using New Zealand as a basis for comparison.

The first national park in Norway was established in 1962 and today national parks and other protected areas comprise 17 per cent of the land mass on the Norwegian mainland. The nature protection policy has thus been quite extensive over a short period of time but still little management attention has been given to the potential for nature based tourism. In the last decade political signals at the national level indicated growing support for tourism development in association with the national parks and management models and practices from other countries like New Zealand are thus seen as increasingly relevant to, and informative of the Norwegian context.

The management of the natural resource base in Norway, both within and outside protected areas, has historically been founded on the general principle of "common access" (*allemannsretten*), on which Norway's Outdoor Recreation Act (*Friluftsloven*) is based (Miljøverndepartementet 2007). The Act allows for unrestricted foot access to all in wilderness areas (areas which are not regarded as cultivated) such as national parks throughout the year. The principles of the *allemannsrett* are the foundation for mostly self-organised independent activities and visitor services are traditionally not seen as necessary in protected areas. Norway has typically upheld a tradition of limited facility development and commercial activities in its national parks (Haukeland & Lindberg, 2001). The Norwegian management system is therefore short of expertise in managing visitor needs and desires in the national parks, and there is a need to develop capacities to ensure the supportive handling of local tourism industry interests. Existing national park management plans are designed to clarify management rules and regulations for use of the parks, yet no visitor strategies are developed (Haukeland 2011). The majority of existing national park management plans make little or no reference to

tourism businesses (Heiberg, Hagen & Christensen 2006). In recent years there has been an increase in the budget for management of Norwegian national parks. So far, the majority of these resources has been allocated to the demanding processes associated with the launching of new national parks – the important question hereafter will be how the established national parks should be managed in practice (NTB, 2010). Insights based on international experiences and comparisons will hopefully be beneficial in this respect.

The New Zealand conservation policy context is selected for the purposes of this comparative analysis because the long-standing and generally successful association between tourism/recreation and conservation management in New Zealand. The *New Zealand Department of Tourism and Publicity* (NZTP), now *Tourism New Zealand* (TNZ), was established by the New Zealand government in 1901 – the first government agency responsible for international tourism promotion in the world. NZTP was established to promote the wonders of New Zealand's natural environment and to foster tourism, particularly from the 'Old Country' (England) and particularly to visit the developing National Park system that existed at that time. Today New Zealand's 'clean and green' image is an essential element of its attractiveness as an international tourism destination. That image is formalized through the highly successful global marketing campaign '*100% Pure New Zealand*' which has been the flagship of TNZ's marketing efforts for over a decade (initially launched in 1999). The '*100% Pure New Zealand*' brand is based primarily on perceptions of unpolluted rivers and lakes, and alpine wilderness which centre on an extensive system of protected conservation lands (which collectively represent over one third of New Zealand's land area) based on an extensive system of national parks (Higham & Maher, 2006; Hall et al. 1997).

Environmental administration in New Zealand was overhauled by the fourth Labour Government (1984–1990). One important part of the major reform to environmental administration at that time was the enactment of the *Conservation Act 1987* and the creation of the Department of Conservation (DOC) which came into existence on April 1, 1987. Since that date DOC has been the single and coordinated government department responsible for the management of the 'conservation estate' (PNAs) including all national parks. Under the *Conservation Act 1987* DOC is obliged to foster tourism and recreational use of heritage resources (Cahn & Cahn 1989) "*so far as it is consistent with the conservation of natural and cultural heritage*

values” (*Conservation Act 1987*). In addition, the management of reserves, forest parks and other state forests, wildlife and native plants, historic foreshores, seabeds, lakes and rivers, marine resources and marine mammals were from 1987 drawn together under the DOC umbrella (Molloy 1993; Hall & Higham, 2000). DOC was established on a four-tier structure consisting of Head Office (Wellington), eight regional offices, 34 district offices and numerous field centers (which provide critical coalface visitor services for tourists and recreationists alike). The New Zealand context, therefore, offers a comparative case that is unique in the longstanding and formalized relationship between tourism/recreation and conservation management.

This conference paper will provide an introduction to PROTOUR Task D. It will present initial comparisons (convergences and divergences) between the Norwegian

(basis of comparison) and New Zealand (subject of comparison) cases, highlighting the key elements/dimensions that will be the subjects of comparative analysis (1. Environment, society and economy; 2. Conservation status and designations; 3. Conservation policy; 4. Public use of conservation areas (tourism/non-tourism); 5. Visitor services and facilities; 6. Key issues in tourism/recreation and conservation management). Methodological challenges and research design considerations will be reviewed before conclusions are drawn.

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# Assessing carrying capacity in protected areas trails: The Formosinho Trail – Arrábida Natural Park (Portugal)

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## Introduction

The Arrábida Natural Park (ANP) is a Portuguese protected area (PA) location within the Metropolitan Area of Lisbon, which has 2,5 million inhabitants. Because of the high quality of landscape, the park receives high recreational demand both during weekends and seasonally. The vulnerability of this area requires management to take proactive actions in order to anticipate the negative effects of recreational activities by estimating the carrying capacity (CC) of sites. Nowadays, the CC concept is a formal part of PAs management and since 1999 Portuguese law requires Nature Sport Charts (NSC) for all PAs to include a definition of CC for each *nature-based sport*. However, until now only two PAs have an approved NSC leading to a casuistry management of those areas under increasing pressure.

The model approach presented in this paper aims to contribute to the definition of CC in PAs trails and thus help develop NSC by setting the CC in the Formosinho trail using biophysical and social data. The Formosinho trail is one of the most popular trails within ANP since it crosses the Serra da Arrábida at its highest point (501 meters), and leads through some of the best examples of semi-evergreen woods that give the Arrábida Biogenetic Reserve its international status.

## Methods

The methodological approach was divided into four main stages as presented in Figure 1.

### Data collection

In the first stage, the study focused on data collection including 12 fieldwork visits to gather ecological information and assess cartographic elements at different times of day and at different times during the year.

### Survey analyses and landscape analyses

In order to characterize the visitors of the Formosinho trail and understand their perceptions, 75 questionnaires were completed during the period of May and July 2010. The results allowed researchers to evaluate the quality of visitors experience and main motivations as well as develop a general visitor profile. The survey also generated information regarding potential indicators of impact for recreation experience and related resource conditions. Furthermore, an analysis of the natural parameters of the trail (e.g., geology-lithology, physiography, flora, and indicators of impact) was also conducted.

### Synthesis

This stage involved a combination of biological and physical information in order to obtain a biophysical sensitivity,

which was displayed visually on a map. The biophysical sensitivity of a trail is the degree of vulnerability of physical and biological components of a landscape in relation to natural impacts and anthropogenic pressures (Ribeiro, et al., 2002). The sensitivity was determined by the assignment of different values (high, medium and low) for the classes defined for each parameter and subsequent overlay. A “high” value relates to the condition of high sensitivity of a particular resource and a “low” value relates to a lower sensitivity (i.e., greater potential capacity to support trail use without diminishing the resource quality and visitors experience).

The biological sensitivity was derived from trail width and vegetation sampling. This analysis enabled predictions of where damage to vegetation caused by hiking would likely appear along with the location of vegetation with high value ecological values.

The physical sensitivity was obtained from lithology, slope and trail surface measurements. Through this analysis it was possible to determine trail erosion and potential risk areas for erosion.

The interaction between physical and biological sensitivity determined the values of the biophysical sensitivity, indicating that the trail has high biophysical sensitivity (81.49%). The trail, based on its biophysical sensitivity and peculiarities, must be subject to certain proposals of management that gives priority to the safeguarding of resources and environmental restoration in cases of degradable situations.

### Proposal for carrying capacity of Formosinho Trail

The CC proposal was developed through the combination of different aspects: *safety*, *visitor's experiences*, and *biophysical sensitivity*.

It is important to ensure the safety of people when they hike on the trail. This is an important factor since the high degree of difficulty (3801.7 meters length and 22.8% average slope) combined with the trail erosion leads to an increased risk of injuries. Regarding the visitor's experience, 14% of visitors considered a group of 25 individuals excessive. This number should work as a guide for visitor experience quality since large groups can lead to ecological impacts on the trail and diminish the visit experience. Biophysical sensitivity was also considered in this analysis because the fragility of the trail is apparent (81.49% of the trail has high sensitivity).

The process described above resulted in a proposed carrying capacity for hiking groups of 4 to 20 visitors. When one considering that the trail trip takes in average of 4 hours, and that it is preferable that groups do not encounter each other, the resulting carrying capacity is three groups per day (12 hours) corresponding to a daily capacity of 12/60 people.



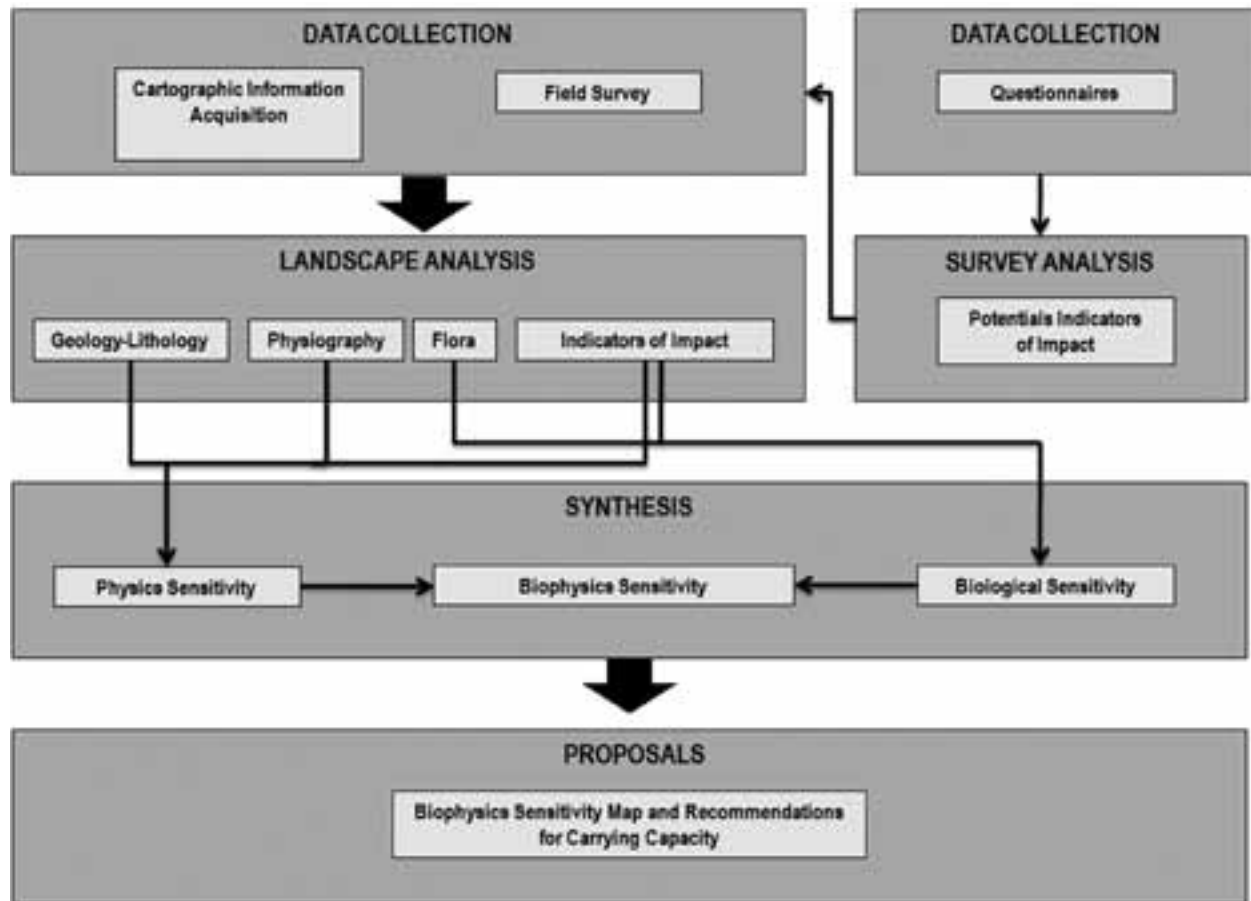


Figure 1. Schematic representation of the methodology

## Conclusion

The established ecological assessment and the social survey provide evidence of the current resource and social conditions at the Formosinho trail. This approach can be appropriate to other PAs in Portugal and assists in management decisions concerning the impacts of recreational demand. The CC model established for Formosinho trail does not aspire to be a universal formula but rather a contribution to improving current methodological approaches. This provides a basis for contributing significantly to management and conservation efforts with an objective methodology that is accurate and easy to apply. The approach must be carried out by multidisciplinary teams of specialized techni-

cians, taking into account how much and what kind of environmental damages were caused and what conditions visitors considered acceptable. Periodic reviews allowing changes within a social and ecological context should be carried out in order to update management actions. Thus it is possible to provide both protection of natural values and desirable recreational experiences for users.

# The use of wildlife overpasses for outdoor recreation

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## Introduction

In debates on combining outdoor recreation and nature conservation scientific knowledge is used to find solutions for problems. When knowledge is lacking ambiguity tends to prevail (Pouwels et al. 2011). Providing new knowledge can help the debate, but we noticed that stakeholders use this knowledge differently. In the Netherlands both the public and recreational interest groups intensify the pressure on the government to open up wildlife overpasses for recreational co-use. In 2009 two Members of Parliament requested the Dutch government to allow recreational co-use on wildlife overpasses unless the impact on wildlife was notably high. However managers of nature areas as well as national and provincial governments are often reluctant to approve these requests. Only few studies on the effectiveness of wildlife overpasses and recreational co-use have been conducted (f.e. Clevenger and Waltho 2003). In none of these studies the intensity of recreational co-use is as high as in the Netherlands; more than hundred visitors a day. The goal of our study was to provide this knowledge.

## Method

We selected two wildlife overpasses where human co-use is currently allowed; Zanderij Crailoo and Slabroek. The overpass in Zanderij Crailoo is 800 meters long and the width varies between 50 and 100 meters. The overpass crosses a provincial road and a railroad. In between the road and the railroad there is a small nature area. The vegetation on the overpass consist of dry grasslands, shrubs, small water bodies and some wet grassland types. On one side of the overpass there is a trail for horseback riders as well as a trail for both cyclists and hikers. These tracks are separated from the natural vegetation by shrubs and a small fence. The overpass Slabroek is considerably smaller, 100 meters in length and 15 meters wide. The overpass consists of dry and wet grassland types and there is one trail for horseback riders, cyclists and hikers. The use by humans was monitored by infrared counters (Trailmaster Active Trail Monitors TM1550). During the research some data were lost as the counters were vandalized with spray paint.

We monitored the use of the overpasses for mammals using sand pads (Ford et al. 2009). At Zanderij Crailoo four sand pads were constructed on the overpass itself and on both sides eight sand pads were randomly located as control plots within 1000 meters from the overpass. At Slabroek two sand pads were constructed on the overpass itself and twelve in the surroundings on both sides of the overpass. The sand pads were monitored almost daily between May 2008 and October 2009. When the tracks of for example one Roe deer on all pads on the wildlife overpass were directed from one side of the overpass to the other side, the

combined tracks were considered as one 'crossing'. For all other combinations of animal tracks we assumed animals had turned back and these tracks were considered as a 'visit'.

## Results

Based on the data from the infrared counters we estimated that during one year 180 000 hikers and cyclists used the overpass at Zanderij Crailoo and 1700 horseback riders. At Slabroek 60 000 hikers, cyclists and horseback riders used the overpass during one year. The use was highest on Sundays and in the spring and in the summer. Between 10 pm and 6 am there were hardly any visitors, while from 8 am until 6 pm there were visitors present at the overpass almost continuously. The use of the overpass by visitors outside the trails was low; at Slabroek almost 800 per year and at Zanderij Crailoo 150 per year. At Slabroek this use has led to degradation of the vegetation and resulted in a 'naturally' formed trail for horseback riders.

At Zanderij Crailoo tracks of 10 mammal species were found on the sand pads of the overpass and tracks of 9 species were found in the surroundings. At Slabroek tracks of 8 mammal species were found on the overpass and tracks of 9 species were found in the surroundings. At both sites tracks of Roe deer, Rabbit, Red fox, Hare, Hedgehog, European polecat, Pine marten, Red squirrel and Badger were found. At Zanderij Crailoo Roe deer and Rabbit were present every day and Red fox and Hare more than 75% of the days. At Slabroek Badger and Rabbit were present more than 75% of the days. Compared to other monitoring data from the Netherlands the use by Roe deer at Zanderij Crailoo is very high.

The results showed that crossing rates at Zanderij Crailoo were not necessarily less compared to overpasses without human co-use. However, overpass design seems important in this respect. At Slabroek a considerable number of species crossed less frequently compared to the control plots, which implies that they actively avoid the overpass. This difference might be a result of difference in width of the overpass or difference in design. Recreational co-use also affected the speed in which the animals passed and some species tended to use the overpass later in the day on busy days.

## Discussion and conclusions

Our results may help improve decision-making on recreational co-use of wildlife overpasses and provide some practical guidelines for the design of such crossing structures. Still our results cannot provide the needed certainty for policy makers to what extent wildlife overpasses can be used before the impact on wildlife becomes too high. In the Netherlands this has led to ongoing debates on recreational co-use of wildlife overpasses. Recreational stakeholders use

the results from this study to back up their statements that recreational co-use should be allowed, while nature conservationists emphasize that it is not proven there is no impact. Therefore, we recommend increasing the knowledge about impacts. We also recommend that nature conservationists and stakeholders of outdoor recreation collaborate in early planning stages and provide integrated plans for increasing road permeability to both humans and wildlife.

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# On the integration of nature conservation and outdoor recreation in the rural landscape

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## Challenges for the development of recreational features within landscape management and planning

Nature protection and outdoor recreation are factors affecting land use in many rural areas in contemporary Europe. This implies new perspectives on “landscape” and reveals a need to broaden the horizons when it comes to understanding problem complexes and seeking managerial solutions. Outdoor recreation and nature protection have been intertwined since the birth of nature conservation during the 19<sup>th</sup> century. Though some conflicting interests can be identified, these two aspects of land (and water) use have a lot in common in the fields of the history of ideas, spatial areas of interest, shared policy agendas and landscape quality demands (Mels, 1999). Over the past three decades, biodiversity has become a central objective within nature conservation. What implications do the strong commitment to enhancing biodiversity have for the contemporary relation between nature protection and outdoor recreation, and what challenges do they present for the development of recreational features within landscape management and planning? Sweden stands out as a country very active in the biodiversity preservation discourse. More recently, ambitions as regards outdoor recreation have been expressed in national policy strategies. This paper discusses the interface nature conservation – outdoor recreation and explores how outdoor recreation is considered and contextualized in contemporary nature conservation policies and strategies in Sweden. A content analysis of statutory documents has been conducted, and complemented by case studies of two developing nature conservation projects, the Kosterhavet national park and Kinnekulle, a Natura 2000 area and a biosphere reserve (Stenseke in press). The scientific approach is deconstructive, with the primary aim to expose preconceived perceptions and reveal underlying premises that need to be reflected (Castree & Brown 2001).

## More rhetoric than practice

Outdoor recreation is stated to be a cornerstone in nature conservation in Sweden, however, the results from this study indicate that it has not been established as a fully developed and integrated element of nature conservation policies. The phenomenon is vague and not adequately contextualised in policy documents. Furthermore, the case of Kosterhavet shows that scientific knowledge of human dimensions, such as activity patterns and preferences, is not necessarily utilised in major nature conservation projects in Sweden. While recreation is generally referred to as a central aspect of nature conservation policies and management in the nature conservation bill, it mainly exists in the rhetoric ambitions in the environmental quality documents, but is not considered in detail nor elaborated in strategies and managerial

discussions. The text analysis reveals inconsistencies, signalling that the understanding of outdoor recreation varies between sectors as well as between the people formulating the texts. Furthermore, it is to a large degree described as a problem. When outdoor recreation is mentioned in a more favourable light it is generally activities that adapt to the physical conditions in the landscape and make minor impacts upon the terrain. A similar pattern is recognisable in the Kosterhavet national park process: though notwithstanding the intention to enhance nature experiences, outdoor recreation is discussed more in terms of restrictions than possibilities, and there is an evident lack of knowledge and competence as for outdoor recreation.

## A more informed and reflected understanding is needed

The past two decades may justifiably be characterised as an era of biodiversity in Swedish nature conservation. The results of this study indicate that awareness and knowledge about recreational aspects have not progressed to the same degree. The reasons behind can be discussed in terms of (i) *attitudes among officials* – it seems still to be a well-established understanding among people working in the nature conservation sector, that nature conservation is about “nature”, thus keeping an ontological division between nature and culture. Nature’s intrinsic qualities and ecosystem functions serve as the point of departure in nature conservation management, and are keys in defining what is important knowledge, and what competence is needed. Consequently outdoor recreation is not recognised as an interest in itself with its own logic, but as an aspect of nature preservation; (ii) *the institutional structure* – the preconditions given in the administrative structure in nature conservation do not sufficiently support the integration of outdoor recreation. This integration must not be dependent on individual officials and managers, but rather enforced by formal and institutional settings. In the government bill 2010 on outdoor recreation, one aim is to increase knowledge on outdoor recreation. This study indicates that increased knowledge is not enough. For knowledge to be utilised there is a need for an institutional structure that guarantees that the insights are recognised and might be influential; (iii) *the dominant paradigm in nature conservation* – the results from this study promote a challenge to the present ecosystem approach. When introduced in nature conservation management, where there is an influential preconceived notion of nature as something beyond society, the ecosystem approach can be interpreted as postulating business as usual, just demanding a slight change in the sort of objectives that are formulated. Defining outdoor recreation as an ecosystem service might help us to consider the (economic) values of nature, but it is of little use for recognising the variety

of recreational demands, conflicts between various forms of outdoor recreation and between recreation and other societal interests. In order to improve the management of outdoor recreation aspects, they need to be considered in formal structures and better related to scientific knowledge. The results promote a challenge to the present paradigm of ecosystem approach, as it illustrates how the contextualisation of a social phenomenon as outdoor recreation is problematic in that perspective.

A conclusion from the study is that the development of a more informed understanding of outdoor recreation is necessary if appropriate strategies for meeting contemporary challenges of integrating recreation and nature protection are to be developed. This implies, though, not just a reflective understanding of outdoor recreation, but of the entire concept “nature conservation”, acknowledging the act of reinvention as Mels suggested (1999). A consideration of nature conservation as something that is about performing, rather than about preserving, will stimulate discussions on *what* should be performed, *why* and *for whom?*

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# An analysis of the visitors at the ASP World Tour Billabong Surfing Festival in Jeffrey's Bay, South Africa

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## Introduction

Jeffrey's Bay is located on the East Coast of South Africa, approximately 60 kilometres from Port Elizabeth which is the fifth largest city in South Africa (Figure 1). Jeffrey's Bay has a population of 15,000 and thus it is largely a rural settlement. Despite its rural setting, it is the only surf spot in the world that boasts with one of the best right hand point break waves in the world. It is this uniqueness that has made Jeffrey's Bay one of the most popular surfing destinations in the world.

The main purpose of this paper is to examine the profile of visitors (spectators) to the 2011 ASP World Tour-Billabong Pro Surfing competition in Jeffrey's Bay, South Africa. To date, no empirical study has been done of this event and little is known about the visitors to this event. Since this is a major sporting event on the international surfing calendar since 1981 and attracts surfers from all over the world, it is imperative that this event is further explored in terms of the significance of the visitors at this event.

## The South African policy frameworks

Within the South African context, the White Paper on the Development and Promotion of Tourism of 1996 emphasizes the development of products and activities, such as sport tourism and cultural activities, as this will broaden the tourism product base. This broadening of the tourism product base, should also contribute towards diversifying the tourism product. In doing so, it should speak to a wider audience base (visitors) as it presents a multitude of visitor experiences that could be constructed.

In the National Tourism Sector Strategy of 2011 reference is made of Business and Events Tourism. However the arranging of sport events, or festivals are not necessarily linked to the responsibility of provincial and local government. Such events, like the ASP World Tour-Billabong Pro Surfing competition in Jeffrey's Bay is the initiative of sporting bodies, with assistance from event management organizations and assistance from sponsors, which could be private sector, or public sector (government) sponsors. This would exclude mega-events where all tiers government would become involved, from the outset.

The Tourism Master Plan of the Eastern Cape Province recognises the Billabong Pro Surfing Festival as an established festival in the Province and a draw card for tourists to the region. It further argues that this event and many of the lesser known events are critical drivers to address seasonality in the Province. Since many of these event are hosted during the off-peak season, it does have a positive impact on addressing seasonality. However, very little insight into the event in terms of the tourists are provided, and it is not known what the collective impact of all the events are as there is no coordinated approach to determining the eco-

nomie, social and environmental impacts of all the events in the Province.

## The uniqueness and segmentation

According to Getz (2008), it is the uniqueness of the experience which attracts visitors. Thus each event has its own unique appeal which will speak to the visitors, based on the media activities that are engaged by the festival organizers.

Segmenting or profiling visitors is an important aspect of identifying who the visitors are. This will allow festival organizers the opportunity to determine who the customers are, which in turn will better assist with adopting specific marketing strategies to attract the type of visitors that is desired.

## Methodology

In order to address the main problem and objectives of the study, a quantitative approach was followed. The objectives to be addressed in this study:

- To determine the predominant gender of the visitors to the festival.
- To ascertain the age profiles of the visitors
- To calculate the average spend per visitor
- To determine the origin of the visitors and the mode or transportation used to an from the festival.
- To ascertain the length of stay at the festival and the accommodation preferences of the visitors to the festival
- To investigate the primary reason as why the festival is attended.

To obtain the required information about visitors to the Billabong surfing festival, a questionnaire was designed. Four fieldworkers randomly selected respondents during the period that the festival period when the surfing condition allowed for surfing. Great care was taken not to sample the same respondent on a different day and if a respondent had already provided information on a different day, or to another fieldworker, even though each field worker was restricted to a defined zone, then the respondent was automatically excluded.

The fieldwork took place during the second week of July 2011 when 'surf was up'. During this period that the festival took place, 350 questionnaires were completed. Of this number, 295 were satisfactorily completed and MS Excel was used for the analysis of the result.

## Results and discussion

The results of the survey revealed that females (55%) were the most dominant gender represented at the event. This was rather unusual as surfing in South Africa is a male do-



Figure 1. The location of Jeffrey's Bay

minated sport. However, it could be that females were attracted to the event by the predominantly male surfers.

The largest proportion of visitors was between the ages of 21–30. This is in line with Standeven and De Knop (1999) who indicated sport tourists are primarily between the ages of 15–34 years of age. In this instance, the visitors share a similar age profile.

Twenty five percent of the respondents were spending between R51–R100 per day, whilst at the festival. This figure excludes any monies paid to accommodation and refers mainly to money spent on food on drink.

As was expected, most (65%) of the South African visitors were from the Eastern Cape Province, and therefore made use of the motorcar as the primary means of transportation. The international visitors were primarily from the United States of America (19%), France (15%) and Australia (12%). In most of these countries, surfing is a popular activity.

The duration of stay of most of the visitors was between 0–2 days, and those who stayed overnight, preferred staying at backpacker lodges in Jeffrey's Bay. There are at least

four backpacker lodges in Jeffrey's Bay, as well as a flash-backer. These types lodges are popular amongs the surfers and younger visitors, as they cater primarily for this type of market.

What was quite noteworthy was the fact that the visitors were all keen on watching the surfing. It could be that a sizeable proportion of the visitors were also keen surfers and, or had come to support a particular surfer who they either admire for his surfing abilities, or

## Conclusion

The profiling of visitors to a surfing event is necessary for planning and marketing purposes, as it is useful to know who the target market is. In this instance, the event organizers can use information to further enhance the event, and the at the same time address the challenges identified by the visitors.

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# Outdoor recreation in times of change

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## Introduction

### Background

During recent years a distinctive process of change is occurring within the sphere of many outdoor recreation and adventure based activities. A *sportification* process along with a *detachment from the landscape*, two very topical and interconnected trends in society, is emerging within activities previously oriented towards more nature based leisure. A transformation of direction, focus and place is occurring. “Sportification” means that instrumental elements of competitive sport have gained ground in traditional outdoor activities that can otherwise be characterised as strongly experienced-based without explicit competitive features. The detachment of outdoor activities from the landscape concerns the increased tendency for activities in which encounters with the natural environment have been both central and desirable to be pursued in specially constructed and specialised environments. For example, we detach ourselves from climate zones and seasonal variations by pursuing “outdoor sports” in controlled indoor climates, e.g. the indoorisation of lifestyle sports (van Bottenburg & Salome 2010). Accordingly, aspects of outdoor culture are increasingly directed towards special types of exercise. A change of the activities’ content and attraction to more socially adapted and tailored activity patterns takes place.

What do different groups do, where do they do it, what kind of aids are used and what are the expressed motives? Tangible activities formed our starting point of research and the theoretical reference frames used are explained as follow.

### Theoretical frames of reference

In the analysis of *the activities’ relation to space/the landscape* Klas Sandell’s eco-strategic conceptual frame was used; a) is it a specific landscape or is it a specific activity/value that is the point of departure? and b) is human influence on the landscape recognised or not? (Sandell 2006). With regard to *what different groups choose for activities etc.* Pierre Bourdieu’s discussion of habitus was used to analyse and discuss how individuals’ embodiment of experiences are expressed in different tastes and lifestyles (Bourdieu 1984, 1990). Bourdieu’s theoretical concept has proved to be a powerful analysis tool in studies of outdoor recreation (Arnegård, 2006; Backman, 2008).

In terms of the wider societal context – what one experiences that one is able to choose from – the discussions about modernisation was used in line with social revolutionary processes in the shape of individualisation, globalisation, mediafication and commercialisation that have been emphasised as significant for our age (Giddens 1991; Featherstone 1994).

## Methods

Interviews, questionnaires, observations and text analyzes are actual data collecting methods used in the various studies that are presented in this paper. Therefore new data, secondary data and compiling earlier research has been the focal point of gaining new knowledge in connection to our research questions.

## Results

Activities such as kayaking, climbing, off-piste skiing, hang gliding, tour skating, mountain biking, multisport, adventure racing, surf ski, base jumping and kite surfing were considered. Struggles and battles as well as how one perceives the activities ought to be pursued, and the ethical and meaningful values that are relevant in a time of change and sportification were focused. Possible similarities and differences between practitioners of these different categories of outdoor recreation activities regarding the significance of personal and other factors for the choice of activity and what one understands as the meaningful content of the practice were also highlighted.

## Discussion

These trends in outdoor recreation have consequences for leadership and learning as well as on recreational activity more general, physical exercise, public health and social planning. In other words, it is about connections to globalisation, individualisation, mediafication, commercialisation, technicalisation, sportification and changed nature and landscape perspectives. Practitioners in the field need to know what these new expressions of outdoor recreation mean.

There are also possible links with other parallel social phenomena like e.g. the mobility of communication systems (smart phones, GPS etc.) with a continuously extended electronically remote landscape in archipelagos and cities alike. An example of the profound potential of these exciting borderlands is that in the relatively recent journal *Transition*, the traditionally sharp dividing line between town and country with regard to the experience landscape seems to have been dissolved, in this case on the basis of the boarding culture’s interest in handrails in the town centre and off-piste skiing in the mountains (cf. Bäckström 2005). An important “renegotiation” is taking place on large parts of outdoor recreation activities’ basic rationale – which in our view is very important and exciting to follow and try to understand.



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# Outdoor recreation and physical activity: population segmentation of participation

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## Introduction

With ever increasing levels of obesity in developed countries, the need to understand the contribution that outdoor recreation can make to the reducing the burden on the health sector has never been greater. However, although it has been generally accepted that participation in outdoor recreation can contribute to improvements in health, especially via increased levels of physical activity, there are significant gaps in the evidence. Hence, this research aimed to address the following key questions:

- What level of participation in outdoor activities is required to deliver quantifiable health benefits?
- Which social groups participate more, or less; taking into account socio-demographic, lifestyle, and geographical factors?

## Methodology

The research used data from the Wales Outdoor Recreation Survey – a large-scale household survey, with a sample size of 6000+, which is representative of the adult population in Wales, UK. Detailed information of individuals' participation behaviour was used to segment the population into statistically distinct groups, based on the differing interaction between the three key attributes of physical activity: intensity; frequency; and duration. Each 'segment' was then subject to detailed multivariate analysis using CHAID (Chi-Squared Automatic Interaction Detector). This provided a full 'profile' for each segment which considered the statistically significant differences between:

- a wide range of socio-demographic variables (including age, gender, income etc);
- 'lifestyle' factors (such as dog ownership or having children);
- geographical attributes (covering the distinction between rural and urban areas, or deprivation)

Finally, for each segment the analysis considered the main motivations and barriers to participation and the extent of latent demand expressed by each group.

## Results

The research found that the population was divided into seven statistically distinct segments. Each 'segment' has a unique combination of frequency, duration, and intensity, and while some gain the 'maximum' health benefits from their participation in outdoor recreation, others will have gained very little if any of the benefits associated with physical activity. Based on their relative levels of participation, and associated health benefits, we grouped each segment into one of three 'Zones'. These Zones are based on a 'traffic light' system:

- those in the 'Red Zone' participate the least, and gain little if any physical activity health benefits;
- those in the 'Amber Zone' take part in some degree of outdoor recreation, but in different ways fail to meet the minimum level of either frequency, intensity, or duration required for health benefits;
- those in the 'Green Zone' meet or exceed the minimum levels of physical activity required for a healthy life.

### *Segment 1: Non-participants*

People in this segment were statistically more likely to be elderly and disabled. Interestingly, gender was not a significant variable defining this group, neither was deprivation. This segment has a very low level of latent demand, stating barriers relating to 'disability', 'poor health' and 'old age'.

### *Segment 2: Rare participants*

This group was very similar to the 'non-participants' regarding the high number who were elderly with a disability, but also included a significant proportion of 'middle-aged' employed people. They are significantly more likely to live in an urban area, and to take part in less active pursuits. They express a high level latent demand to do more 'passive' activities, but face barriers relating to 'lack of time' and 'poor health'.

### *Segment 3: Infrequent, low intensity participants*

Women with children are significantly more likely to be part of this group, and are primarily motivated by 'entertaining children'. However, they only take part in more 'passive' pursuits, which limits any health benefits. Although this segment has expressed a reasonably high level of latent demand, they face significant barriers relating to a 'lack of time'.

### *Segment 4: Frequent, low intensity participants*

Participants in this segment are more likely to be dog owners, and not have any children. They live in rural areas, and their main form of outdoor recreation is dog-walking. Given that they participate at least 5 times a week, it is unsurprising that they have a very low level of latent demand.

### *Segment 5: Infrequent; moderate+ intensity; less than 150 min*

This group comprises of young to middle-aged adults, who are educated, affluent and live in urban areas. They take part in high intensity, short duration, pursuits, such as running and cycling, and are highly motivated by 'health and exercise'. They express a very high level latent demand, but are restricted by a lack of time.

Health Benefit	Activity Segment	Definition	Size
None 'Red Zone'	1. Non-participants	Have not participated in the last 12 months	6% of pop'n c. 140,000 adults
	2. Rare Participants	Have participated in the last 12 months, but not in the last 4 weeks	8% of pop'n c. 188,000 adults
Limited 'Amber Zone'	3. Infrequent; Low Intensity	Participated less than 5 times a week, and at a low level of intensity	21% of pop'n c. 494,000 adults
	4. Frequent; Low Intensity	Participated at least 5 times a week, but only at a low level of intensity	9% of pop'n c. 212,000 adults
	5. Infrequent; Moderate+ Intensity; Less than 150 min	Participated less than 5 times a week, at a moderate to high level of intensity, and for less than 150 minutes per week	26% of pop'n c. 612,000 adults
Maximum 'Green Zone'	6. Infrequent; Moderate+ Intensity; More than 150 min	Participated less than 5 times a week, at a moderate to high level of intensity, for 150 minutes or more per week	12% of pop'n c. 282,000 adults
	7. Frequent; Moderate+ Intensity	Participated at least 5 times a week, at a moderate to high level of intensity	17% of pop'n c. 400,000 adults

**Group 6: Infrequent; moderate+ intensity; more than 150 min**

Middle-aged working men with children are strongly associated with this segment. They are affluent and educated, and take part in 'active' pursuits or 'days out'. Their 'hobby' or 'the scenery' are significant motivating factors, and although they have a high level of latent demand, they are restricted by a 'lack of time' and 'places to go'.

**Group 7: Frequent; moderate+ intensity participants**

Participants in this segment are more likely to be affluent dog owners, living in rural areas. They take part in a wide range of active pursuits, and have diverse motivations. Given their high level of current participation, it is unsurprising that this group have the lowest level of latent demand.

## Conclusions

This analysis has resulted in a greater understanding of who does, and doesn't, gain health benefits from participation in outdoor recreation. Importantly, it shows that there is not a simple division between 'participants' and 'non-participants', but rather there is a complex interaction between frequency, duration, and intensity which results in 7 distinct groups. The multivariate profiling of these segments has also evidenced the interaction between different factors, indicating that it is a *combination* of socio-demographic variables which define and differentiate participation. The results of this research can now be used to inform the development of much more focused policies and interventions.

# Segmentation of salmon anglers and analysis of their motivation to fish in the Lakselva River, Finnmark, Norway

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Together with mountaineering, salmon angling is one of the oldest and most traditional form of tourism in Norway with a history back to the nineteenth century (Berntsen 1990). Today it is still important in a Norwegian tourism context, and is viewed as the most important angling product for the international market along with the saltwater angling. Several Norwegian and international studies have been investigating different types of anglers. However, this study is the first that identifies different segments of salmon anglers based on their general consumptive orientation. This is also the first study that measures the latent motives of salmon anglers in a specific context. The objective of this study is to investigate motivation for salmon angling among the anglers in the Lakselva River, and further identify segments of salmon anglers in an adequate manner. It is also an objective to investigate whether Anderson et al. (2007) consumptive orientation scale can be used as a segmentation tool among Salmon anglers in a Scandinavian context.

Data were obtained through 13 personal interviews and a web questionnaire sent anglers in the River Lakselv of Northern Norway. Totally 656 anglers responded the survey and this yielded a response rate of 68 %. By conducting an explorative factor analysis four new variables were extracted from the original twelve items adopted from Anderson et al. (2007): keep catch, catch big fish, catch many fish and catch some fish. The new variables were used to conduct a cluster analysis to identify segments in the Lakselva River. Five segments were identified: *The Releaser*, *The Consumptive Angler*, *The Harvester*, *No Catch* and *The Trophy Angler*. The identified segments differ in their motivation, socio-demographic background, angling experience and attitudes.

Cluster 1 "*The Releaser*" prefers to catch and release the big fish. The extremely positive attitude towards release fish distinguishes *The Releaser* from the other segments. However they are also one of two segments with neutral values around catching some fish and many fish. *The Releaser* and *The Trophy Angler* are the segments with the highest percentage of tourists and representatives from Finland, while they have the lowest proportion of fishermen from Norway and Northern Norway. *The Releaser* has together with *The Trophy Angler* the lowest average age. *The Releaser* and *The Consumptive Anglers* three main motives for angling in the Lakselva are to experience a challenging fight with the fish, catch big fish and enjoy nature. However *The Releaser* is the segment that is strongest motivated to experience a challenging battle with the fish and catch big fish. They are also the segment with the lowest preference for getting fish in the freezer and use different types of tackle. *The Releaser*

has the strongest place identity to Lakselv.

Cluster 2 "*The Consumptive Angler*" wants to catch big fish, but has ambivalent values in regard to the other three factors. *The Consumptive Angler* and *The Harvester* differ as the segments with the strongest preferences to store fish for later consumption. *The Consumptive Angler* and *The Releaser* are the segments with the strongest preferences to catch as many fish as possible.

Cluster 3: "*The Harvester*" has the strongest preference for retaining caught fish. *The Harvester* does however not need to catch a lot of fish to be satisfied. *The Harvester* differs as a group with a high proportion of northerners, and Norwegians, while they have few Finnish anglers. This segment has a high average age and the long fishing experience. *The Harvester* and *The Trophy Anglers'* main motives are to experience nature and experience a challenging battle with big fish. *The Harvester* and *The Consumptive Anglers* differ from the others by being the only segments showing a positive trend regarding retaining the fish for a fresh meal with family and friends. *The Harvester*, *No Catch* and *The Consumptive Angler* have a higher proportion of anglers who prefers to use other equipment than fly-fishing gear compared to *The Releaser* and *The Trophy Angler*.

Cluster 4: "*No catch*" has the lowest consumptive orientation of all the groups, and is the only segment with have no preference for big fish. This group states that the fishing trip is successful even if no fish are caught, and the catching aspect of the trip has very little impact on their experience. *No catch* has the lowest involvement among the segments. *What motivates No Catch* is the opportunity to experience nature, spend time with good friends or family and enjoy a challenging fight with the fish. *No Catch* has the lowest values in all variables associated with place identity and dependence.

Cluster 5: "*The Trophy Angler*" has the strongest preference among all segments to catch big fish. *The Trophy Anglers* does not need to catch or keep the fish to have a successful experience. *The Trophy Angler* has a low proportion of Norwegians and a few fishermen from northern Norway. They also have the lowest income and education. *The Trophy Angler* has together with *The Releaser* the strongest involvement in the activity. *The Trophy Angler* differs from the other segments by having strong motivation for the experience of nature, the wish to outwit the fish and master the angling-related challenges that the river offers. Further the *Trophy Angler* has the strongest place dependence among the segments.

To conserve the resources and operate sustainable, rivers should implement an improved management and urge to moderation among the anglers. Fishermen who are willing

Table 1. Motivations to fish the Lakselva River by angler segments. ANOVA and posthoc analyses.

Cluster	<i>The Releaser</i>	<i>The Consumptive angler</i>	<i>The Harvester</i>	<i>No catch</i>	<i>The Trophy angler</i>	Total	F-value	Thamhane posthoc
<i>Generelle motiver</i> <sup>a</sup>								
To experience nature	5,84	5,57	5,57	5,98	6,06	5,81	4,19**	5>2
To be with family/friends	5,11	5,18	5,31	5,67	5,55	5,36	2,34	ns
To enjoy solitude	4,77	4,36	4,23	4,79	4,83	4,61	3,05*	ns
<i>Fangstrelaterte motiver</i> <sup>a</sup>								
To catch a fresh fish for a meal with family/friends	2,60	4,20	4,73	3,80	3,08	3,64	24,42***	3>4>5,1;2>5,1
To catch as many fish as possible	3,34	2,99	2,15	2,08	2,26	2,61	20,33***	1,2>5,3,4
To generate a supply of fish in the freezer for non-angling times	1,11	1,77	1,57	1,24	1,25	1,40	10,85***	2>5,4,1;3>1
<i>Fiskeutfordringsmotiver</i> <sup>a</sup>								
To experience a challenging fight with the fish	6,15	5,89	5,37	5,31	5,86	5,75	9,27***	1>3,4;2,5>4
Catch a big fish	5,88	5,52	5,15	4,25	5,79	5,35	24,11***	1,5>3>4;2>4
To outwit difficult-to-catch fish using a sophisticated technique	5,34	4,99	4,67	4,43	5,41	5,00	8,55***	5,1>3,4
To master angling-related challenges	4,76	4,26	4,27	4,50	5,16	4,60	7,26***	5>4,3,2
<i>Lakselvas egenskaper</i> <sup>a</sup>								
The character of the river (width, depth, current) suits my fishing	5,56	5,27	5,23	4,97	5,71	5,36	5,21***	5,1>4
To fish on large area buying one single permit	5,04	4,98	5,36	5,09	5,31	5,14	1,13	ns
To use different kind of fishing equipment	1,67	2,42	2,94	2,27	2,08	2,24	8,22***	3>5,1;4,2>1

\*\*\* $p < .001$ , \*\* $p < .01$ , \* $p < .05$ ,  $tp < .09$ .

<sup>a</sup> Items measured on a 7-point scale where 1= Not at all important and 7= Very important.

Cluster by cluster compared using Thamhane's posthoc multiple comparison method. The > symbol denotes significance difference between clusters at a 5% level.

to provide this through a catch and release fishing based, should therefore be very appropriated and favor. Since salmon angling on good salmon beats is very easy sold, Lakselv owners' association and other providers should sell this to those who contribute most to local sustainability if tourism development is a part of future plan for the area. Based on preferences, attitudes and motives The Releaser and The

Trophy Angler are seen as the more desirable market segments in the future, as development of angling tourism will include implementing personal catch quotas and harvest restrictions.

# More than the motor: Differentiating motorized recreationists

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The growth of motorized recreation continues in the US, both on public and private lands. Between 1982 to 2001, the number of participants engaged in motorized recreation grew by more than 100% and in the last decade, the growth has been more than 30% (Cordell, 2012). Although often grouped together and compared to non-motorized visitors, motorized users likely differ. Given the participation growth in these activities and the conflict associated with their activities, a better understanding of motorized group users is necessary for improved management and planning. As such, this project explored motivations, observed conflicts, and responses to conflict among participants in four motorized recreation activities: all-terrain vehicles (ATV), off-highway motorcycles (OHM), off-road vehicles (trucks; ORV), and snowmobilers.

A mail questionnaire to systematically selected registered users, employing a modified Dillman, Smyth, and Christian (2008) technique, resulted in an overall response rate of 41.4% ( $n=1534$ ) and more than 1200 usable questionnaires. Among the groups, usable responses ranged from 283 to 382. The questionnaire was developed based on previous research and included a variety of sections, including those on motivations and on conflict experiences. Specifically, respondents identified 1) the importance of 20 motivations, based on Driver's (1977) classic recreational experience preferences, and 2) how often they experienced twelve potential sources of conflict (Carothers et al. 2001), and 3) how they responded to the conflict (Schneider & Hammitt, 1995). If respondents experienced conflict and if it interfered with the experience, the respondents were then asked additional questions regarding its source and how they responded to the conflict. Descriptive, factor, and comparative analysis assessed motivations, the conflict experiences, and responses to conflict.

Analysis revealed three motivational factors with high reliability: challenge/physical activity, nature/escape, and solitude/relax. Challenge/physical activity included opportunities to test skills and be physically active, nature/escape was assessed with items such as to experience nature and to get away from the usual demands of life, and items such as to be away from others and to rest mentally were used to measure solitude/relax. Three coping response factors with high reliability emerged from analysis: psychological distancing, displacement, and confrontive coping. Distancing included items such as trying to forget about it and not getting too serious about the situation while displacement involved leaving the area or site and planning to avoid it. Confrontive coping included talking to other group members, expressing anger to the person responsible for the conflict, and standing ground for what the respondent wanted.

One of the three motivational factors differed among groups: challenge/physical activity. Those who ride high-

way motorcycles indicated challenge and physical activity was more important than other groups. Snowmobilers also indicated challenge/physical activity was more important than ATV users. However, motivations to seek nature and relax did not differ among riders, regardless of the type of machine used.

Of the eleven sources of conflicts, ATV riders differed from the other visitors most frequently. ATV riders identified more incidents of seven types of conflict than OHM users, five more than snowmobilers, and one more than OHR riders. Snowmobilers identified fewer issues of access than either ATV users or OHR riders.

In response to conflict, ATV riders and snowmobilers employed psychological distancing more frequently than OHM and ORV riders. Snowmobilers used confrontive coping more often than ATV riders. No significant differences among the groups emerged on the use of displacement.

Mail questionnaires to registered motorized recreationists in one U.S. state revealed that motorized users differ in their motivations, conflict experiences, and responses. As such, considering them as homogenous groups is inappropriate and ineffective for optimal experience management. Specifically, OHM riders are more strongly motivated by challenges, and ATV riders have more experiences with conflict and use psychological distancing more than other groups.

Regardless of motorized vehicle for recreation, the majority of motorized trail users experience some sort conflict during a recreation trail experience. Determining if that level of conflict is acceptable is a joint decision between managers and their stakeholders. Regardless of acceptability, monitoring recreation conflict levels is imperative for effective visitor management and quality recreation experiences. One possible explanation for higher incidents of conflict among ATV riders is that they are more often part of multiple-use trail systems than the others. In the US, snowmobilers are typically the source of conflict for non-motorized groups and have less inter-group conflict on the trails whereas OHM and OHV riders may more frequently have their own trails.

The most frequently used responses to conflict among motorized recreationists are similar to previous research and suggest the continued importance of visitor education regarding appropriate trail behavior and etiquette. Ensuring that education is effective in terms of content, placement, and actual behavioral influence is essential. As media outlets and communication preferences evolve, so should educational efforts.

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# Mapping outdoor recreation benefits in Finland using national inventory data

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## Introduction

Ecosystem services are the benefits people obtain from ecosystems (Millennium ecosystem assessment 2005). They have been categorized as provisioning services, regulating services, cultural services and supporting services. Recreation benefits considered in this study belong to cultural services that are nonmaterial benefits people obtain from ecosystems. Total economic value of ecosystem refers to benefits an individual obtains from consuming services provided by an ecosystem. Recreation value discussed here are direct, non-consumptive use values produced in interaction of individual and ecosystems. In this study we analyze the spatial allocation of the recreation ecosystem services by mapping both recreation visits and their values on national scale in Finland. The value of a recreation visit is defined with an application of travel cost method.

## Methods

The study is based on second Finnish national recreation inventory data, LVVI2 (Sievänen & Neuvonen 2011). The data set contains a representative survey data of Finnish recreationists and their recreation visits (last close to home visit and over night nature trip). The data allowed us to have estimates of the annual number of recreation trips to various area types. In the analysis the area types used were as comparable as possible with the area types in GIS data sources. The area types were 1) recreation areas together with other green spaces that are used for recreation based on everyman's right e.g. private-owned forests 2) state owned recreation and nature conservation areas such as national parks 3) vacation homes and their surroundings. The recreational use to various area types was mapped on regional scale.

To obtain the values of recreation visits to each area types we used aggregate travel cost method (e.g. Vesterinen et al. 2010, Pouta & Ovaskainen 2006). Contrary to traditional travel cost models focusing on a specific site, we modeled the demand for trips to a representative site, i.e. we aggregated the destinations individuals visited most recently into the same travel cost model. We estimate the demand function for trips to each area type. The estimated demand functions provided us information to estimate the value estimate i.e. the consumer surplus of a trip to each area type. The annual recreation benefits on each region (nuts3) were calculated by estimating the average number of trips at the population level and multiplying it with estimated benefits per predicted trip. The value information was mapped on regional level.

## Results

The results of the number of visits and the aggregate values of visits and trips clearly show the importance of close-to-home recreation. The relative importance of close-to-home recreation is high compared to nature trips with overnight stay in total number of visits and values. The spatial allocation of close-to-home visits and values follow the location of population. The results of the number of use show the importance of green areas in most populated parts of the country. While the close-to-home recreation visits were further divided to area types, the importance of everyman's right is emphasized. The clear majority of the daily visits and their values distributed to areas that are used based on the everyman's right. The recreational use of nature, based on everyman's right, was emphasized also because the state areas provided for recreation and nature conservation are mostly located in northern Finland on sparsely populated areas far away from the population centers of southern Finland.

In nature trips the most resource rich areas in northern Finland, particularly Lapland was emphasized in number of trips as well as in values. The areas used based on everyman's right were the most important destinations. However, particularly in the middle and eastern part of the country and on the south-west coastal regions the high total number of the trips to summer cottages was considerable. In the northern part of the country the areas important because of their high quality recreation resources, i.e. state areas such as national parks, received about one third of the number of trips.

## Conclusions

The national recreation inventory data that included a representative sample of Finnish 15-74-year-old population allowed us to map the recreational ecosystem services in terms of recreational use of nature and to apply travel cost method pooling sites to estimate welfare effects. Although, the sample size was high on national level the regional subsamples did not allow estimations for all area types on all the regions. Still as national recreation inventory data sets exist from few European countries, our approach may provide an example how to utilize the national recreation data to evaluate the fruition of recreational ecosystem services. European wide recreation inventory with location information would provide a versatile database for analysis of recreation as an ecosystem service.



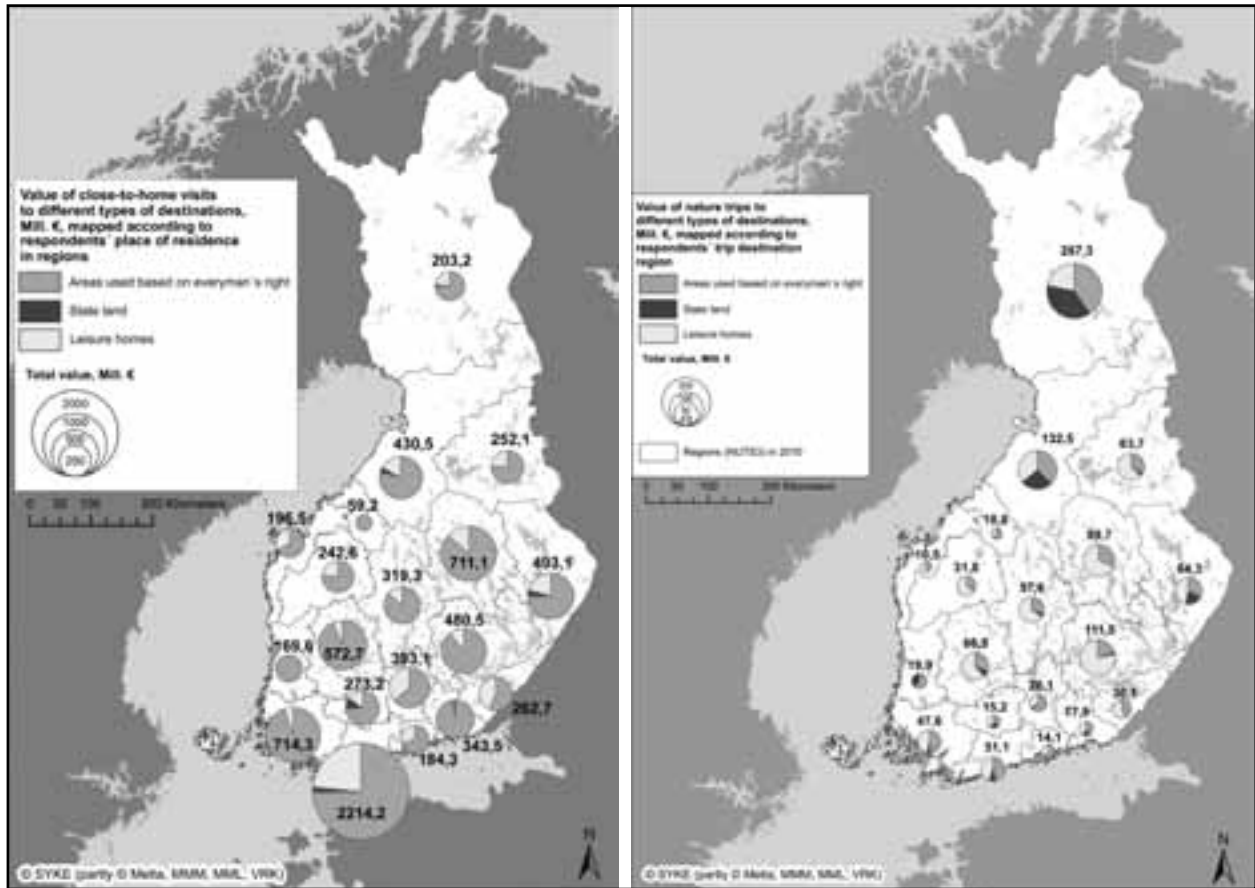


Figure 1. The value of close-to-home recreation visits and nature trips by destination types.

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# Combining indicators for recreational beach assessment: the case of the “Beach Plan Scheme” in South West France

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Natural beaches are highly attractive sites and recreational management has now become a major component of both development plans and conservation programs on the coastline. Faced with the various aspects of recreation, managers must now deal with a huge amount of information. In this respect, multivariate analysis (MA) has recently appeared as a promising tool to support the decision-making process (Monz and Twardock 2010). Yet MA approaches have often failed to integrate the economic dimensions of a problem. Up to now, the economics of outdoor recreation has tended to fall within the scope of standard microeconomic theory (Loomis and Walsh 1997). As both of these approaches provide valuable information, there may be substantial gains from combining them properly. This presentation illustrates this type of combination: first, we compare a classification of sites, based on a multivariate analysis and cost values provided by an economic approach; second, we apply the results of this combination to test the economic efficiency of various beach management strategies as defined in the “Beach Plan” program for the Aquitaine Coastline, in the South West of France. This program was devised and launched in the early 1980’s by the French government authorities and recently updated by a consortium of several public agencies. It currently includes 91 “natural” beaches (urban beaches are excluded from the plan) along a 250 km-long area. Some of the beaches are on lakesides.

## Comparing multivariate analysis and cost assessment

A set of 27 variables was selected to describe the sites. Such variables corresponded to the following themes: environment of the site, natural hazards, physical alterations and environmental management, level of use, quality of services and transport access. The variables were qualitative and were assessed with the help of experts, on a case-by-case basis. We adopted a conventional strategy, close to that of Leung and Marion (1999). This consisted of a multiple correspondence analysis (MCA), followed by a hierarchical ascendant classification (HAC). Of our 27 variables, 13 were kept for the MCA (the others were considered as illustrative variables). The results of the multiple correspondence analyses gave us some indications on data structure. The first factor (10.51% of inertia) was mainly defined by the contrast between sites with a low level of use and management deficiencies, on the one hand (negative values), and sites with a good level of services and a high level of use, on the other. Factor 2 distinguished sites in terms of their environmental management and emphasized the importance of land reservation operations. The cluster analysis was then performed to classify individuals into homogeneous groups. The best

classification identifies four clusters: (1) beaches located in a natural environment and thus providing large natural areas with a high level of use yet few facilities; (2) beaches located in the vicinity of more densely populated areas, where many facilities are substitutes for natural spaces and high levels of use are still the rule; (3) smaller sites with management problems; (4) “wild” sites where security remains a key problem despite the low level of use.

The cost analysis followed an engineering approach because data were not sufficient to allow for statistical analysis. Costs data were obtained by interviewing managers and main variables were chosen to reflect micro-economic theory. Such approaches have already been used in recreation (Loomis et Walsh 1997) and other natural spaces management studies, particularly for cost efficiency analysis (Escobedo, Wagner et al. 2007). To limit selection bias, we included as much diversity as possible and considered a four-year time period. Three main operations were considered: bathing supervision, beach clean-up, and the management of natural areas (dune forests) and of recreational facilities. Each of them exhibited specific cost properties. On this basis, 40 values for annual beach operating costs (including capital costs whenever relevant) were estimated. Applied to the four former classes, mean recreational costs were set at €47K for beaches included in class 4, €137K for beaches included in class 3, €146K for beaches in class 2 and €210K for beaches in class 1. The highest value for a single site was €385K and the total annual cost of the whole sample was estimated at 13 million Euros. Cost structures also varied among the four classes.

## Testing the cost efficiency of the “Beach Plan” program

In 2010, the updating of the “Beach Plan” scheme set new objectives which in turn led to a new classification of beaches (partly inspired by the cluster analysis). Four classes were defined: “recreation extended”, “recreation and nature”, “nature” and “lakeside”. Each of them was accompanied by an updated management standard that in turn would impact recreational costs. The simulated mean costs varied from €55K for “lakeside” beaches to €222K for “recreation extended” beaches. Each of the 91 existing beaches was distributed according to the new classes. The “incremental cost” was then defined as the cost for a beach manager to move from the current classification to the (prescribed) new one. For 18 sites, the incremental costs were negative. This implied that savings could occur by a better allocation of management effort (at least partly). The incremental costs were null in 21 cases and positive for the 52 others. Following a least costs rule, a total costs curve was defined. This

curve showed that 66 sites could be included in the new “Beach Plan” without any (overall) budget variation. In the present case, the last sites to be included were those that had initially belonged to class 4 (wild beaches). Conclusions differ significantly when other criteria are taken into account. For instance, meeting the “no social costs” criterion, which implies treating sites with human security risks or environmental damage first, would result in a total costs curves defined entirely in the first quadrant where several increasing phases alternate with several decreasing ones. Here, the implementation of the new plan induces positive outlays from the first step. In comparison, aggregation on a cost per visits principle would induce smaller changes.

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# Protected areas, the tourist bubble and regional economic development

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## Introduction

Nature-based tourism is nowadays representing an essential part of the global tourism industry. Several scholars recently indicated a tendency for mainstreaming in the sector and suggest that many natural attractions such as protected areas are increasingly drawing the attention of a wide range of different types of tourists (e.g. Weaver and Lawton, 2002). This study evaluates how the presence of a 'tourist bubble' (e.g. Jaakson, 2004) of Fordist/neo-Fordist mass tourist resorts impacts visitation and the economic leverage of tourism in nearby protected areas, drawing on case studies in the Sian Ka'an Biosphere Reserve (SKBR, Mexico) and the Souss-Massa National Park (SMNP, Morocco).

## Case study areas

The two coastal protected areas are both situated close to the most important beach resort of the respective country: Both Cancun and the 'Riviera Maya' in Mexico as well as Agadir in Morocco are the outcome of tourism strategies implemented in the 1960s with the aim of generating export-based economic growth. The tourist structure in both regions is marked by a strong emphasis on Fordist or neo-Fordist patterns of production and consumption, marketing highly standardized products to large numbers of package tourists. The regional focus on Fordist mass tourism can be expected to have substantial influences on the visitor structure in nearby protected areas, and to cause serious threats to sensible ecosystems.

## Methodology

Standardized face-to-face interviews and visitor counts were realized in each of the two protected areas at selected census points and on various days over a period of several months, so as to reflect seasonal changes in visitation. A total number of 4,736 interviews were conducted. Based on visitor counts, the total number of visitors was extrapolated using adjustment factors for different seasons and the day of the week (for methodology c.f. Mayer et al., 2010).

Different approaches for visitor segmentation were applied with reference to the distinction between types (trip motivations) and forms (patterns of travel arrangements and socio-demographic data) of tourism as suggested by Uriely et al. (2002). E.g., in order to account for the true economic value of protected areas, visitors with high and low protected area affinity were distinguished. The different visitor segments were analyzed with reference to size, structure and regional distribution of tourist expenditures, attitude toward nature protection and spatial behavior. Economic impacts from visitor spending were assessed as follows: First, gross turnover generated by tourist spending was calculated by multiplying mean tourist expenditures in different economic sectors by the number of visitor days.

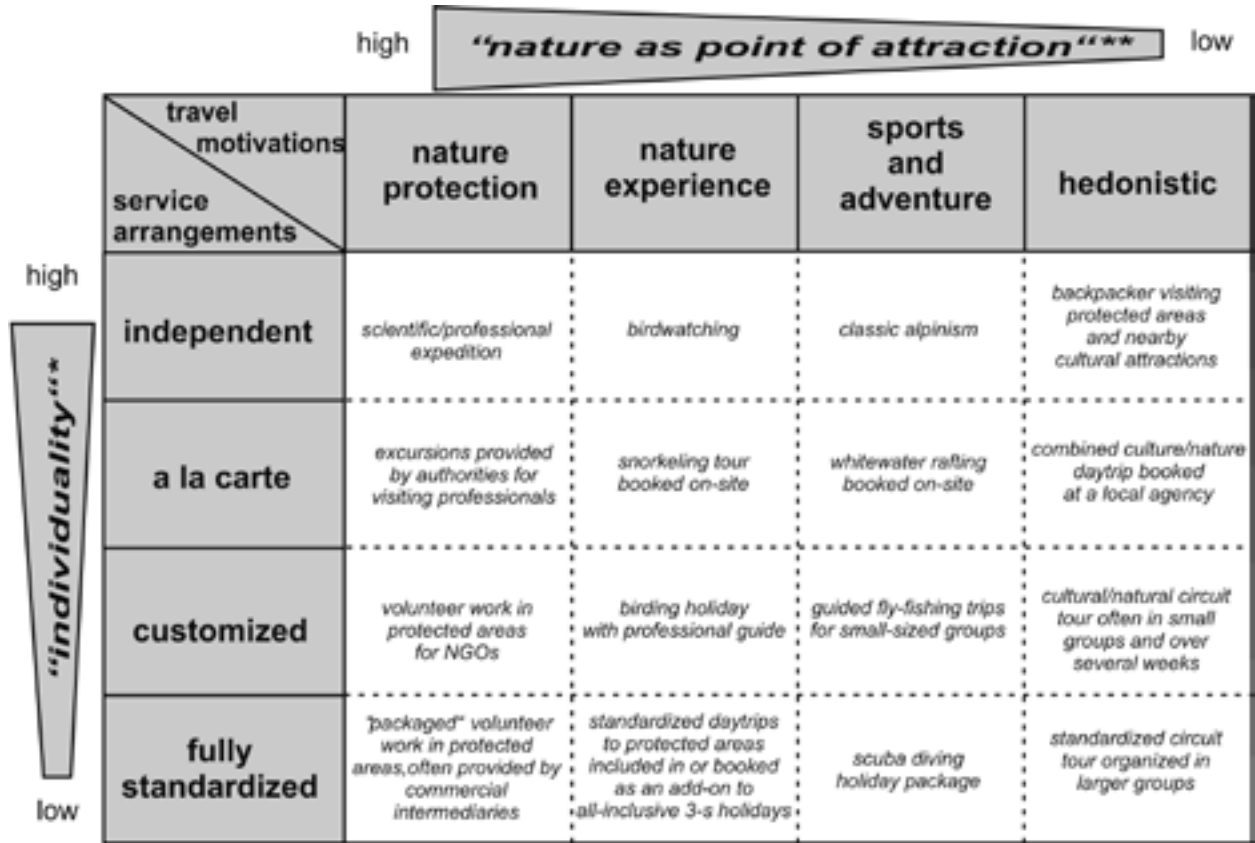
Second, regional income effects were estimated based on income multipliers obtained from regionalized input-output tables.

## Results

Both protected areas can be considered of considerable importance for the regional economy: The total regional income effects of tourism in the SKBR and the SMNP account for USD 1,023,300 and USD 1,867,400 respectively. Accessibility from regional mass tourist resorts has a strong influence on the heterogeneity of the visitor structure. With reference to a classification of tourist demand proposed by Pearce (2008), both SKBR and SMNP are visited by independent, customized and package tourists. Significant differences were found between those groups with regards to spending behavior; e.g., customized tourists, a segment that includes special interest visitors like fly-fishermen or bird-watchers, spend between 52.7 and 79.6 percent more than the average visitor and represent thus a small yet attractive market segment. With regards to visitors' motivations, it was found that in the SKBR as well as in the SMNP tourists with high nature affinity spend, on average, more money than travelers with more indifferent trip motives.

## Conclusions

In both protected areas the visitor structure and its economic and ecological implications are currently not assessed with a socioeconomic monitoring; management decisions regarding tourism development are thus often based on weak or incomplete information. In a deductive approach based on experiences from the two case studies, a conceptual framework is suggested to help protected area managers and regional tourism planners identify core market segments, professionalize visitor management strategies and promote tourism products that are both economically attractive and environmentally sustainable (Arnegger et al., 2010). Incorporating both the supply and demand sides of tourism, a two-dimensional matrix links four different travel motivations to four different degrees of standardization in service arrangements, thus giving a total number of 16 nature-based tourism product types (c.f. figure 1).



\*extent to which service arrangements are booked individually decreases

\*\*relevance of nature for the product decreases

Figure 1. Classification for nature-based tourism based on nature orientation of tourism product types and service arrangement categories (with typical examples). Source: Arnegger et al. (Arnegger et al., 2010).

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# Uncertainty in the contribution of outdoor recreation to local and national economies

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There has long been interest in understanding outdoor recreation's contribution to local and national economies, and this has intensified as traditional resource industries have declined in many rural areas (Lundmark, 2005). Economic impact analyses often rely on visitor reports of expenditure, either during-trip or post-trip. However, such reports may involve uncertainty about past or expected expenditure, and this uncertainty may increase when it involves expenditure made for, or by, others.

Previous studies have evaluated the accuracy of reported expenditure, defined here as the level of consistency between actual and reported expenditure (see Stynes and White (2006) for a review). For example, Champ and Bishop (1996) found that hunters were able to accurately recall expenditure via post hoc surveys, using expenditure diaries as the reference for actual expenditure. Rylander, Propst, and McMurtry (1995) evaluated respondent self-reported accuracy in two contexts. First, accuracy was modeled as a function of response wave. Second, accuracy was modeled as a function of boater segments and associated trip complexity. They found that respondent confidence in expenditure reports decreased with trip complexity.

Evaluations of respondent uncertainty have been conducted in the non-market valuation field, especially with respect to contingent valuation (CV). In CV and related non-market valuation techniques, respondents directly or indirectly report the monetary value they place on an object. CV research has shown that stated preferences involve uncertainty with respect to intended behavior and absence of transaction experience, while research on expenditures has shown that uncertainty is a matter of recall and/or memory bias of actual behavior (e.g., Rylander et al., 1995). The two main approaches to studying respondent uncertainty in CV are the polychotomous approach, when respondents express their uncertainty during the choice task through multiple choice WTP alternatives (e.g. Akter et al., 2009), and the numerical scale approach, when the WTP question is followed by a numerical (un)certainly scale (e.g. Li and Mattsson, 1995). To our knowledge, no previously-published expenditure studies 1) provided the opportunity to correct reported amounts or 2) utilized corrections or certainty evaluations to adjust estimated expenditure.

In Sweden, as in many other modern societies, outdoor recreation occurs within more globalized, specialized, and commercialized lifestyles, and Swedes are increasingly purchasing their nature experiences. Data for this study are from an internet panel representative of the Swedish adult population (aged 16 or above) collected on three occasions during 2009. Each occasion referenced a different time period: Jan–Apr, May–Aug, Sep–Dec ( $n = 3 \times 2000$  responses). Respondents were asked to report their participation in 43 different outdoor recreation activities grouped into 25

categories (based on a previous national survey on outdoor recreation participation; see Fredman et al., 2012). They then reported expenditures associated with participation by themselves and others (e.g. family members and friends). Expenditure was grouped into nine categories: transport, fuel, lodging, groceries, restaurants, equipment, clothing, entrance and related fees, and “other expenditures”.

Respondents were then prompted to correct their reports (as needed) by category and asked about their certainty regarding the accuracy of their overall report (original or corrected). Certainty was reported on a scale from 0% (not at all certain) to 100% (completely certain), converted to a 0 to 10 scale for analysis. Respondents also completed a payment card CV question measuring the total value of outdoor recreation beyond actual expenditures. This question was also followed by certainty in the reported figure (same design as for expenditure).

Three issues were evaluated. First, certainty reports for CV and expenditure were compared. As shown in Figure 1, there was commonality in the distribution of certainty reports. The Pearson correlation coefficient between the two is 0.357 and statistically significant ( $p=0.000$ ). This indicates that respondent characteristics affect certainty reports across different tasks.

Figure 1 also illustrates differences, with the expenditure distribution being flatter and with fatter tails, especially at the lowest level of certainty. The mean certainty for expenditure was 5.74 and for CV was 6.56. The difference is statistically significant based on a paired t-test ( $p=0.000$ ). This indicates that task characteristics also affect certainty reports. CV uncertainty is assumed to derive from the lack of a familiar market for the good being purchased, while expenditure uncertainty derives from memory limitations.

Second, three measures of total expenditure were calculated and compared:

- Naïve – original reports used, no accounting for uncertainty.
- Change – corrected reports used (when made), no accounting for uncertainty.
- Uncertainty – corrected reports used (when made), weighing for uncertainty.

Mean and median values were similar across all three measures, with a variation of five percent or less. In this case, adjustment did not substantially affect conclusions about overall expenditure.

Third, the pattern of corrections was evaluated. Seven percent of respondents corrected their reported expenditures in at least one category. The category with the fewest changes was Other expenditure; of those making changes, 10% changed their report of Other expenditure. Groceries was the most frequently changed, at 27%. The frequency of

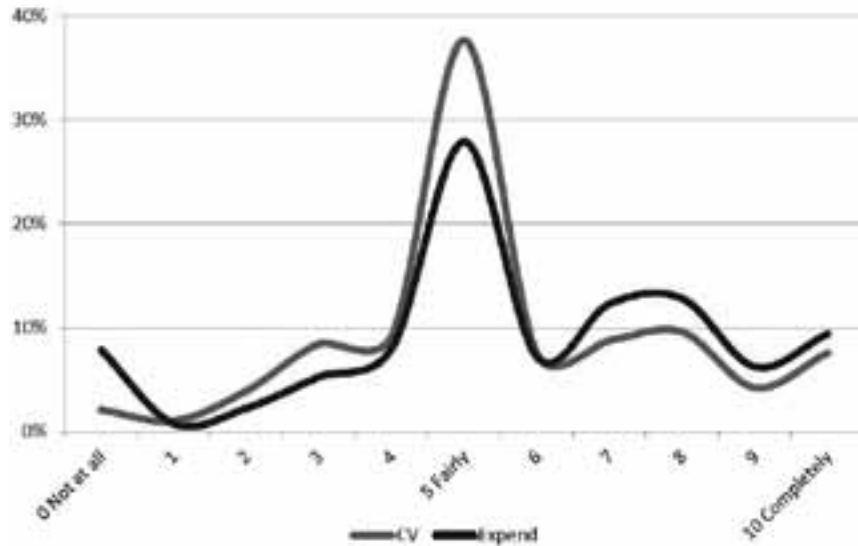


Figure 1. Respondent certainty distributions, percent within each of CV and expenditure contexts

changes to the Groceries category may reflect uncertainty about whether any given food purchase was associated with outdoor recreation rather than general consumption.

Certainty also was evaluated, using OLS regression, as a function of expenditure and demographic characteristics (model  $R^2$  was 0.166). Certainty was positively associated with percent of total expenditure allocated to the Other expenditure category, and with higher income, being male, and age. It was negatively associated with the number of categories in which expenditure was made (i.e., complexity) and the percentage of total expenditure allocated to groceries or restaurants.

The above results reflect preliminary analysis. Further analysis of these data is warranted, including at the category-specific level (rather than the above regression of overall certainty). Replication in other contexts, notably intercept

or trip-specific post hoc surveys, would provide insight on the prevalence of current findings. Lastly, there is value in exploring relevant concepts from fields such as the psychology of certainty and survey recall.

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# Effects of water quality changes on recreation benefits in Finland: Combined travel cost and contingent behavior model

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## Valuing the changes in water quality

To improve the information base for the implementation of the EU Water Framework Directive, this study examined the effects of changes in water quality on the recreation benefits obtained from swimming trips in Finland. Traditionally, the benefits of water-related and other outdoor recreation have been estimated with the travel cost (TC) method, in which the variation in travel costs among individuals is used to derive a demand curve for recreation, and the benefits of the recreation are then calculated as a consumer surplus. Travel cost method can be used to value water quality changes by pooling data from sites with different water quality and estimating the effect of variation in water quality on number of trips taken. Water quality may not, however, vary enough between the sites to get policy relevant results, and forecasting recreation behavior beyond the range of observed variation can be problematic (Whitehead et al. 2000). To avoid the weaknesses of travel cost method when estimating welfare effects of environmental quality changes, researchers have increasingly applied combined travel cost and contingent behavior (CB) approach. The contingent behavior method elicits information on how many recreation visits respondents would make under hypothetical environmental quality and thus makes it possible to study changes in environmental quality that are beyond the observed levels. Combining the TC and CB data enables estimation of demand curve for swimming as a function of travel costs and water quality and thus the effect of water quality changes on recreation benefits can be calculated (Englin & Cameron 1996; Eiserwerth et al. 2000).

In this study respondents were asked how many times they would go swimming in the case that a) water quality improved to a level that bottom of the water could be seen from the surface at a depth of over two meters and if no slime was present and b) water quality decreased so that the bottom could be seen from a depth of less than one meter and there was abundant slime on the rocks and piers.

## Methods

The data analyzed in this study comprised one section of the Finnish National Outdoor Demand Inventory 2009–2011 that was carried out in 2009 and 2010 three times per year. Each round included a general part that elicited information on general outdoor recreation behavior and a variable section collecting data on a particular special theme, such as that of water quality changes and swimming behavior investigated here. The data were collected from a sample of 15- to 74-year-olds from the Finnish general population. In total, 1617 respondents participated in the survey round analyzed here, representing a response rate of 40.4%.

The combined data set is in panel format, each respondent represented by three observations: one observation based on actual swimming trips made in the past 12 months and two observations on intended future trips under hypothetical water quality conditions. Since the data is in panel format and the dependent variable can take only nonnegative integer values we estimate the models with negative binomial random effects model.

## Results

On the basis of the estimated econometric models (Table 1) swimming trip frequency is affected by water quality as expected. The statistically significant travel cost and TC-water quality variables allow us to calculate the per trip value of swimming and the effects of water quality changes on the value. Other variables found to influence swimming trip demand statistically significantly are household size, having access to a shorefront second home, owning a boat and typical origin of a swimming trip being home or a second home.

We estimate the recreation value of swimming to be about 18 Euros per trip under current conditions. If water quality improved to a level at which respondents perceived visibility of over two meters and no slime, the consumer surplus would be about 46 Euros. In the case perceived visibility decreased to less than one meter and there would be abundantly slime on the rocks and piers or it could be felt on skin when swimming or after swimming the consumer surplus per trip would decrease to seven Euros.

To calculate the aggregate welfare effects of water quality changes, in addition to changes in per trip values, we need to know how visit frequency changes due to water quality changes. The mean predicted number of trips from the RP-SP model is 25 (in the model sample), improved water quality increases it to 33 and decreased water quality, in turn, reduces it to 9 when holding other variables constant. In the data under the current water quality the average number of annual swimming visits was 19, under improved quality 25 and under decreased quality 11. On the basis of the predicted number of trips and the data averages the aggregate recreation benefits of swimming are 1.22–1.66 billion Euros annually under the current water quality. A decrease in water quality so that water clarity was less than one meter and slime was abundant would cause benefits to fall to 0.20–0.24 billion Euros or 80–90%. Increase in benefits due to quality improvement would also be remarkable, benefits rising by more than threefold.



Table 1. Estimated TC-CB model

<b>Independent variables</b>	<b>Coefficient (t-ratio)</b>
Constant	0.725 (1.83 <sup>b</sup> )
Travel cost	-0.056 (-2.32 <sup>b</sup> )
Household gross income	-1.1*10 <sup>-5</sup> (-0.50)
Not employed	0.225 (2.30 <sup>b</sup> )
Household size (persons)	-0.128 (-3.65 <sup>b</sup> )
Lives in detached house or in a farmhouse	0.292 (2.95 <sup>b</sup> )
A beachfront summer house available	0.313 (2.88 <sup>b</sup> )
A boat available	0.261 (2.74 <sup>a</sup> )
Typically goes swimming from home	0.499 (2.29 <sup>b</sup> )
Typically goes swimming from a second home	0.466 (2.02 <sup>b</sup> )
Poor water quality	-0.975 (-13.42 <sup>b</sup> )
Good water quality	0.279 (5.28 <sup>b</sup> )
Travel cost - poor water quality interaction	-0.084 (-2.40 <sup>b</sup> )
Travel cost - good water quality interaction	0.035 (1.66 <sup>c</sup> )
Alpha	
Number of observations	1135
Number of respondents	470
Log-likelihood	-3848.56
Restricted Log-likelihood (constant only)	-4196.25
Log-likelihood ratio	695.38

<sup>a</sup>, <sup>b</sup> and <sup>c</sup> indicate significance at the 1%, 5% and 10% levels, respectively

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# Recreation travelers' carbon footprint

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Outdoor recreation on public lands provides many benefits. Spending by visitors in communities near the recreation site provides regional economic benefits by supporting and sustaining jobs. There are also many non-market benefits. Personal benefits include improved health, greater connection to nature, reduced stress, and better quality of life. Social benefits can include strengthening family ties and improved stewardship ethics. Valuation of these non-market benefits has typically come through the Travel Cost Method (TCM), a technique which uses out-of-pocket and time costs for travel to the recreation site to estimate the value of access to the site.

One aspect of recreation travel that has thus far been ignored is its carbon footprint. Carbon emissions from recreation travel are externalities, created by households in the production of recreation trips. We posit that the value of the carbon should be offset against the values generated under a traditional TCM approach. In this paper, we use data from the Forest Service's National Visitor Use Monitoring program to examine the size and value of the carbon created by visitation to the US National Forest System. We evaluate the carbon footprint of several different types of visits, and calculate an overall estimate of the carbon generated by the roughly 170 million annual visits to National Forests and Grasslands.

## Data and computations

Data for this analysis came from the Forest Service's National Visitor Use Monitoring (NVUM) program. We used the individual recreation responses for the most recent NVUM application on each National Forest, which spanned the period 2007–2011.

For some portion of NF visits, recreating on the forest is not the main reason for taking the trip from home. Rather, it is a side trip. To value a visit to such a secondary destination, a standard approach is to assume a minimal value for the marginal spending or non-market value created by the side trip. We divided the sample into three groups: local residents (travel distance  $\leq 50$  miles) whose primary destination was the National Forest visited, non-local residents whose primary destination was the National Forest visited, and those whose primary destination was somewhere else. For the last group, we assumed their marginal travel was the same as local residents whose primary destination was the forest. We estimated the number of total visits for each group. Dividing by the mean number of people per vehicle yielded vehicle visits.

Respondents provided travel distances from home to the recreation site. We assumed that for most visits, the key transportation mode was by car. US EPA provides an average mile per gallon (20.4) and metric tons of CO<sub>2</sub> per gallon (0.00892) conversion (<http://www.epa.gov/clean-energy/energy-resources/refs.html>). A small portion of the

Non-local primary visitors reported round-trip distances in excess of 5,000 miles. We assumed that these trips were mostly by airplane and not by car. US EPA provides conversion from passenger-miles to CO<sub>2</sub> (0.000193 metric tons per passenger mile for long haul trips (<http://www.epa.gov/climateleadership/smallbiz/footprint.html>)).

## Carbon emissions and social costs

Carbon computations were straightforward (Table 1). Carbon from cars equaled (vehicle visits)\*(mean car miles per vehicle visit)\*(1 gallon/20.4 car miles)\*(0.00892 metric tons CO<sub>2</sub> / gallon). Carbon from air travel equaled (visits) \* (mean air miles per visit) \* (0.000193 metric tons CO<sub>2</sub> per mile). Total carbon generated by recreation travel to US National Forests is estimated at 9.23 million metric tons. Non-local residents coming primarily to the forests account for about 37 percent of visits, but about 90% of the carbon footprint. Nearly two-thirds of the estimated carbon footprint comes from car travel. Only 2.5% of nonlocal primary flew, but that travel accounts for nearly one-third of total carbon.

Our next step was to calculate the social cost of carbon emissions. US EPA provides guidance (<http://www.epa.gov/oms/climate/regulations/scc-tds.pdf>) for monetizing the social cost of carbon. For this analysis we used the middle value for the three models presented, at \$21.40 per metric ton in 2010. At this price, carbon created from recreation travel is valued at \$197.52 million, or about \$1.19 per visit to NFS lands. By comparison, consumer surplus estimates for recreation visits to National Forests are about \$61 per visit (in \$2010). That is, accounting for the social cost of carbon reduces the net economic value of recreation by a little less than 2 percent. Although the carbon costs are nontrivial, it appears that not including them does not lead to gross overestimates of the value of recreation on National Forest lands.

Several additional analyses could refine our results. We assumed a national average for miles per gallon. Driving to and into National Forests may yield fuel efficiencies different from national averages. Regional differences in road conditions, travel speeds, transporting recreational equipment, and vehicles used could have important impacts. We assumed no relationship between distance traveled and persons per vehicle. It could be that people amortize the costs of longer travel by increasing party size. Our assumption for air travel for non locals visits traveling more than 2500 miles one way was fairly naïve, but we lacked more accurate data for air travel. Our analyses only concern travel to the Forest, not activity-related travel once there.

Table 1. Carbon footprint calculations for visits to the National Forest System, 2011

	VISIT TYPE (residence and if NF is primary destination)			National Total
	Local residents, NF is primary destination	Non-local residents, NF is primary destination	NF is Secondary Destination	
NF Visits (millions)	82.55	61.98	21.16	165.69
Mean people per vehicle	2.21	3.10	2.93	
Vehicle Visits (millions)	37.34	19.99	7.22	64.55
Mean roundtrip car miles per visit	37.55	587.70	37.55	
Total Car miles (millions)	1,401.9	11,749.8	272.8	13,424.5
<b>CO2 from car travel (millions of metric tons)</b>	<b>0.62</b>	<b>5.14</b>	<b>0.12</b>	<b>5.88</b>
Mean roundtrip air miles per visit	0	280.3	0	
Total Air miles (millions)	0	17,373.0	0	17,373
<b>CO2 from air travel (millions of metric tons)</b>	<b>0</b>	<b>3.35</b>	<b>0</b>	<b>3.35</b>
<b>TOTAL CO2 (millions of metric tons)</b>	<b>0.62</b>	<b>8.49</b>	<b>0.12</b>	<b>9.23</b>



ORGANIZED SESSION: ORAL

## Interpretation as strategic communication in protected area management

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A strategic view of interpretation's role in protected area management will be presented. Communication is "strategic" when choice of messages and delivery systems are based on an empirical understanding of the influence communication can have on protected area visitors. Drawing on communication theory supported by research conducted in the USA and Australia, this session highlights three roles for strategic interpretation in protected area management – enhancing visitor experiences, purposefully influencing attitudes, and shaping on-site behavior in fragile settings.

# Interpretation as strategic communication in protected area management

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**Eva K. Sandberg**, Swedish Centre for Nature Interpretation, Sweden

A strategic view of interpretation's role in protected area management is presented. Communication is "strategic" when choice and delivery of messages are based on an empirical understanding of the influence communication can have on protected area visitors. Drawing on communication theory supported by research conducted in the USA and Australia, we highlight three roles for strategic interpretation in protected area management: enhancing visitor experiences, purposefully influencing attitudes, and shaping on-site behavior in fragile settings.

## Enhancing experiences

Numerous social scientists in the parks and tourism fields have argued that good interpretation makes a positive impact on visitor experiences. Examples include Arnould & Price (1993), Beck & Cable (2011); Brochu & Merriman (2008), Cameron & Gatewood (2000), Cohen (1985), Geva & Goldman (1991), Ham (2007, 2009), Ham, Housego & Weiler (2005), Powell & Ham (2008), Ward & Wilkinson (2006), and Weiler & Ham (2001).

Two lines of reasoning support the claim of these writers. In experiential psychology, "experience" is seen as residing in the thoughts that human beings think. Obviously, when interpretation succeeds in provoking a person to have personal thoughts and to make personal meanings about a place or thing, it helps to shape that person's experience with the place or thing. The meanings made are themselves central to the experience. And if these thoughts are pleasing or gratifying in some way, "experience," by definition, has been enhanced.

Another line of reasoning comes from studies that specifically examined interpretation's role in tourists' experiences. Findings reported by Pearce & Moscardo (1998) showed that the interpretive aspects of an Australian rainforest visit contributed positively to visitors' overall satisfaction with their experience. Hwang, Lee, and Chen (2005) found that visitors' satisfaction with interpretive services contributed in positive ways to their sense of place attachment in Taiwanese national parks. Powell & Ham (2008) reported that the most highly rated experiences by Galapagos National Park visitors resulted largely from guests' enjoyment of the interpretive aspects of their trip. Of eight different aspects of visitors' experiences compared, "quality of interpretation" and "quality of my guides" were two of the top three associated with high satisfaction ratings. And finally, a study of international tourists in Panama (Ham & Weiler, 2007) found that not only did the interpretive dimensions of tourists' experiences add to visitors' satisfaction, they were the *main* contributors among eleven different criteria examined.

## Promoting appreciative attitudes

Dozens of studies from social and cognitive psychology (see reviews in Fishbein & Ajzen, 2010 and Petty & Cacioppo, 1986) support the claim that interpretation can succeed in promoting positive attitudes about a place if it is specifically designed to do so. Three decades of research on the theory of reasoned action (TRA), theory of planned behavior (TPB) and the elaboration likelihood model of persuasion (ELM) have produced an impressive record of consistent findings showing that when communication provokes thinking about attitude-relevant beliefs, an impact on corresponding attitudes is likely to result. ELM studies, in particular, demonstrate that the more thinking an interpretive encounter provokes, the stronger and more enduring the resulting attitudes can be. According to these studies, communication that succeeds in provoking audiences to think stands a greater likelihood of impacting attitudes than communication that fails to provoke thinking. Interpretation that is perceived by its audience to be both relevant and easy to process stands the greatest chance of provoking effortful thought (which is called the "central route" to persuasion in ELM vernacular). However, shorter-lived attitudinal impacts are possible even when thinking is less effortful (the so-called "peripheral route" to persuasion).

## Influencing visitor behavior

Interpreters today are often interested in using interpretation as a management tool aimed at deterring or eliminating certain visitor behaviors. Recent research has dealt with a wide range of problems including proper food storage by campers, reducing wildlife feeding, persuading visitors to pick up litter, keeping dogs on leashes, and convincing tourists to donate to local conservation funds. See Brown, Ham & Hughes (2010), Ham (2004), Ham & Ham (2010), Ham, et al. (2008), Hughes, Ham, & Brown (2009), Lackey & Ham (2003, 2004), Powell & Ham (2008), Widner & Roggenbuck (2003), and Winter (2006).

The two most successful approaches to influencing behavior have been the "normative" approach and the "reasoned action" approach. The normative approach is often seen as a "peripheral route" to influencing behavior wherein interpretation appeals to an audience's desire to be socially correct and to avoid social ridicule. In other words, normative approaches apply social pressure to encourage appropriate or desirable behavior. As such, normative messages usually stress what most other people "normally" do, and/or what important others approve or disapprove of (that is, whether they think the behavior is good or bad). Normative messages have been especially effective in reducing littering and deterring off-trail hiking, as well as in influencing other environmentally relevant behaviors such as curbside recycling.

See Cialdini (1996) and Cialdini, Kallgren & Reno (1991) for discussions of the theoretical bases of normative appeals.

The reasoned action approach comes from studies showing that our behavior is consistent with a small set of truly pertinent beliefs we have about the behavior. According to this approach, to convince visitors to behave in a given way, an interpretive encounter must influence their beliefs about that specific behavior. If their beliefs about the consequences of engaging in the behavior are predominantly positive, it will lead them to have a positive attitude about the behavior, which in turn increases the likelihood they will behave as managers want. Unlike the normative approach, the reasoned action approach assumes a “central route” persuasive impact. See Fishbein & Ajzen (2010) and Ajzen & Fishbein (2005) for reviews of research on the reasoned-action approach.

Studies (see Fishbein & Ajzen, 2010) have indeed shown that when communication succeeds in impacting an attitude

de about a behavior in a positive way, the desired behavior is more likely to occur. Studies, however, do not support the idea that general attitudes about something will lead to specific behaviors with respect to it. According to reasoned action research, for interpretation to purposefully influence a given behavior it must first succeed in influencing people's beliefs about that specific behavior.

In 2010, the two approaches (normative and reasoned-action) were combined into a single model of human behavior and research continues to explore new and better ways interpretation can influence behavior, both within this new integrated model (Fishbein & Ajzen, 2010) and according to other theories. Virtually no study has shown 100% success in influencing behavior, but significant increases in preferred behaviors have been documented in so many studies that there seems little reason to question whether interpretation can make a strategic difference in how audiences behave.

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# Environmental messages, diver attitudes and depreciative behaviours: Does how we communicate environmental messages to recreational divers and dive tourists really matter?

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## Introduction

Scuba diving is a popular tourism activity which can contribute to marine ecosystem degradation (Barker & Roberts, 2004). Most research on diver impact mitigation has examined pre-dive briefings and Dive Master interference (ibid); limited research explores diver certification courses (Lindgren, et al., 2008). Extensive research has examined the efficacy of environmental messages in eliciting pro-environmental behaviour (Bradford, 2005) among other types of recreationists and tourists.

This study used the Elaboration Likelihood Model of Persuasion (ELM) (Petty & Cacioppo, 1986) as a framework to determine the effectiveness of environmental communications with SCUBA divers certified by the British Sub Aqua Club (BSAC), the Professional Association of Diving Professionals (PADI) and Scuba Schools International (SSI).

The ELM (Petty & Cacioppo, 1986) has been used extensively to model effective environmental communication in recreation, tourism and natural resource management. According to Marion and Reid (2007) “the central route to persuasion is most appropriate when educational goals include instilling an enhanced environmental ethic, or when ... targeting unintentional deviant or depreciative behaviours” (pp. 11). The central route to persuasion relies on attention, consideration and internalization of messages and arises from the Theory of Planned Behaviour (Kohl, 2005). It allows message recipients to process information, synthesize it with past experiences and knowledge, and to evaluate it (Marion & Reid, 2007). Message recipients’ attitudes change and are integrated into their belief structure, resulting in long term behavioural change. Message recipients are likely to behave in accordance with their changed attitudes “if they retain the message and attitudes” (Marion & Reid, 2007, pp. 11).

## Methodology

A sequential-exploratory strategy was undertaken. The first phase used content analysis of novice BSAC, PADI, and SSI certification manuals, coded for low impact diving content, message format and associated diver processing pathway (central or peripheral).

Based on the content analysis, an e-survey was created and administered to determine divers’ knowledge retention and demographics. The sample was a convenience, purposive, snowball sample of certified divers, who completed their novice dive training with BSAC, PADI or SSI. Respondents

were 18 or older, and recruited through online diving forums, dive club, dive store or dive resort e-mail lists.

Tests were graded to determine divers’ knowledge retention levels. One-way ANOVAs were used to determine whether statistically significant ( $p < 0.05$ ) differences existed in respondents’ retention levels at a 95% confidence level. Pairwise comparisons were determined to be significant using a Bonferroni post-hoc analysis. Subsequently, Crosstabs and Chi Square analyses were used to determine the percentage of respondents from each certifying body who answered individual questions correctly / significantly, determining which low impact concepts were not retained. Triangulation illustrated the impact that communication assumed to result in processing along the central and peripheral routes to persuasion had on knowledge retention and its potential behavioural implications. These findings were then compared to the theoretical processing pathways articulated in the ELM.

## Results & discussion

The relative efficacies of the manuals were compared based on their use of the message formats assumed to result in processing along the central and peripheral routes. The manuals’ use can be ranked: BSAC (85.45%); SSI (83.59%); and, PADI (74.94 %). Therefore, the manuals were hypothesized as most to least effective from PADI, to SSI and then BSAC prior to analyzing the e-survey results.

In total 499 usable responses to the e-survey were received, comprised of: 128 BSAC divers; 301 PADI divers; and; 70 SSI divers. Respondent divers were evenly dispersed across certification levels. Of all the respondent divers, 90.4% passed the knowledge test with a score of 80% or higher, while 9.6% failed with a score of 79.9% or lower (divers must score 80% or higher to be certified). There was no statistically significant ( $p > 0.05$ ) difference between the number of BSAC, PADI and SSI divers’ who passed the test ( $\chi^2 = 0.139$ ,  $df = 2$ ,  $p = 0.933$ ). There were no statistically significant variations in mean test scores ( $F = 0.242$ ,  $df = 2$ ,  $p = 0.785$ ) based on novice certification. This is unsurprising given that divers must possess a significant level of initial knowledge, and the majority of respondents had logged their last dive within 6 months (84.86%) and taken advanced training (99.1%), factors found to increase knowledge retention (Semb & Ellis, 1994).

However, differences in the number of BSAC, PADI and SSI divers’ who answered individual questions incorrectly were significant ( $p < 0.05$ ). These differences highlight



where environmental communications can be improved. This study found that the manuals using message formats assumed to result in processing along the central route were more effective in producing retention of individual concepts. The manuals that made use of a combination of message formats resulting in combined processing along the central and peripheral routes were also effective, suggesting that the additive effect of multiple messaging formats also encouraged knowledge retention.

Despite the consistent effective pattern of the observed messaging formats believed to result in processing along the central and peripheral routes to persuasion, which accords well with the theoretical ‘persuasive communication-information processing-attitude-predicative behaviour’ pathway of the ELM, it failed to completely explain the observed phenomena. As such, a Predictive Behavioural Outcomes Model of Effective Communication is proposed (Figure 1).

This model illustrates a theoretical ‘persuasive communication-information processing-attitude-skills competency-behaviour’ pathway while taking into consideration the impact of constraints on divers’ adoption of desired behaviours.

### Conclusion

This research met the objectives of determining the nature of environmental communications with scuba divers, examining their levels of post-certification knowledge retention, the theoretical impact of knowledge retention and message processing on divers’ attitudes towards low impact diving and in-water behaviour thereby ascertaining whether or not the environmental messages contained in the certification manuals of BSAC, PADI and SSI novice courses were effective. The research concluded that the manuals were moderately effective in achieving this goal, but that revisions to each manual would increase their effectiveness. This study was therefore able to shed light on the effectiveness of environmental communication with scuba divers.

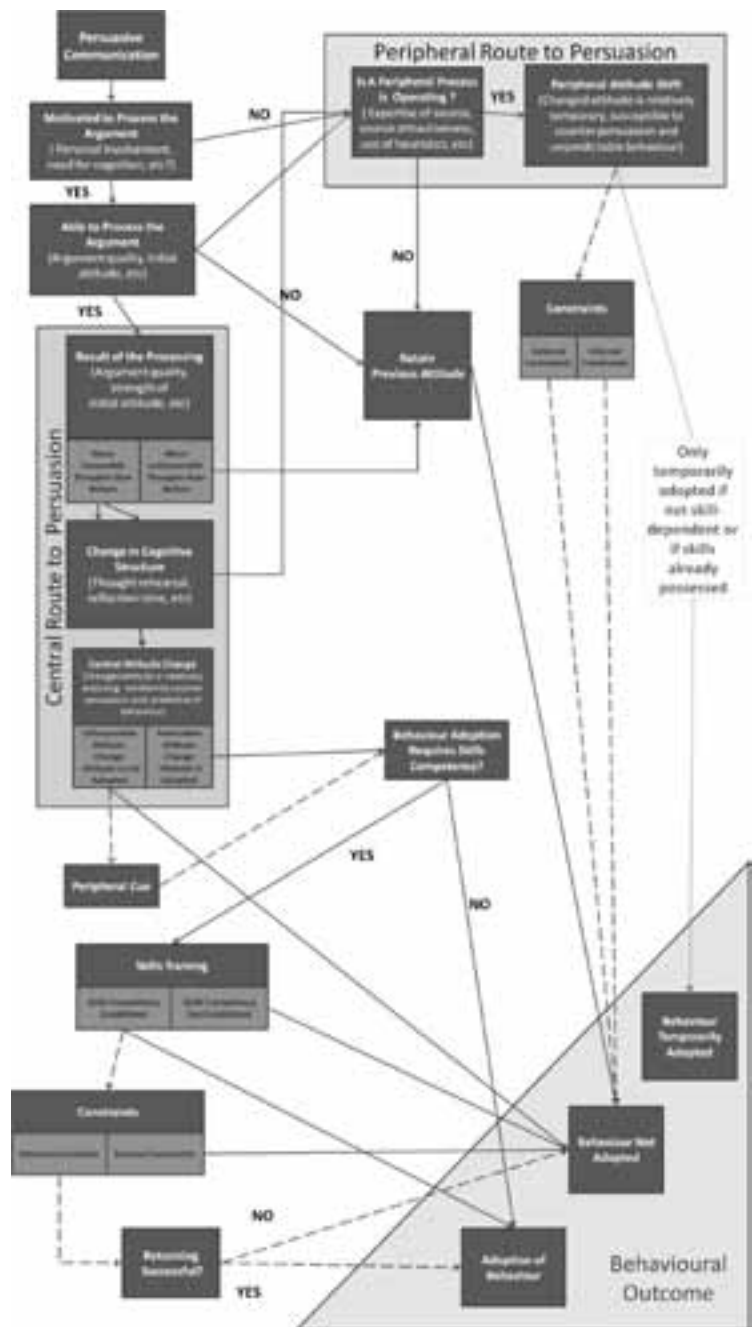


Figure 1. Predictive Behavioural Outcomes Model of Effective Communication

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# Building a proactive conservation strategy for Mt Fuji's foreign climbers

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## Conservation of Mt Fuji's natural and cultural heritage

Mt Fuji is Japan's tallest mountain at 3776m and in 2007 it was added to the UNESCO World Cultural Heritage Tentative List, partly due its long history of pilgrimage. Mt Fuji is already designated within Fuji-Hakone-Izu National Park, among the most visited in the world. Yet despite its multiple – and at times overlapping – designations, conservation of natural and cultural heritage is no simple matter. Like the pilgrims of yesteryear, today's climbers take advantage of a short summer window (the official season runs from July 1<sup>st</sup> to August 26<sup>th</sup>) when the majority ascend under cover of darkness in time to see the sun rise from the summit. In 2008, the total number of climbers was estimated to have exceeded 400,000 (an average of over 7000 climbers per day) during peak season, with even higher densities on the weekend (Yamamoto et al, 2009). This unique set of circumstances makes it very difficult for Mt Fuji management to proactively convey conservation messages to a 'noncaptive' audience including many young, novice and foreign climbers. Hence this paper aims to review i) the management structure and ii) the foreign climber market, thereby drawing suggestions toward a conservation strategy for Mt Fuji's foreign climbers.

## Managing Mt. Fuji's natural and cultural resources

Resource management is often fragmented, and Japan's 'mixed management' system of national park administration is no exception (Hiwasaki, 2005). The Ministry of Environment is the legal park administrator, but faces a number of impediments to holistic management, including lack of land ownership, and insufficient funding and human resources (Imura, 2005). Other central governments are also involved, such as the Forestry Agency which is a significant landowner, but their institutional objectives are not always consistent. Meanwhile designated parkland also overlaps with the administrative territory of 15 municipalities, as well as the two Prefectures of Shizuoka and Yamanashi (MoE, 2000). This complex combination of stakeholders can have the unintended side-effect of pitting government agencies against each other, and against private stakeholders such as the mountain huts who maintain the trails and the Shinto shrine that claims 'ownership' rights over the summit. Unsurprisingly there have been serious discrepancies in the provision of visitor services, undermining attempts to implement management interventions.

However, the recent calls for Fuji's UNESCO designation may have ushered in a new era of cooperation, as demonstrated by a new system of trail signs after a partnership council was formed in March 2009 from a cross-section

of stakeholders. The partnership issued a set of guidelines aimed at standardization of place names, and the removal of unnecessary or low quality signs. The outcome was a simplified system of colour-coded signs along the four main trails, reducing confusion such as one notorious junction on the descending trail where climbers often lost their way and descended on the wrong side of the mountain. The trail signs thus represent the new spirit of cooperation, and have since been introduced in a multi-lingual format that underlines the increased presence of foreign climbers.

## Mt. Fuji's foreign climber market

Fuji's international climbers are a segment that has grown rapidly in recent years, although it is still estimated to be less than 10% of the overall market. Nonetheless, management of foreign climbers is a priority for a number of reasons. Firstly, Fuji's global level of recognition is second to none, but language and etiquette barriers on the mountain risk undermining climber experience. More broadly, Fuji is a market leader for Japan's national parks and protected areas, hence strategies implemented here are a de facto benchmark for resource management across the whole country.

Monitoring was conducted every August from 2008–2012, when an English language questionnaire was distributed to climbers descending the Yoshida route, the busiest of the four main trails. Results indicate that male climbers in their 20s from Europe and North America dominate. Almost half live in Japan, and 60–90% use public transport to reach Fuji's 5<sup>th</sup> station. >90% are first time climbers, and around 80% reach the summit, mostly arriving in time to see the sun rise by not stopping off en route (61%). Climbing information is gleaned from off-site sources, notably the internet and guidebook. On-site information ranks lower, with other climbers more likely to be used than trail signs. Trail signs are playing an important role, but warning signs overshadow those that explain natural or cultural features. Hence although 23% of foreign climbers were motivated to come to Japan by culture or tradition, climbing Fuji is treated as a physical challenge or social adventure, and there is little evidence of heritage perception. Only 37% would be interested in joining an Interpretation Program at the 5<sup>th</sup> station, although 57% felt the need for an improved Visitor Centre.

## Toward a conservation strategy for Mt Fuji's foreign climbers

This paper outlines Fuji's management structure and the foreign climber market to discuss implications for a communication strategy based on proactive conservation. As in many protected areas, Fuji management is complicated by its fragmentation, but a simplified system of colour-coded

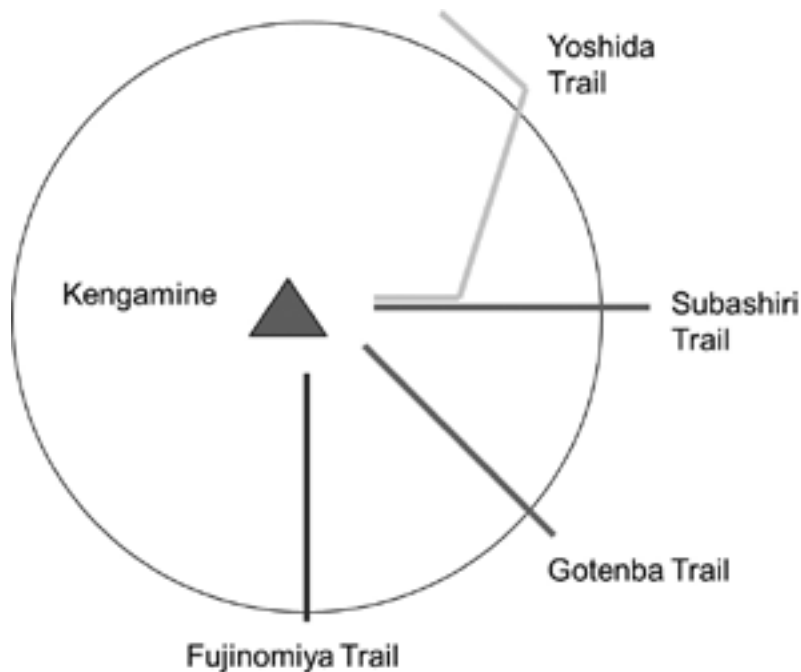


Figure 1. Colour-coded trail system set up in 2009.

signs along the four main trails represents a new spirit of cooperation. However, in terms of modifying the behavior of the target segment, ongoing monitoring suggests off-site channels (especially the internet) would be more effective than on-site ones, although the importance of trail signs is not merely symbolic as analysis shows a predominantly self-guided market. Nonetheless results point to necessary adjustments in trail sign content that can deliver heritage messages effectively, without over-emphasis on utilitarian functions such as warning notices. Given the 'noncaptive' nature of the audience, such natural and cultural heritage interpretation must be enjoyable and relevant (Ham and Krumpel, 1996); it could be complemented by integrated messaging on public transport in tandem with an improved Visitor Centre.

Unlocking the potential of 'mixed-management' parks require cross-cutting partnerships with the capacity for targeted management interventions. It is hoped that the 'carrot' of UNESCO designation can provide a platform to unite diverse stakeholders around such a common vision.

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# Landscape interpretation based on the example of the Ljubljansko Barje nature park (Slovenia)

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The Ljubljansko Barje is a large wetland plain spanning 150 km<sup>2</sup> on the doorstep of Ljubljana, Slovenia's capital city with almost 300,000 inhabitants. The mosaic-like intertwining of different habitats offers shelter to numerous plant and animal species; however the peaceful coexistence of man and nature has been rapidly dissolving in the last few decades.

The relatively fast sinking of the southern-most part of the Ljubljana Basin on the juncture of the Dinaric and Alpine plate thrusts transitioning from the Pliocene to the Pleistocene was key for the formation of Ljubljansko barje. The Sava River deposited large amounts of gravel, which caused the Ljubljanica River to dam and flood the entire marsh basin. Millennia of river alluviums slowly filled the lake and the water drained until a crannog lake dried six thousand years ago, enabling the formation of a large marshland, and a low and high bog later. The special conditions allowed for peat to grow.

The first major interventions on Ljubljansko Barje date back to the Roman times. They only continued in the eighteenth century, when the first extensive melioration works started in the bog. Therefore, Ljubljansko Barje is not a "real" bog in the true sense of the word, as remnants of the high bog only appear here and there and peat covers less than one percent of the surface.

The first conclusions on the need for a protection of the "bog park" was expressed as early as 1920 in the Memorandum, presented to the former landscape government by the Section for Nature Conservation and Conservation of Natural Monuments with the Museum Society of Slovenia. The true worth of Ljubljansko Barje and its natural and cultural values has only started to be recognized in the last few decades. In autumn 2008, the area was declared the Ljubljansko barje Nature Park with a Decree in order to "protect the natural values, preserve the biotic diversity, and strengthen the landscape diversity", and the two sites of prehistoric crannogs near Ig were included on the Unesco world heritage site list in 2011.

One of the purposes of protected areas, especially nature parks, is the interpretation of the natural and cultural values. The term interpretation was scarcely used in Slovenia until recently and has not yet been widely recognized.

However, the road from the protection of the park to realizing its purpose and goals is usually long and winding. For this reason, we have begun to design certain interpretative contents.

The goals we set when creating the interpretative contents were to focus more visitor flows to the less vulnerable areas, to encourage the visitors to take on the responsibility

of caring for nature and the cultural heritage and to increase the amount of sustainable selection in the protected areas, thus increasing the visitors' satisfaction.

The presentation of natural and cultural values in the form of an interpretative trail has proven to be one of the most popular forms of interpretation. Interpretative trails are no rarity in Slovenia, but they rarely follow the principles of interpretation. Sensibly designed interpretation mediums could be beneficial for the protected areas: it would create excitement and pride as well as a feeling that it is necessary to help, to direct visits, increase the public support to the manager, increased influx and revenue. The interpretative trail will therefore not be the objective, but a means, a tool for managing the park. One of the first steps toward the set goals was to design a form, in which we position the area geographically, give a brief description, point out natural and cultural values, inform about the near-by infrastructure, and put special emphasis on the issue, goals, and the interpretation contents. In addition, we include a cartographic display and list of the literature.

We filled the form with a theoretical and field overview of the area and selected 15 areas that were suitable for interpretation. The selected contents range from purely natural science perspectives to cultural ones (zoology, vegetation, geology, relief, hydrology, archaeology, masonry, folk knowledge, and more). The interpretation areas are quite evenly spread throughout the entire nature park; here, we circumvented the most strictly protected areas.

By designing interpretative trails and other interpretation contents on the area of Ljubljansko Barje Nature Park, we do not wish to drastically increase the number of visitors to the protected area, even though we do not necessarily see this as problematic if it is planned well and in accordance with the existing infrastructure. Research namely shows the number of visitors is not the deciding factor in burdening a certain area, but their "quality" or awareness. This quality can only be achieved with education, especially through the interpretation media.

Protecting Ljubljansko Barje as a nature park was undoubtedly a measure in the right direction, but merely protecting it will not suffice. Protection actually means interaction with people to the greatest extent, who need to have the park and nature brought closer to them.

The positive effects of the forming interpretation regulations' effect on the general development of Ljubljansko barje will:

- raise the general culture and the locals' awareness about their environment,
- raise the quality of the recreation space and help the



Figure 1. 15 selected areas suitable for interpretation in Ljubljansko Barje Nature park.

visitors to get acquainted with the area and experience it better,

- raise the locals' and visitors' interest for the area and with that an increased need and care for preserving this area.

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## ORGANIZED SESSION: ORAL

## Risk, safety and conflict in a changing outdoor arena

Session organizer: **Rebecca Stenberg**, Linköping university/CARER (Center for Advanced Research in Emergency Response), Sweden, [rebecca.stenberg@liu.se](mailto:rebecca.stenberg@liu.se)

Climate changes are giving way to new landscapes, seascapes and “icescapes”, and we have to plan for and cope with new kinds of weather anomalies. In addition to that, we also experience demographic changes such as an aging population in the Western World, a diminishing familiarity with outdoor life, and values that are changing from the creation of shared activities into events to consume. In turn, this leads to changes in the outdoor risk panorama and points to an increasing need for knowledge about risk, safety and rescue issues in outdoor recreation.

Risk research as well as research in safety and rescue, are established research fields which are applied in some areas of outdoor recreation but not in others. Much attention has for example been given to risk assessment, risk analysis in adventure sports and tourism and risk construction and risk management internationally. There is also a body of technical research and development of safety devices such as smart phone applications, transponders and GPS-functions, and of medical knowledge on topics such as human endurance and performance, illness and layman first aid in cardiac conditions. Other outdoor safety fields in need of knowledge development concerns both experiences, methods, suggestions and future questions in for example the following fields:

- Safety aspects of the Nordic “friluftsliv” with its prerequisites of open country access and the condition of outdoor activities “at your own risk”.
- How outdoor risk and safety are constructed and expressed in social media and how technology influences patterns of risk and safety in outdoor activities.
- Outdoor rescue activities and development, such as self aid, first responder aid and cooperation with the rescue system.
- Changes in risk panorama and rescue conditions.

We therefore welcome presentations in these fields or related topics from academic as well as practitioners’ perspectives.

# Daring Dan and Mrs Dull – The reciprocal construction of heroic risk and dull safety in organized outdoor activities

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**Jan Insulander**, Friluftsrämjandet, Sweden

In an incident reported on the social website Skridskonätet (a site for tour skaters) February 8, 2012, a group of highly competent tour skaters went through the ice at the same time and in the same place at high speed – a potentially dangerous situation – on the sea ice in the Stockholm Archipelago. They all re-entered the ice nearly as quickly as they went through it.

This incident, which was the consequence of going too fast, on unknown ice, not following established safety routines, was reported as a glorious, comic adventure and commented in the same style by other skaters. This kind of reporting and the reactions to it, including the absence of outspoken critique, push the meaning construction of what outdoor safety is all about, into a drama with two standard stereotypes; The risk taking (young male) hero Adventurer, and the risk avoiding, (older and more feminine), perhaps wiser but boring, non-adventurer.

Here it is shown that they are both stereotypes in the drama of a reciprocal process of interdependent social identity construction which often leads to polarization, conflicts, and in the case of outdoor, to the downplay of safety. It is suggested that polarization can be avoided by a strategy built on reconceptualizing based on inclusion.

Recent research (Beech 2008, Faber & Mayer 2009) defines identity as a sense of identity due to active intrapersonal processes – identity work. It comprises managing the “inside”, intra personal processes, in negotiation with outside actors and contextual factors. Thus identity is an ongoing and changeable construction, a narrative of whom we are and why, which gives meaning and sense to our life-projects.

According to Beech (2008) the negotiation of the identity is related to expectations and frame of reference, and therefore strongly influenced by stereotypes and archetypes (Jonas et. al 2003). The latter meaning not only story characters but easily recognizable prototypes of personality or character, operating more or less unconscious. Both are often used in media reporting strategies (Davidson 2008). Typically such polarization can be found in classical dichotomies of good guy/bad guy, winner/loser or adventurer and non adventurer as well as in other fundamental strategies of making sense of what we call reality. A sense of identity, or the lack of it, is therefore central to how we understand and act on changes and challenges (Jonas et.al. 2003).

A classical stereotype to identify with in the outdoors and in media is the Adventurer (Elsrud 2001, Jonas et.al. 2003, Faber & Mayer 2009). This archetype is a courageous risk taker, action oriented and male. In order to visualize the Adventurer, the background (audience) must be contrasted as not courageous or risk taking but passive and female,

which all are characteristics the proposed Adventurer must dissociate himself from (Elsrud 2001).

Claims or proposals for an Adventurer identity can therefore (Beech 2007) meet at least three possible reactions: Confirmation, demands for negotiation/refinement of the identity construction and rejection. Both Beech (2008) and Jonas et.al.(2003) points to that any of the reactions could be initiated by, or come from any of the actors, giving rise to the following variation of possible reactions in a dialectic identity process.

As long as the proposed adventurer and the audience agree on the identity claims or the rejections, everything is fine. But when the proposed adventurer and the proposed audience disagree, or are ambitious on their respective identity claims it will lead to negotiations of meaning or to conflicts. An example is when tour skaters don't want to be reduced to a passive audience to spectacular adventures they haven't taken part in, and reject the adventurer's claim of being adventurous. Instead his or her identity will be re-assessed, perhaps to a jester, and the person's lack of judgment is deprecated. The proposed adventurer in turn, challenges the others resentment as dull and cowardly, perhaps taking even greater risks in order to make a stronger claim to his identity as a real adventurer.

Struggles over the adventurer identity in organized outdoor activities often lead to tension and conflicts about the code of conduct and safety rules in the organization. Another important consequence is the downplay of the importance of risk awareness and safety work since safety symbolically represent the not adventurous. A striking example can be found in the symbolic avoidance of the use of malaria blockers among backpackers concerned about their identity as “real” adventurers in contrast to the identity as regular tourists (Elsrud 2001).

The identity process thus becomes more of a polarization process with readjustments to readymade, stereotyped identities, just as in the reported incident. In the field of politics, a similar phenomenon can be found in the polarization between moderation and extremism. Based on how British Islamic groups holds extreme standpoints both in moderation and radicalism, Hopkins & Kahani-Hopkins (2009) found these polarized categories of little use in both theoretical understanding and practice. They suggest reconceptualizing of the categories by choosing perspectives and by changing the frames of references, into alternative practice taxonomies based on inclusion instead of exclusion. Thereby it would be possible to transform the social identity processes from polarization to inclusion,

The conclusion here is that identity construction practices easily turn into polarization processes inspired by media



Table 1. Identity construction process

	<b>Audience propose</b>	<b>Audience confirm</b>	<b>Audience reject</b>
<b>Individual propose</b>	Negotiation/refinement	Agreement	Polarization/conflict
<b>Individual confirms</b>	Agreement	Agreement	Polarization/conflict or acceptance
<b>Individual rejects</b>	Rejection/conflict	Abdication/involuntary identity or rejection/conflict	No issue

stereotypes and archetypes. In the case of the construction of an Adventurer identity the polarization can lead to conflicts and the downplay of safety issues.

To avoid polarization in the identity construction process, one suggestion is to go beyond

obvious dichotomies in the identity work and find criteria for inclusion.

Applying this suggestion on the reported incident, instead of blaming the irresponsible Daring Dan and his friends, it is possible to identify constructive contributions to the shared safety culture among tour skaters, where reports from mistakes and close calls are important sources for identifying safety hazards and facilitate learning. By reporting this embarrassing incident the skaters showed their respect for this shared policy and contributed with their experiences and reflections. Implicitly, they also contributed with their tacit expectations of others to do the same,

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# Model of high-mountain hiking trails (*via ferrata* type) in Tatra National Park – A comparison between Poland and Slovakia in the context of the Alps

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The main concern of trail management in protected areas is to minimize its environmental impact (Marion & Leung 2004). Usually, four groups of indicators are mentioned as determinants for successful trail management: Apart from environmental indicators, there are political, economic and social variables (O'Connor Gotra & Boyle 2006). There are, however, relatively few studies on the management of high-mountain trails where the factor of safety and risk management is of crucial importance in planning and managing. Also, the extent of park managers' responsibility needs to be ascertained (Eagles, McCool, Haynes 2002).

Hiking trails in high-mountain environments often leading through steep slopes and cliffs as well as sharp ridges. Consequently, these routes are frequently equipped with different "facilitations", such as ladders, chains, fixed ropes, buckles and bridges. These "facilitations" are designed to aid movement in difficult rocky terrain as well as enhance the self-protection of visitors. The latter requires usage of special equipment, such as helmets, harnesses and lanyards with energy absorbers. The number of facilitations, level of difficulty, skill level required by visitors, as well as the regulations concerning risk management, accessibility and nature protection vary significantly between particular trails.

The first trails of this type, called *via ferrata* or klettersteig, were constructed in the Italian Dolomites. Nowadays, there are many *via ferratas* throughout the Alps and in other European mountains. There are also a few sections of such trails in the Tatra Mountains, the only high-mountain range in Poland and Slovakia. These areas are protected as a national park (1949, 1954), biosphere reserve (1992) and Natura 2000 site (2004). *Via ferratas* comprise approximately 2% (20 km) of the total length of hiking trails in the Tatra Mountains. The only long-distance *via ferrata* is Orla Perć (Eagle Path), which was established in 1903-1906. This trail is part of Polish cultural heritage and attracts numerous tourists.

Visitor flows on the most frequently visited high-mountain trails in the Polish Tatra can exceed 500 people per day (monitoring carried out in 2010), which poses a real threat to visitor safety. The number of visitors on trails in the Slovakian Tatra is significantly lower. Due to the high number of deadly accidents on *via ferratas* (reaching 20 people in the last decade), there is on-going debate on how best to manage these trails. The national park managers, tourists' organizations, rescue service, mountain guides' associations and local authorities are involved in this decision-making process. Risk management in protected areas in Poland and Slovakia has not been an important issue so far, thus there is a strong need for scientific support for this process.

The aim of this study is to analyse key parameters of the management of high-mountain trails in both countries (fig. 1). The environmental factor is comparable; all *via ferratas* are located in the core zone of the national park with the highest level of nature protection. This restrains the possibilities of enhancements of existing trails and establishing new ones, although local authorities typically want such expansion because it can attract more visitors.

The legal regulations seem to be the crucial determinant. According to Polish law, national park managers are responsible for visitor safety, whereas in Slovakia the extent of responsibility is not formulated so strictly. This results in differences in the management model for high-mountain trails. Typical high-mountain trails in Poland are fully equipped with chains and buckles, while in Slovakia such facilitations are significantly sparser. However, both models do not allow proper visitor self-protection. The chains (as opposed to fixed ropes) are not designed to be used with lanyards and energy absorbers. The latter model is popular in the Italian Dolomites and on many *via ferratas* in France and Germany. In Slovakia the adequate safety level is ensured by the obligatory assistance of a mountain guide, however, this strategy is questionable. The required use of guides is also lobbied for by mountain guide associations in Poland and these groups seek to change the high-mountain trail model and replace chains with fixed ropes. While this change may improve visitor safety, it will also attract more customers for mountain guides. There are also different protocols for the rescue service in both countries. All rescue actions in Poland are financed by the national insurance. In Slovakia an additional insurance policy is necessary, thereby placing more responsibility directly on the visitor.

One of the main obstacles in changing the model of high-mountain trails is the lack of support from tourist organizations and individual visitors. In a simple poll conducted on the national park website, most respondents expected to maintain the existing model. The national value of such trails and an apprehension of limited accessibility of the high-mountain trails were frequently offered as an explanation.



Figure 1. Determinants of the high-mountain trails management

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# Car traffic in a national park: visitors' perceptions and attitudes

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## Introduction

National parks provide important yet sometimes competing landscape functions such as the protection of natural resources as well as recreation opportunities. As visits to these areas continue to increase or at least be maintained at a high level, demand for access and use can damage the ecological integrity of sensitive environments, reduce the quality of visitor experiences, and generate conflicts among stakeholders regarding appropriate management responses. A sustainable tourism concept requires area managers to provide opportunities for high quality visitor experiences and to preserve natural environments protected from negative tourism-associated resource impacts (Cahill et al. 2008). Impacts on the experience quality between recreationists employing different recreation activities in protected areas are often asymmetrical (Manning 1999). Visitors may feel disturbed because the social goal and behaviour of those encountered interfere with their own motivations. Research has found potential conflicting encounters between different visitor groups (Jacob and Schreyer 1980). Human elements in a predominantly natural landscape have been found to be more acceptable if the components are perceived to fit into the settings (Behan et al. 2001). In these environments individuals are expected to be disturbed by different kinds of noise (Marin et al. 2011). Research findings showed that human-caused noise detracts from the quality of the visitor experience in natural areas. In this context, it is expected that an interaction of different types of recreation activities (e.g. motorised visitors and hikers) are the sources of potential user conflicts. For example, studies in Scandinavia have demonstrated that when skiers encountered a snowmobile their experience quality was significantly reduced (Vittersø et al. 2004). Car-based tourism in national parks is an example that is expected to degrade the area's naturalness, create conflicts between different user groups and interfere with existing types of recreational uses (Tarpinian 2010). Against this background, the study evaluates (a) visitors' perceptions and of area density and (b) attitudes towards car traffic in a popular coastal national park in Germany by applying an on-site survey. The trail conditions were depicted by digitally manipulated images, displaying combinations of different use levels with various visitor numbers and presence of car traffic on trail.

## Study area and methods

A case study design is applied in a popular coastal national park in Germany, namely the Wadden Sea National Park to evaluate how visitor characteristics such as experience, motive and type of activity may influence the evaluation of recreation conditions. In an on-site visitor survey (N=509), we used questionnaires in conjunction with a set of digitally modified images that showed a range of density levels

of car traffic on a trail to an island. The empirical data has been collected on the Hamburger Hallig, located within national park territory. The whole area is part of Zone 1 ("Wild area with no public access") of the National Park and an important breeding area and resting ground for seabirds. The Hallig is approximately 50 ha in area and is connected with the mainland by a 3.5 km causeway, which is open for car traffic. The island (which is partly excluded from the prohibition of access) can be reached easily from the mainland and constitutes an important destination for day trips. The main tourist activities during the season are hiking, cycling, bathing and bird-watching. The questionnaire was developed to obtain quantitative data about the sample population's characteristics and attitudes towards social conditions on the trail and potential conflicts between hikers, cyclists and car traffic.

## Study results and discussion

Results show that the presence or absence of a car in the scenario has the greatest influence on overall scenario ratings. Overall, respondents seem to prefer low use levels and the absence of car traffic on the trail to Hamburger Hallig. The crowding ratings strongly increase when use level is high and car traffic is combined in the scenario. An implication of study findings is that there is no obvious inter-visitor conflict between hikers and cyclist on trail. The presence of car traffic was the most influential attribute for all respondents and influenced conflict perception remarkably. A comparison of visitor groups shows that first time visitors and cyclists are less tolerant of the presence of cars than frequent visitors and hikers. The study results indicate that the presence of cars on the trail to the Hallig seems to negatively affect non-motorised visitors' ability to attain recreational benefits. Most of the visitors expect a nature experience and annoyance from car traffic may not be part of their anticipated experience. Limitations of our study are that (a) some salient attributes have been ignored and thus not been included in the study design and (b) the local context within which the experiment took place. Further research might include the attitude of motorised visitors and their acceptance of potential management measures such as a strict use limit for car traffic on the trail. In addition, computer animated scenario presentations could be applied to integrate motion-related factors (Reichard and Arnberger 2010). From a management perspective, social carrying capacity of the study area can be described as an asymmetrical conflict of interest between motorised and non-motorised visitors rather than as an absolute conflict over the number of visitors to the area.

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# Ski touring on ski slopes – Problem or opportunity?

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## Introduction

Within the last few years, ski touring has become an increasingly common form of outdoor recreation. In this context a new trend has emerged: ski touring along ski slopes. In Austria and Germany, the increasing number of people ascending on ski slopes, even during night time, has resulted in conflicts between ski tourers on one side and the cable car enterprises and alpine skiers on the other side. Consequently, in some areas, especially around big cities, slopes have been closed for ski tourers and these conflicts have been frequently discussed in magazines and newspapers, including the following portrayals:

- “pist walkers”, especially at night, destroy the newly groomed pists,
- many “pist walkers” don’t obey the FIS rules and put the alpine skiers in jeopardy of collision risk,
- “pist walkers” use the infrastructure, such as toilets and parking lots, mostly without paying,
- after the closing of the cable car, the “pist walkers” risk their lives because of the grooming activities at night
- the complex liability situation, that differs in each Austrian province, leads to further misunderstandings.

Some ski resorts have already established management measures including rules, information strategies, establishment of designated ascending trails, ski tourers evenings, parking fees or bans.

So far the number and motivation of people ascending on ski slopes is largely unknown. This study examines this new trend through a survey of athletes and operators in two ski areas.

## Methodological approach

In two Austrian ski resorts in close proximity to big cities, people ascending ski slopes were counted and given questionnaires. During days with perfect weather conditions up to 140 people were counted within 3 hours in the ski hut, during ski tourers evenings more than 200. The return of questionnaires was 86,9 percent.

## Selected results

Overall the study shows that one segment of the ski tourers uses this activity to start alpine ski touring in unsecured open areas. There are many beginners (24 percent less than 2 years) as well as experienced athletes (24 percent more than 10 years). The majority of the people ascending on ski slopes are used to go backcountry skiing and most use ski slopes only if there are improper snow conditions elsewhere.

As figure 1 shows, “exercise” and “health” are the main motives for people ascending on ski slopes. The most important reasons for using pists compared to the alpine terrain are “no avalanche danger” and “appropriate conditions”.

Especially women, who are a minority among the “pist walkers” (27 Percent) and newcomers appreciate the safe conditions on ski slopes.

Similar to indoor climbers, who favour rock climbing (Hindinger und Pröbstl 2011) almost all the “pist walkers” don’t stay on ski slopes but already go, or want to go to the alpine terrain.

The results of this study suggest that the ski tourers are not very aware of wilderness areas (Sterl et al., Rupf et al. 2011) and many of them have already experienced hazardous situations (17 percent in the alpine terrain, 2 percent on ski slopes). Therefore further information and training for this group of athletes is required by the alpine clubs.

The study also shows that management measures could reduce conflicts between downhill skiers on the slope and ascending athletes. Furthermore management actions may contribute to increasing the willingness to pay for certain services such as parking lots along with changing the acceptance of the “pist walkers”.

Through appropriate management actions, this new group of recreationists can be attracted by a challenging and safe new experience offering.

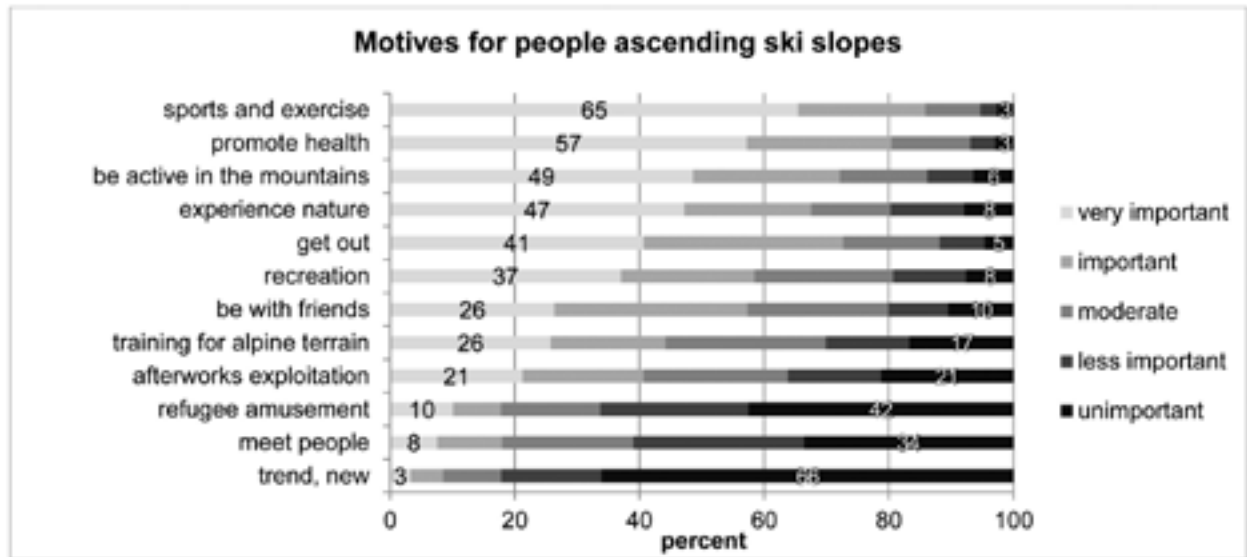


Figure 1. Motives of people ascending ski slopes (n= 508)

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# “TRYG i naturen” – research in risk and safety related to outdoor recreation and education (*friluftsliv*) in the coastal regions of Denmark

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## Background and aim

In Denmark there is a lack of research within risk and safety connected to the field of outdoor recreation and education – *friluftsliv*. Accidents are registered by different organizations but are not subject to further analysis, and focus seems to be on fatalities only. The general understanding and practices connected to risk and safety in the outdoors seem to be based on tradition, prejudices and common sense rather than on evidence.

Several newer studies indicate strong links between health and participation in leisure activities in the outdoors. Risks and accidents in the outdoors may on one hand be seen as an attraction especially for young people's participation and on the other hand as a constraint for participation.

The project “Safe in nature” aims to identify patterns of accidents, including near-misses, within three selected activities in the coastal regions – seakayaking, kitesurfing and dinghysailing. The three selected activities are selected as representatives of different cultures in outdoor recreation and education with different traditions and practices related to risk and safety.

## Design and methods

The study integrates quantitative and qualitative methods using document-study as well as case-studies with use of survey and qualitative interviews. The first part of the study aims to form an overview of risk and safety related to outdoor recreation and education in the coastal regions in Denmark. Already existing statistics and registrations from different organizations and institutions are being analyzed. The second and central part of the study is a case-study trying to identify the safety-culture or -profile of the selected activities – seakayaking, kitesurfing and dinghysailing. This part involves a quantitative survey among participants in the selected activities followed by qualitative interviews with groups of participants. The collection of data is being analyzed intending to identify a specific safety profile connected to the specific activity and culture of *friluftsliv*, which might on one hand help to understand patterns of accidents and on the other hand help form strategies to improve safety.

The third part of the study involves an international comparative perspective with a minor study focusing on organization, risk-management and strategies related to risk and safety in the outdoors in New Zealand and Australia. Results are being discussed in a Danish context. This part of the study will not be included in this presentation.

## Results

### First part

In the first part of the study we concentrate on the period of 2005–2010. The reason for this is simple and relates to the lack of consistent data related to accidents and rescues before this period. Results from the ongoing study indicate that the development in accidents does not follow the general development in outdoor recreation and education – *friluftsliv*. Patterns of accidents seem to be rather complex, involving socioeconomic standards and seem to be closely related to the culture of outdoor recreation and education – *friluftsliv*.

The results show a general decline in the numbers of near-misses but a stable level of accidents related to *friluftsliv* and outdoor activities in the coastal regions (bathing and swimming not included). Within the selected activities – seakayaking, kitesurfing and dinghysailing – there seems to be interesting differences in the proportions of incidents, near-misses and fatal accidents. There appears to be many accidents and near-misses related to sailing and fishing, and many false alarms especially related to kitesurfing.

### Second part

The three selected activities of *friluftsliv* – seakayaking, kitesurfing and dinghysailing – are different in a number of ways, – i.e. age, gender, education, socioeconomic status. Results from survey and interviews show that the three groups seem to have different consciousness, focus and behavior related to risk and safety.

The ability to perform a self-rescue in case of capsizing seems to be vital and to relate to the attitude and behavior related to safety. It is suggested to understand the results as a *chain of safety* involving 5 elements. The three selected activities seem to represent different safety profiles according to this chain (figure 1).

## Conclusions

The study points out that safety related to *friluftsliv* in the coastal regions cannot be related to or reduced to one single factor – but rather has to be understood as a *complex pattern*. The study points out the importance of taking a *holistic or cultural approach to risk-management* involving a deeper understanding of the traditions, the context and the taken for granted thinking and behaving related to a specific culture. The study is focusing on outdoor recreation and education – *friluftsliv* – in the coastal regions of Denmark.



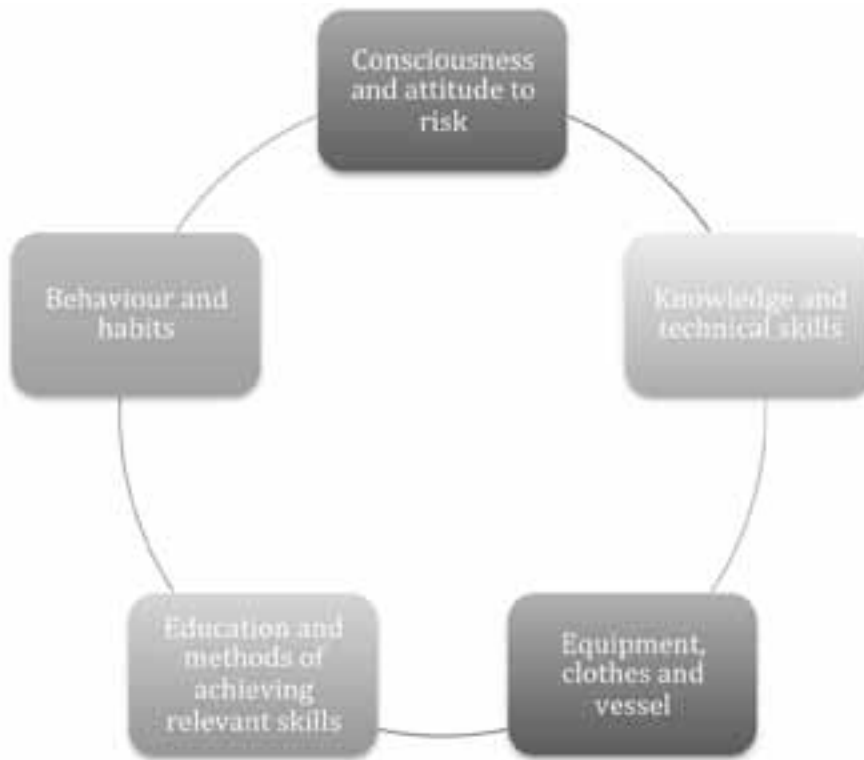


Figure 1. Chain of safety

It can however be discussed whether the results can give indications or perspectives to other ways of understanding and managing risk and safety in *friluftsliv* in general.



## ORGANIZED SESSION: ROUND TABLE

# Estimating and integrating the values of tourism and recreation visitation to parks and protected areas

Session organizer: **Jack Carlsen** and **Michael Hughes**, Curtin Sustainable Tourism Centre, Western Australia, [j.carlsen@curtin.edu.au](mailto:j.carlsen@curtin.edu.au)

The declaration of protected natural areas was historically based on preservation of unusual or distinctive natural phenomena, natural resource protection and opportunities for public recreation and tourism. Since the 1970s, the management focus of protected natural areas has shifted toward nature conservation or preservation in recognition of the ecological value and environmental values of the areas being protected. While now protected for ecological conservation, the continued and increasing popularity of these areas as places for recreation and tourism has generated significant social and economic value for the regions in which they are located. There are also universal values that have been recognized by UNESCO in nominating and declaring natural world heritage areas. Thus, there has emerged a range of ecological, socio-cultural, economic and universal values associated with parks and protected areas that have to be clearly understood by researchers, protected area managers and policy-makers to better inform optimal decision-making for policy, planning and management.

This roundtable will be a discussion of the identification, quantification and integration of the full range of parks and protected natural area values around the world. It could include discussion of the typology of economic, social and environmental values and how these have been identified, measured and presented. There is also a need to integrate the full range of values into a data-base of protected areas. Understanding the full range of values and development of an integrated database will better inform optimal decision-making for protected natural area policy, planning and management. In developing a detailed understanding of the values of protected natural areas and agreed methods for assessing these values over time, the roundtable discussion will engender an approach that recognizes the net benefits to society of monitoring and maintaining these places for present and future generations.

# Myplacetobe.eu – A smart way to collect landscape preferences

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## Introduction

According to the prognosis of the United Nations World Tourism Organization (UNWTO), 2012 will be a record-breaking year as 1 billion international tourist arrivals are expected worldwide. For many decades, the traditional European natural areas and landscapes have been amongst the most popular tourist destinations. This worldwide growth in tourism is one of the reasons European policy makers are considering tourism as a significant sector for rural and/or regional development. At the same time, the purpose of the European Landscape Convention (ELC) is to promote landscape protection, management and planning of European landscapes. Europe has beautiful landscapes to offer but a lot of tourists don't know these destinations. Do we have to promote these unknown places or to protect them, or doing both in a sustainable way? The balance between protection and development of the landscapes is a challenge in Europe. In many European studies (Leidner, 2004, Wascher et al, 2008, Maes et al, 2011) scientists are trying to prove the relationship between certain types of landscape and the (potential) amount of visitors in order to give objective impacts of development. But on European scale there is a lack of data concerning preferences from tourists for certain types of landscape. The alternative in many studies therefore is to use the amount of beds and overnight stays. In Europe the amount of beds and overnight stays are collected at NUTS level; large geographical scales. Those scales are not detailed enough to find relationships between types of landscape and visitors preferences. The central question therefore is how to collect landscape preferences data without using traditional inquiries which are very costly?

## Method

We introduce the concept of smart landscape. Smart landscape is about thoughtful planning and connection of divers systems of physical features, users and services in an area. With smart planning and cooperation it is possible to develop sustainable spatial use and quality of life in the future against low costs. In smart landscape the use of a good chain of knowledge (data -> information -> knowledge -> wisdom) is essential. It can create advantage with respect to other areas that are not using the concept of smart landscape. According to McKinsey & Company (2011) 'big data' will change the economy radically. Big data will be the basis for innovation and competition. It is also cost-effective because data can be changed much quicker into relevant information. Smart landscapes use new technologies. New technologies give in abundance possibilities of anticipating on the experience economy we are living in. In an era where society is making vast information resour-

ces available to anyone, at any time, from anywhere in the world, competitiveness of tourism destinations and regions increasingly depends on timely access to the right information. With this huge information supply modern visitors coordinate their own needs and preferences and finely their travel destination.

We develop e-SCAPE as a smart landscape tool; an Electronic information system for landScape preferences. It consists of:

1. a large GIS database of European land use and other touristic important data
2. a website [www.myplacetobe.eu](http://www.myplacetobe.eu)
3. a database with individual preferences and personalized maps.

The website [www.myplacetobe.eu](http://www.myplacetobe.eu) was developed to enable Internet users from all over the world to locate their own preferred travel destinations in Europe according to their landscape preferences, using all kinds of digital topographical data. The users can fill in how much they want of certain landscape types and supplemented features. The application draws a personalized map of Europe which indicates where the European landscape corresponds closest to the user's stated preferences. Using Google Maps, it is possible to zoom in on the map and getting more tourism information about that destination. All preferences and maps are saved in a special database.

## Results

Results from the European version are yet limited, because it is still a beta-version. Till now there are about 10.000 visitors, mostly from The Netherlands (16%), but also from Canada (12%), The United States (11%) and France (6%). The "visitors" are mostly search engines. Till now we have a database with preferences of 96 real visitors making 345 maps. More results are available from the Dutch version. Each day there are 150 visitors on the Dutch website ([www.daarmoetikzijn.nl](http://www.daarmoetikzijn.nl)) creating a database at this moment of 35.000 unique visitors with their preferences and maps of the Dutch landscape. This database is growing every day without any costs. Most preferred type of landscape of the Dutch is the forest. Most preferred type of landscape of Dutch speaking Belgians is heath (Goossen et al, 2011). The most important result is that people want a diverse landscape; build upon different types of landscape. If they have a lot of a certain type of landscape in their environment, they want less of that type. If they don't have a lot of a certain type of landscape, they want more of it. On the website visitors can give a score for the attractiveness of the landscape around their place of living. The average is 6,9 at a 10-point scale. Using a stepwise multiple linear regression

analyses, the attractiveness score can be for 52% predicted with most of the types of landscape.

About 6.000 visitors have left their email to participate in following research concerning recreation, tourism and landscape. About 625 of them participated in a research about their actions after they received their destination recommendations. Results shows that 30% of them actually visited the destination which was recommended and 54% of them made an overnight stay.

## Conclusions

This database gives opportunities to analyze the data in impact and assessment studies on every national and regional scale in Europe. The database gives answers to questions like what the location of the most preferred European landscape is, are the Natura 2000 sites preferred tourism destinations, which European region do people from Sweden most prefer and which tourists prefer Cornwall in England the most? In a partnership with European institute (universities, DMO's and the tourism industry) this database can be used when it has reached a certain amount of visitors. Hopefully it will give answers to the question whether policy makers and managers have to develop or protect landscapes.

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# Rhetoric and sense of place: Implications for tourist destination management

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Researchers using interpretive methods to study sense of place and place attachment in outdoor recreation and tourism contexts typically derive place meanings by applying content and thematic analyses to interview-based textual data. In such cases, data are collected using personal interviews which are subsequently transcribed and analyzed for expressions of subjects' senses of place. Such content-based approaches, however, tend to ignore other kinds of communicative data (spoken, written or non-verbal) in outdoor recreation and tourism settings, and fail to utilize other types of discourse analysis methods that might reveal new aspects of place meanings. This paper aims to extend traditional approaches to place attachment and sense of place research in the context of community tourism development by offering a rhetorical analysis of comments freely written by respondents on return-mail questionnaires. These data – commonly available, but rarely studied for their discursive qualities – may offer new opportunities for researchers to more fully analyze respondents' place meanings so as to better plan and manage tourism destinations.

Data for this interpretive study were obtained from a mail survey of permanent and seasonal residents in four Vermont (USA) tourism towns. The overall goal of the original survey project was to assess people's ties to community and to natural and built environments in their Vermont towns. As is common in survey research, respondents were invited to share additional comments in any unprinted spaces on the questionnaire form. The freely-written comments provided on the front and back covers and on pages inside the questionnaire (excluding written comments associated with specific questions, such as those with "other" categories, or open-ended questions) form the corpus of writing used in this rhetorical analysis. These textual data include written comments on 147 questionnaires (27% of 544 returned), and represent nearly 500 separate entries. Comments ranged from single words or phrases to short stories and short essays. About one-fifth of the comments were lengthy (multiple sentences to multiple paragraphs), and many comments seemed intended to provide clarifying information or to express personal opinions. Lengthy stories tended to be written on the back cover of the questionnaires, while elaborations and opinions tended to be written inside.

Comments written by respondents were copied from the questionnaires into word files. Associated data related to personal characteristics of the respondent (male/female, age, educational experience, seasonal or permanent resident, town of residence) were also included to facilitate comparisons. Initial analysis of the text files (by two researchers using iterative processes) revealed that a notable feature of the entire corpus of written comments was that respondents made assertive presentations of opinions and

viewpoints about meaningful aspects of place in discussing their community and its environment. Thus, rhetorical analysis – the study of persuasive communication – was used to study the ways that respondents used language to argue their relations to place and the meanings of place. Following approaches suggested by other researchers (Gill and Whedbee 1997; Condit and Bates 2009; Feldman and Almquist 2012), the rhetorical analysis was guided by three primary questions: How does context help shape and influence the written comments? What rhetorical features are observable in the texts? What features of the texts are significant?

Rhetorical analysis proceeds by asking questions of data and by marshaling evidence to support generalizations about how communicative behavior is used by respondents to accomplish social goals. In studying *rhetorical context*, we asked about how sense of place was exhibited in the texts, which audiences might be inferred by authors, and how authors established credibility. In studying characteristics of the *text*, we analyzed the ways that community and place were described, the ways that stories were used to explain local ways of life, and the different kinds of logic used to express and support ties to place. To assess the significance of texts, we evaluated forms of argumentation used by writers, and considered how specific features of the text (such as metaphors and imagery) were used strategically to justify particular perspectives about place.

The rhetorical analysis revealed patterns and consistencies in the forms, styles, and claims of the written communications about place. In terms of form, written comments were structured primarily as either small stories or informational claims; the stories were notably historical in nature, though they were not always linguistically complete. In terms of style, rhetors used a variety of iconic and ordinary images to describe their communities and environment, and to comment on the qualities of others living there seasonally or permanently. In terms of rhetorical claims, respondents used five primary techniques to argue their relations to and senses of place: claims based on nostalgic appreciation, generational ties, place comparisons, personal emotion, and beliefs about how society should work.

In its attention to discursive and linguistic aspects of interpersonal communication, the study of persuasive communication has utility for sense of place research. We are currently comparing the findings from this study across towns, personal characteristics, and residential status in an effort to develop hypotheses for future research. The results presented in this study show how persuasive messages exhibiting meanings about place share particular forms, styles, and rhetorical claims. This research can aid in tourism monitoring and impact management programs by identifying important aspects of sense of place beyond content-based

analytic approaches. The results will also help community leaders and destination planners to develop communicative opportunities that foster authentic experiences of place, while enhancing sense of place for residents and visitors.

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# The influence of norms on catch & release behavior in salmon angling

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## Introduction

The live release of salmon (a.k.a. catch & release (C&R)) has been proposed as a tool to continue fishing for salmon while ensuring enough spawners in the river. In Norway angling has for a long time had taking fish for food as an end point. Semi-subsistence attitudes such that “you do not play with the food” (cf. catch & release) have been dominating. The growth of C&R is changing both the character of the fishery, abundance of fish and behavior of anglers. The literature on C&R is extensive and multidisciplinary, but many aspects of C&R are not well understood. Norms are known to influence human behavior, but their impact on catch and release angling has not been investigated yet as we are aware of. This study addresses the influence of norms on salmon anglers’ behavioral intention to voluntarily release fish.

## Theory

### Norms

Norms are defined as evaluative standards of individual behavior or conditions in a given context (Donnelly et al. 2000), or how Homan puts it (1950:124): “norms are not behavior itself, but rather what people think behavior ought to be.” Norms can help understand why people (individuals or collectively) express in regular or irregular behavior. The variables that activate (Bratt 1999; Schwartz 1977) a norm are the interest of some researchers. Others concentrate on how social pressure can impact behavior (Fishbein & Ajzen 2010). To find out what theoretical approach is the best for examining a problem, one should know how different researchers use the concept “norms”. Issues involving encouragement of environmentally responsible behavior (e.g. recycling, C&R), are probably best examined with the norm focus/activation models. The norm activation theories measure norms at the individual level (i.e. personal norms) and then aggregate the data to get social norms. The Theory of Reasoned Action (Fishbein & Ajzen 2010), however emphasizes the perceived social norms (i.e. subjective norms) and only indirectly address the concept of a personal norm (through a person’s attitude).

### Conceptual model

We have adapted and refined Bratt’s (1999) model of recycling behavior as a conceptual model for our study (figure 1). Bratt (1999) mixes the concept of Fishbein & Ajzen’s (2010) theory of reasoned action and Schwartz’s (1977) norm-activation theory. For Fishbein & Ajzen (2010) *social norms* are what the person thinks other people (e.g. family, fishing buddies, other anglers) think is the appropriate behavior; i.e. a subjective social norm. Thereby being institutionalized and often involves punishment or sanctions for

noncompliance. Schwarz’s (1977) norm-activation theory defines a norm as “an internalized sense of obligation to behave in given manner in a particular situation” (i.e. a *personal norm* (e.g. I should release or keep all the fish I can)). Two conditions are necessary to activate the norm and make individuals act: individuals must hold an *awareness of the consequences* their behavior has on others (e.g. deterioration of fishery if C&R is not done) and they must accept some responsibility for their actions (i.e. *ascription of responsibility* (AR)). Similar to Bratt’s (1999) study, we use a modification of Schwartz’ (1977) model and does not include AR.

## Method

A web-based questionnaire was sent to all anglers registered with e-mail by Lakselv Riverowner organization. Most scale variables were measured on a 7-point scale. Based on the variables in the conceptual model we ran a multiple regression model with behavioral intentions to release fish as the dependent variable.

## Results

We received 656 responses, a rate of 68%. The regression model explained 38% of the variation. Variables that significantly contributed positive to the intention to release fish were influence of fishing buddies, the four assumed consequences variables (except “self keeping every fish” which not significant), and the personal norm “favor C&R”. The personal norm “against C&R” was having a significant and negative impact on the DV. The influence of family members and other anglers in the Lakselv River did not contribute to the model.

## Discussion & conclusion

The reasons why a social norm was experienced only through fishing buddies could be that this group is closer to the angler and involve more in angling than other groups. The results indicate that anglers in this study responded to the assumed consequences of the collective action (the norm was activated and action taken) by adjusting their own behavior to avoid negative impact on the fishery. This implies that anglers tend to adjust their behavior in the way that they think most anglers should behave, even though the consequences of own behavior on stocks are relatively small. Knowledge or belief that released fish will survive was found to be variables that would activate the personal norm regarding keeping or releasing fish and again influence behavior. Implications of the results includes that managers, if they want to promote C&R, should try to shape behavior through informing and teaching anglers about proper handling techniques and the effects of C&R on individual fish and fish stocks.



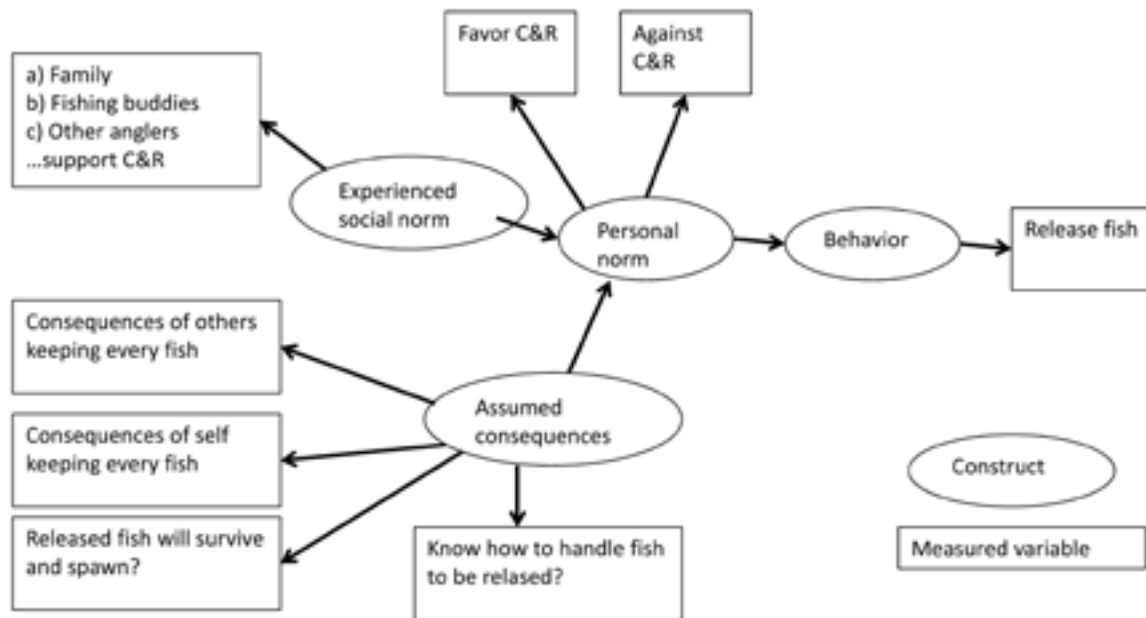


Figure 1. Conceptual model of the influence of norms on catch and release angling behavior. A merger of Schwartz' (1977) norm activation theory, and the theory of reasoned action (perceived social norm) (Ajzen & Fishbein & Ajzen 2010). Figure adapted from Bratt (1999).

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# Context matters in behavioural recreation research

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By now behavioural research on outdoor recreation is a mature field of investigation. A number of theories and concepts have been developed; some have been adapted from social psychology in general, some emerged as novel ideas within recreation. Usually such a concept is applicable to many outdoor recreation activities, and over time a solid basis of knowledge has accumulated about satisfaction, crowding, motivation, specialization and similar other theories. On some topics, meta-analyses have been conducted to consolidate findings from the many case studies.

It is somewhat perplexing that although our field of investigation is largely based on case studies, so far rather little attention has been paid to the context of these case studies. The vast majority of these studies apply the same theory on various scales or to various time frames without further scrutiny. Survey questions may require the respondent to focus on an entire year or a single visit, or the investigation may cover large management regions, or a very localized

area specializing in one or two very specific activities. Only few studies have explicitly compared this issue of context in space or time. The few studies which have focused on this context explicitly have observed – sometimes remarkable – differences.

My presentation will summarize past research and present the findings of several recent studies we have conducted in this regard, most with a focus on recreational fishing. Understanding context specificity is especially important if theory driven knowledge is to be transferred to other locations, or when it is to be used in integrated modeling such as socio-ecological models or agent based models.



# Methods for forecasting recreational use of natural environment

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## Introduction

Almost 70% of Finns live in urbanised areas nowadays. Compared to previous decades, the population is ageing, and income levels, the status of education and the amount of leisure time are increasing. The supply of recreation opportunities is very much an issue related to natural resources policy. In Finland, easy access to nature is guaranteed through everyman's right as well as the provision of green areas: 50 per cent of Finns live within 200 m of the forest. The foresight of recreation demand is essential for providing a vision to decision-makers in terms of how patterns of recreation behaviour may change, reflecting changes in demography, socio-economic structure, and the environment such as climate change. There is an increasing need for monitoring changes in recreational behaviour and tracking recreation trends. Therefore, forecasting information used for management and the planning of recreation resources is essential for seeing the overall picture of outdoor recreation in the future. This presentation will introduce different methods for forecasting demand for outdoor recreation and nature-based tourism.

## Methods

These methods include extrapolation of past trends in outdoor recreation, regression methods using cross-sectional data, and panel-data estimation techniques. The qualitative scenario work and Delphi application creates the framework for discussion. This study applies data from Finnish outdoor recreation demand inventories (LVVI) from 1999-2000 and 2009-2010 (Metla), outdoor recreation studies in 1970s and 1980s, and panel data from visits to national parks and hiking areas in 2000-2008 (Metsähallitus). Population projections and scenarios for environmental change, such as climate change, are compiled from various sources, such as the Finnish Environment Institute and Statistics Finland.

## Results

### *Using cross-sectional data to explain and predict participation in different outdoor activities*

**Regression methods:** Participation in outdoor activities can be measured using two types of measures: first, with a dichotomous variable that expresses whether an individual participates or not, and second, with a count variable that expresses the number of occasions or days of participating in a particular activity (Fig.1). Statistical models applied here that predict participation and the frequency of participation are the binary logistic regression and the negative binomial regression (Cameron and Trivedi 1998).

We have tested a set of socio-economic factors that we

expect to have an influence on participation and participation frequencies in our models. These factors are respondents' gender, age, educational level, household income, socio-economic status, employed (yes/no), size of municipality of residence, environment of residence (rural/urban) or region (Southern/Northern Finland), and access to a recreational home.

These models explaining the behaviour are extrapolated beyond the present by including population or climate scenarios. Changes in demography and in socio-economic variables are rather moderate in Finland. This reflects minor changes in the participation in outdoor activities. Changes in resources and conditions, such as the amount of snow for skiing (e.g. Pouta et al. 2009), seem to have a much higher impact on behaviour. This approach is criticised for making a strong assumption of the stability of behaviour patterns.

**Time series analysis:** We have information on participation in some traditional outdoor activities over a period of 30 years. These four national-level surveys or equivalent form time series of outdoor recreation trends in Finland. Our participation trends are partly fragmentary and short. This suggests the use of very robust methods for forecasting including naïve1 (no-change), naïve2 (constant growth rate with corresponding previous period), and exponential smoothing, which is an analysis tool that gives more weight to recent observations and less to past observations.

### *Using on-site data to model outdoor recreation demand*

Demand for recreation can be measured in terms of visits, days, trips, or facilities consumed. Recent research by Nerg et al. (2012) combines regional-level socio-demographic and economic data of demand factors to examine the consumption of outdoor recreation trips and the recreational resources and facilities available in order to determine visits to nature parks and hiking areas. Panel data estimation techniques were applied to visitor monitoring data from 46 national parks and hiking areas in Finland collected between 2000 and 2008. The results indicate that park size, number of services and number of inhabitants in the demand region increased the number of visits. Neuvonen and al. (2009) found that location near the population centers in Southern Finland, developed services in terms of trails and possibilities for outdoor activities explained the higher number of visits.

The travel cost model is often applied to estimate recreation demand. As a revealed preference method, the travel cost method relies on actual choices that people have made. The travel cost method (TCM) involves estimating a recreation demand function based on the number of trips taken as the quantity variable and the travel cost as the price vari-

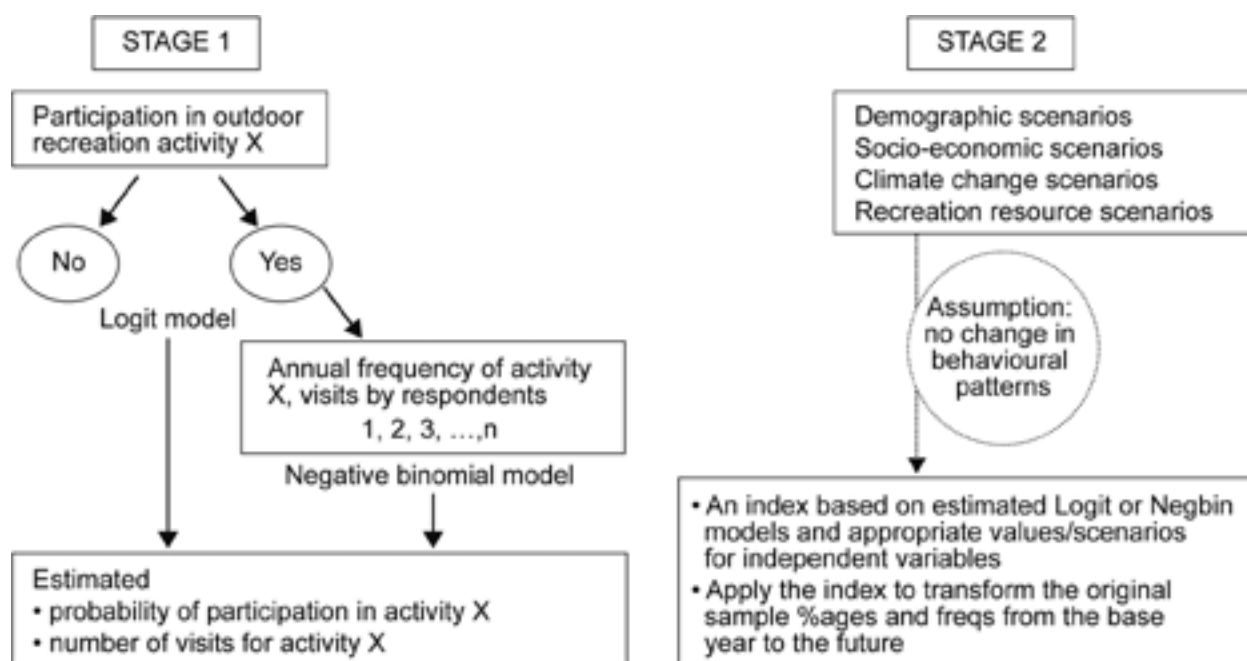


Figure 1. Stages of modeling and predicting outdoor recreation participation with cross-sectional data.

able. Ovaskainen et al. (2012) stated that the cost of travel time was related to visitor and trip characteristics and had an effect on benefit estimates.

#### Other methods

**Delphi method:** An expert panel was consulted to construct the future of nature-based tourism in Finland, including both domestic and foreign visitors (Koivula and Saastamoinen 2005, 44–46). The panel of 32 experts contributed to the research to create the scenarios for 42 different activities. An estimate for procentual change by the year 2014 was compared to situation in 2004. The assessment indicated increase (on average 20–25%) in most of the activities. Compared to the results of recent LVVI-study, the small increase in domestic participation rates can be empirically

supported. On the other hand, a recent national survey shows that traditional activities like berry picking were increasing and fishing was experiencing a slight decrease, contrary to expert expectations.

**Scenario method:** A qualitative foresight method uses expert assessment of megatrends and scenarios of other sectors in society, including trends related to the environment, business, livelihoods, and people's values and attitudes indicating different ways of living, which can all be merged into scenarios of future recreational behaviour and its implications for recreation resources management, but also future prospects for nature tourism.

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# The ‘Alpenplan’ as spatial planning tool: a critical appraisal

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## Introduction

The Alps as a natural area are of major importance providing ecosystem services and habitat functions as well as traditional cultural landscapes. The latter have been regarded as attractive tourism destinations for several generations. Due to the public good character of landscapes, conflicting interests lead to the need for government intervention in the form of spatial planning and conservation measures. This holds especially true for the German Alps situated as a small strip of 20 km width and 240 km length in the southernmost part of the federal state of Bavaria. They are the object of contradictory land use preferences of different stakeholders like the adherents of nature-based respectively infrastructure-based tourism forms situated in the peri-alpine agglomerations like Munich. Thus, the Bavarian Alps serve as a typical example for the alpine-wide problems of continuing development pressure. These are caused either by the highly competitive tourism industry or by the demand for renewable energy production (hydropower) against the background of rising natural hazard risks in the wake of climate change (Mayer, Kraus, Job, 2011).

In order to manage the differing land use demands the Bavarian State government implemented the decree ‘Alpenplan’ (AP) in 1972. 40 years after the implementation this paper aims at a comprehensive evaluation of the AP’s effectiveness as a planning tool in terms of limiting further tourism and infrastructure development in sensible alpine environments.

## Emergence, intention and implementation of the ‘Alpenplan’

After 1960 the Bavarian Alps emerged as the most important domestic tourism destination in Germany. Especially the so-called “ski-boom” led to quickly rising numbers of ski areas, cable-cars and ski-lifts in the Bavarian Alps. Since the Mid-1960s environmentalists and the lobby groups of hikers and climbers like the German Alpine Club started heavily criticising this winter sports boom as an uncontrolled development. In their perspective, it seemed that the interests of nature-based tourists were completely overrun by ski area developers and that even the most exposed and ecologically sensible parts of the mountains were endangered (Karl, 1968).

After a public hearing procedure was undertaken in 1970/71 the implementation of the AP as a decree took place in 1972 already (Goppel, 2003). The targets of the AP were implemented by a central mechanism, the zoning of the entire Bavarian Alps (4393.3 km<sup>2</sup>, excluding lakes) according to pre-existing land-uses, environmental sensitivity and a suitable future development. Thus the Bavarian Alps were divided into three zones by institutional regulation (see figure 1). Each zone represents an area for several main functions (Barker, 1982):

- Zone A (35.24% of the Bavarian Alps) includes all settlements and most areas with substantial pre-existing land uses, for example valley floors and tourist resorts and is earmarked „generally suitable“ (except airports) for further infrastructure development (e.g. ski lifts). Zone A provides an area for ski tourism and other mass-market forms of recreational land uses.
- Zone B (22.23%) serves as a buffer zone in which projects are permitted only if they do not conflict with more stringent regional planning requirements. Infrastructure projects require an individual review of potential impacts and are mostly allowed if necessary for forestry and mountain agriculture.
- Zone C (42.53%) is designated as a strictly protected zone in which all activities except traditional agriculture and non-intensive, “adjusted” nature-based recreational activities such as hiking and ski touring are unacceptable. Zone C is generally not suitable for any infrastructural development; the only exceptions are measures for the management of traditional cultural landscapes like forest tracks and dirt roads to reach alpine pastures – these exceptions were necessary to overcome the resistance of the primary sector and water management agencies against the AP. Zone C is covering mostly upper mountain ranges, protected areas and nearly all high ridges along the southern border to Austria as well as the areas with high erosion and avalanche risks.

## Discussion and conclusion

The AP is a spatial planning instrument with certainty as well as high consistency. From a conservation point of view the effectiveness of the AP is evaluated positively because most of the projected cable-cars of the early 1970s have not been realised. Since 1972 no exceptional development projects have been permitted in the zone C.

Comparing the designation of protected areas in the Bavarian Alps over time with the extensiveness of zone C it is remarkable, that the AP is undeniable fostering preservation strategies of the sectoral planning body for nature conservation. If we look at zone C, it shows major overlapping with protected areas. Moreover, AP’s core zone stretches out far beyond, resulting in an extra share of more than 20% specifically strong protection measures. This clearly highlights the importance of zone C in ensuring an effective protection against any infrastructural development in ecological sensitive areas of the Bavarian Alps.

Concerning the limitations of the AP, it must be made very clear that the AP aims at regulating first and foremost ski tourism, which is mass tourism per se. The AP does neither prevent the intensification of ski tourism nor qualitative infrastructure development in zones A and B (e.g., higher transport capacities of modernized cable-cars, instal-

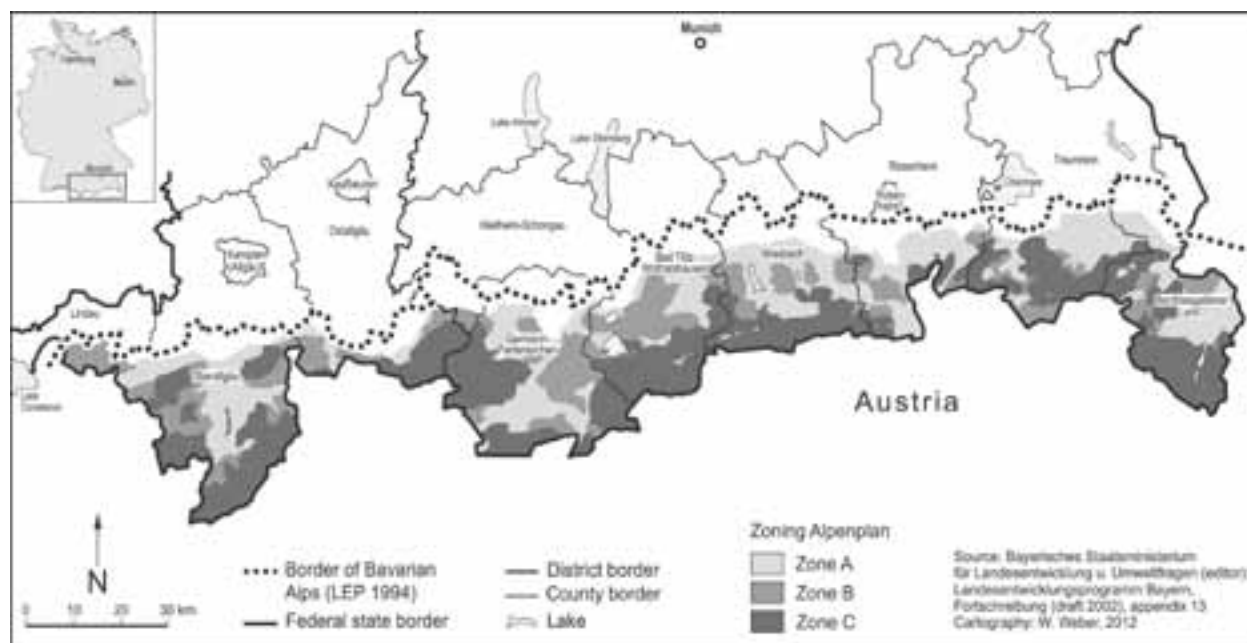


Figure 1. The Bavarian Alps and the zones of the 'Alpenplan'

lation of snowmaking facilities, or floodlighted ski runs). Furthermore, this planning instrument is not able to implement a visitor management for ski-touring or snowshoe hiking. Being both winter tourism market segments with continuously rising numbers during the last decennia, these nature-based tourists mostly do not care much about infrastructure but search for solitude and first traces, resulting in minor possibilities for their spatial concentration. If we want to protect one of the last German habitats of black grouse (*Tetrao tetrix*) as pristine hideaways, the AP is definitely overstrained. Additionally, the AP is not a suitable instrument to regulate the mountain biking activities in the Alps also gaining popularity in the last decades. In contrast to ski tourism, the AP explicitly allows new dirt roads to be built for forestry and alpine pasture use even in zone C which are frequently used by mountain bikers.

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# Outdoor recreation – an important public interest that current municipal spatial planning in Sweden cannot protect?

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## Outdoor recreation – an important public interest

Many people rate outdoor recreation opportunities very high – many so high that it affects their choice of city or city district to live. A national Swedish questionnaire-based opinion poll, *Friluftsliv 07*, and a supplement survey of *Blekinge archipelago and coastal zone* in the south east corner of Sweden, show that the general public express high expectations of the opportunities to enjoy outdoor recreation close to where they live (Fredman et al., 2008a). In many policies from national authorities it is also expressed that outdoor recreation is very important for public health, environmental concern, and as nature tourism also from a local and regional economic perspective. It is also stressed by public authorities at the national level that municipal spatial planning ought to be able to function as a tool to protect outdoor recreation in land use issues (see for instance Swedish Environmental Protection Agency (2005)). However, to what extent the municipal spatial planning can protect outdoor recreation is unclear. This issue has been investigated in the research project “Spatial planning for outdoor recreation” as a part of the national research programme “Outdoor recreation in change” (Petersson Forsberg, 2012).

## Strong protection for outdoor recreation at first glance – but actually weak

At first glance it might seem that outdoor recreation enjoys strong protection in the planning legislation. Outdoor recreation is considered in the *Planning and Building Act* as a matter of public interest, and is included in the *Environmental Code* as a matter of national interest and as one of the two stated reasons for shoreline protection. However, several public interests along with private interests should be considered in planning and the planning laws are in the nature of framework laws. Thus the legislation is open to interpretation on a number of issues. This means that the outcome of planning decisions is far from a foregone conclusion and each actor with any influence in the matter can leave their mark on the end result. The ambiguity of the term *public interest* is another complicating factor in outdoor recreation planning. Furthermore a large number of national regulations important for the municipal spatial planning for outdoor recreation have been recently changed, for instance the shoreline protection legislation and the new *Planning and Building Act*. Many people fear that these recent changes entail a stronger emphasis on private interests, and of that an increased number of planning decisions will accept exploitation and building on public green areas. But it is still too early to tell the outcomes of those changes (Petersson Forsberg, 2012).

Many Swedish population centres have sufficient amounts and quality of green areas accessible to the public. But there are also many cities that have insufficient public green space close to where people live (Central Bureau of Statistics, 2010). According to municipal planning officials that were interviewed in 2010/2011 it is often stated by politicians and planning officials that “well, there’s lots of green places around”. This mean that they think it is possible and appropriate for outdoor recreation to move somewhere else for the benefit of exploitation. The rather extended *Right of public access* in Sweden might be a foundation for this argument. Also the current planning doctrine of “compact cities”, which often is marketed with the arguments of sustainability, puts urban green areas under pressure for exploitation. To a high extent (70 %) people expect municipalities and the state to protect recreational areas, but their knowledge of public participation in the municipal planning process is limited. Almost 40 % answer “don’t know” to this question (Fredman et al, 2008b). This could mean; i) municipalities have a poor planning concerning outdoor recreation, ii) municipalities have a poor communication with the citizens concerning planning for outdoor recreation, iii) people do not care about planning for outdoor recreation as long as they are fairly content with the outcomes of the planning decisions (Petersson Forsberg, 2012:167). As discussed above there are several factors that might lead to increased lack of green space in urban areas and the planning legislation cannot be expected to protect outdoor recreation more than any other interest. So what can be done?

## Possible interventions

Changes in the wordings of the planning legislation might be the first issue that comes to mind in order to enhance the status of outdoor recreation in planning decisions. But some aspects tell against that. For instance the fact that current planning legislation bears signs of compromises between political stances as a battle between public and private interests, of which the wordings bear witness. There are also signs in society as a whole that the status of private interests is getting higher. For instance the private interest is enhanced in a revision of the Swedish constitution and in the law of the European Union. Probably, changed wordings in the legislation would show the same signs. Education can improve the understanding of the values of outdoor recreation and thereby, at least to some extent, enhance its status. But education might not solve the issue completely because many “wrong decisions” do not emanate from ignorance but from different value assessment (Emmelin et al, 2010). Education, however, might lead to a more objective notion



on the sustainability of compact cities, where the balance between compactness and liveability is discussed and also to an improved knowledge of the climate change and its consequences for outdoor recreation. However, as many people do care about their recreation opportunities, the most effective way of enhancing the status of outdoor recreation in planning decisions might be to increasingly engage people in the municipal spatial planning process. This could mean a planning process that is more transparent and more easily accessible to the public.

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# Privacy concerns and common access along the Norwegian shoreline: tensions and possibilities

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In a qualitative part of a case-study at Saltnes, south-eastern Norway, we have explored how different groups in their recreational practices cope with two conflicting interests along a populated and developed shoreline; the right to privacy for the house- or cabin-owners and the public right of access (see also Skår et al. 2011; Wold et al. 2012; Skår and Vistad in prep.). The area of study has a rather developed shoreline, consisting of a mixture of cottages and permanent residences. A few years ago, some fences and other hindrances were removed by the municipality of Råde in order to improve public access, in compliance with national legislation and political goals. This study indicates that it is not sufficient to provide physical and juridical access, because social, psychological and cultural mechanisms remain strong barriers for use of the shoreline. People's general respect for privacy, and the need for the house-owners to protect their privacy, form strong attitudes affecting behaviour and the perceived accessibility of the shoreline.

The study is based on a qualitative fieldwork implemented as 'walking interviews' along the shoreline. This method provides specific and in-depth knowledge on experiences and attitudes. 22 locals, 16 cottage owners and five camping guests reflected on their concrete meetings and perceptions of the private-public divide in research conversations on site.

The study is inspired by the analytical perspective of cultural models from the field of cognitive anthropology (Quinn & Holland, 1987; D'Andrade & Strauss, 1992), and in accordance with Roy D'Andrade's view on cultural models as a cognitive schema which is shared inter subjective within a group of people. Cultural models deal much about our relationship to 'The Other', what kind of behavior we think is expected by others and how we think that others should behave. Such expectations are based on 'consultation' of cultural models. Thompson (2007) maintains that exercise of private right of ownership with low or no conflict is only possible with sufficient degree of shared expectations to behavior among different users. If the cultural models are either insufficient, or not shared between the actors or seem opposed to each other; conflicts will arise. According to Thompson (2007), all these challenges are present in the coastal zone, and in a higher degree than elsewhere.

Protection of privacy and the public right of access can be seen as two extremes of different cultural models. The analysis of cultural models in this study shows that users of the shoreline (both visitors and dwellers) in their recreational practices often are positioned somewhere between the two extremes (see Figure 1). By focusing on this intermediate position, we point out some areas of action that might improve the conflict situation.

**Communication** contributes to clarify each other's attitudes. Several of the property owners claim that if the visitor appears friendly, polite and preferably ask for permission to take a bath, they have a lower threshold for accepting public traffic on their properties, compared to visitors that appear importunate, annoying, impolite etc. The interviews even illustrate how politeness and friendliness from the house owners are important for the visitors' satisfaction with their own walk or stay. A small gesture or 'hello' from the present property owner will help clarifying a situation that otherwise is experienced as uncomfortable both for the property owner and the visitor. Thus strategies for improving communication in shore line regulations, planning and management is a field that should be explored further.

**Physical markers separating private zones from public areas.** Despite some negative views on dominating physical markers in the terrain, smaller markers of the public-private divides such as fences, low hedges, boulder walls, tracks, gravelling and signposts seem important to ensure both public access and the right to privacy. Appropriate passages down to and along the sea seems important to make public access possible by canalizing it past private properties. Reusch (2012) claims that paths and shortcuts have a weak juridical protection in Norway compared with several other countries. The reason, she points out, is that small paths are not intercepted in municipal area planning. She recommends municipalities to highlight small paths in the planning phase, combined with specific demands to the developer. But most important, all small paths and short cuts should be included in electronic maps. In accordance with Reusch (2012), the interviews at Saltnes expose a concern about downscaling and shortening of walking paths down to and along the sea, and several informants ask who is actually responsible for maintaining such paths.

**Diffuse regulations.** Both house owners and visitors ask for clearer rules, clarifying where people are allowed to walk or stay (Skår and Vistad in prep.). The public right of access allows anyone to walk on private property in the Norwegian shoreline, as long as the property is categorized as 'outfield' and consideration and due care is taken. This study indicates that the public right of access does not secure public access to developed nature areas like populated shorelines. An important challenge is connected to the fact that respect for privacy counteracts the recreational practice and the public right of access. Reusch (2012) asks whether populated parts of the coastal zone no longer should be defined as outfields, and that regulation of public traffic on private properties along the shoreline, as well as other populated areas, is needed. This means less emphasizes on the outfield-infield categories than in prevailing regulations. It even means to take those discussions into account that con-

PRIVACY	← →	COMMON ACCESS
<b>Cabin owners an permanent residents with shoreline properties</b>		
Avoid other shoreline private properties		Tolerate traffic on own property
Avoid other private properties when landowner is present		Allow bathing on own property
Find alternative places to walk, such as the coastal track		Greet passing people
Deny people settling by addressing them or by other signals		Accept and follow physical markers directing traffic past the properties
Place furniture or other private stuff on the shoreline		
Build or maintain physical barriers		
Reprimand people using private docks		
<b>Cabin owners an permanent residents without shoreline properties</b>		
Avoid shoreline private properties		Walk close to houses, because it is "legal"
Avoid private properties during summer		Argue strongly, when asked to move elsewhere
Avoid shoreline private properties when landowners are present		Use private docks
Walk as far as possible from houses		Provoke by gathering lots of people on private beaches and make noise.
Be polite and greet people		Leave garbage
Look down and pass quietly		
Walk where signs indicate it is allowed		
Find alternative places to walk, such as the coastal track		
<b>Camping guest</b>		
Be considerate about neighboring properties and stay on the camping site		Bathe from neighboring docks
Avoid other shoreline private properties		Argue strongly, when disturbances are commented
Walk on tracks where signs indicate it is allowed, such as the coastal track		Tolerate that other people use the camping beach
Walk as far as possible from houses		

Figure 1. Cultural models of 'Right to privacy' and 'Public right of access'.

cerns transgression of 'the right to privacy'.

Studying different cultural models in the shoreline, based on practical experiences of the users, offers the possibility to focus on changes of accustomed mental patterns and

motivations for action. We have pointed out some actions that should contribute to reduce the conflict level in the shoreline.

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# Protected area governance conflicts in Ireland – mending poor relations and new modes of governance

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Protected area governance concerns the interactions among structures, processes and traditions that determine how power is exercised, how decisions are taken and how citizens or stakeholders have their say (Graham et al., 2003). Over the last few decades, protected area governance has moved away from being a predominantly state-based ‘top-down’ model to a multi-level system under which powers and responsibilities are diffused among a diversity of national and local government actors, civil society organisations and local communities management (Lockwood, 2010). Although the 1990s saw the emergence and increasing emphasis on the role of partnerships and collaboration as important elements in resolving environmental problems and achieving sustainable tourism development, many of Ireland’s protected areas became embroiled in belligerent planning and governance conflicts (Healy & McDonagh, 2009).

Drawing on a case study of the Burren region in the West of Ireland this paper firstly identifies socio-cultural, historical and political factors which contribute to, complement and accelerate the contentious and conflictual nature of Irish protected area governance. Secondly, it presents the key factors which enabled BurrenLIFE (an EU Life-Nature Funded project) become one of the first successful projects to mend poor relations in a land-use conflict. Finally, drawing on the good governance practices of BurrenLIFE this paper proposes a new governance model which could be developed for future and existing attempts at sustainable tourism in the Burren and elsewhere.

## Methodology

A multi-method research approach that included in-depth key actor interviews (n=57), short informal interviews (n=117) and visitor survey’s (n=114) was adopted. This reflected a desire to capture the voices of local people affected by international tourism and protected areas, along with the multiple layered realities and ‘messy texts’ of ‘lay and expert’ knowledges and experiences in protected area governance. This enabled an extensive investigation of the connections between Irish politics and planning at local and national levels; the relationship between diverse knowledges within communities and the associated power structures and civil society’s involvement in responsibility, authority and decision-making in protected areas.

## Ireland’s complex protected area governance system

The paper argues that Ireland’s disjointed style of governance and complex socio-cultural, historical and political factors nurtures unsustainable development, tourism, and land use, as well as protected area conflicts. The presence of a mixture of all four of Graham et al.’s (2003) governance types (see table 1); a weak protected area system; its colonial legacy and a strong attachment to land; high private pro-

perty ownership rates and an ensuing antipathy to external regulation – all contribute to the complicated and conflictual nature of tourism governance in the region. Centralized government and policy-making structures prevent more inclusive forms of governance while the local nature of clientelistic politics in Ireland is identified as conducive to corrupt and unsustainable planning decisions (Healy et al., forthcoming). Discussions of protected area planning tend to disregard, neglect, or underestimate the social relations of power and politics that form Ireland’s approach to protected area tourism development.

## Mending relationships and good governance in the Burren

Despite the indications that the Burren region is not presently engaged in a collaborative approach towards tourism planning, this research provides evidence that positive action is occurring. BurrenLIFE is one of the first projects to have been successful in mending poor relationships between farmers, local communities and governing bodies in the region. It exemplifies a number of key factors which enable it to function successfully and to mend poor relations in a land-use conflict, such as active participation from grass-roots to the highest level; local ownership of projects; treating all stakeholders as equal; a strong project leader who gained trust from all sides; and continuity of funding.

## A Burren agency – a new co-management model of governance

This research stresses the need to introduce a linked network of management in the Burren in the form of a new umbrella central governing agency which would govern all activities in the region. A Burren agency could formulate a Burren specific management model using successful elements incorporated by the BurrenLIFE project. The complete decentralization of environmental decision making may privilege parochial concerns over strategic goals and thus requires ‘expert’ input alongside lay knowledge. Therefore future protected area partnerships should move towards models of governance which incorporate a co-management model with legitimate participation, with power given to grass-roots dialogue, which facilitates a balance between local and central government in resource management. Moreover, these new modes of governance must explicitly recognise and engage with Ireland’s deep cultural, social, economic and historical complexities. In order for collaborative process and structures to work, the varying financial statuses, political propensities, cultural specificities and histories of place, region and country need to be integrated. Protected area governance and design of collaborative structures requires a ‘specificity’ which must be appropriate to the social, legal and political systems at both national and local levels.

Table 1. Examples of the multiplicity of governance types in the Burren

		Protected areas	Visitor centres	Archaeological sites
<b>A. Government management</b>	National	Burren National Park, e.g. Slieve Carron Nature Reserve SAC	Dramore Woods Nature Reserve	Cahercummaun Lemenagh Castle Poulnabrone
	Local	Cliffs of Moher i.e. SPA	Cliffs of Moher	Poulnabrone
<b>B. Multi-stakeholder management</b>		SAC	Kilfenora Burren Centre	
<b>C. Private management</b>	Individuals	SAC SPA NHA	Caherconnell Doolin cave Aillwee cave	Caherconnell Parknabinna Wedge Tomb Poulawack cairn
	Non-profit		Michael Cusack Centre	
<b>D. Traditional community management</b>		Commonage areas		

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# Balancing public access and privacy concerns along developed coastal zones: Stakeholders' preferences for management actions.

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## Background and theory

According to Statistics Norway most of the shoreline around south-eastern Norway is developed or otherwise difficult to access, due to private homes and cabins, roads, railways, other land use or developments, and abruptness. The majority of the Norwegian population lives quite near this coast, emphasizing the great need for improved public coastal access. The potential for such improvement is mainly connected to these “inaccessible coasts”. One of the challenges is that the actual rules and regulations concerning legal/illegal access and behavior in such developed areas are imprecise, implying constraints, uncertainty, and even stress, both among the potential visitors (the public) and the waterfront dwellers, and there is a great potential for conflict escalation in shoreline areas.

In Norway most of the coastal areas are private land. In 1957 an Outdoor recreation act was approved, formally legalizing the custom law concerning public access rights and with quite detailed description of rights and responsibilities, both for the visitors and for the landowners. The public access right applies on land defined as ‘outfield’ (*utmark*). Defining the boundary between ‘infield’ and ‘outfield’ is especially challenging along developed shorelines (see Skår & Vistad, this proceedings). Within the planning and building sector several acts (since 1965) have included prohibition and strict regulation of building activity in the 100 meter coastal zone. Still, there has been a continuous ongoing construction activity, primarily through exemptions from the general prohibition.

We are studying a situation where some actors (‘the public’) want and need access to the shoreline, while others are already situated along the shoreline and need to protect their right to privacy. Theoretically this can be regarded as a (potential) conflict between two groups due to contrasting goals or perspectives, competing over the same limited resource (Graefe and Thapa, 2004). Lazarus and Folkman (1984: 19) introduced a stress coping model that considers the individual’s subjective interpretation of a stress transaction. Schneider and Wilhelm Stanis (2007) and others have discussed, expanded and adapted the model, as part of a quite long development within leisure constraint research. Marcouiller et al. (2008) discuss the relation between different kinds of interaction types, on the scale from Complementary interaction, through Supplementary, to Competitive, and finally, Antagonistic interaction. They introduce what they call “*three generic categories of specific management or planning inputs*” (p. 7) in their model: interpretation, adaptive site planning, and recreational technologies.

Our research question is: Along developed Norwegian

shorelines and when there is a need to improve co-existence between public visitors and local waterfront dwellers: How do these stakeholder-groups judge different applicable management measures aimed at improving the co-existence? How realistic is the ambition to meet both the public and the private interests?

The study included a list of ten potential management actions that can deal with this balance of interests along developed shorelines. The ten listed actions covered different management tactics, like *Information signs*, *Physical facilitation*, *Physical boundaries*, *Prohibition*, *Removing privatizing objects* and *Designating public recreational areas*.

## Method

The study was implemented in Saltnes, Østfold County, among all the relevant groups of stakeholders (local inhabitants, cabin owners and regular campers, total N= 545) concerning coastal recreation, access needs and privacy needs along the actual private shoreline. The respondents belonging to the local inhabitants and cabin owners included both waterfront dwellers and those residing away from the shoreline. In the analysis we have identified these two groups/segments, based on where their home or cabin is located (waterfront dwellers and “the public”).

## Results and discussion

Management measures that tend to favor or ease public access to the shoreline (measure C, D, E, F and G in figure 1) are significantly more favored among the non-waterfront dwellers. The waterfront dwellers are significantly more in favor of measures that tend to protect their need for privacy (measure I and H) and more against *designation of private properties as public recreational areas* (measure J), compared to the non-waterfront dwellers. All this is quite as expected. Though, two measures are both quite highly favored, and importantly: both waterfront dwellers and non-waterfront dwellers (public visitors) rate them equally high: *Using information boards saying clearly what is legal and illegal* (measure A) and *Simple marking with color showing where you should walk along the shoreline* (measure B).

The “ideal” social situation in the developed and attractive coastal zones at stake is when both the public visitors and the waterfront dwellers co-exist in rather cooperative and harmonious ways, in addition to achieving their individual amenity goals in the particular coastal area. Marcoulier et al. (2008) highlight interpretive elements (providing information) and adaptive site planning as relevant tactics in reducing tensions and assist tolerance building. The two measures (A and B) might have the potential to play an

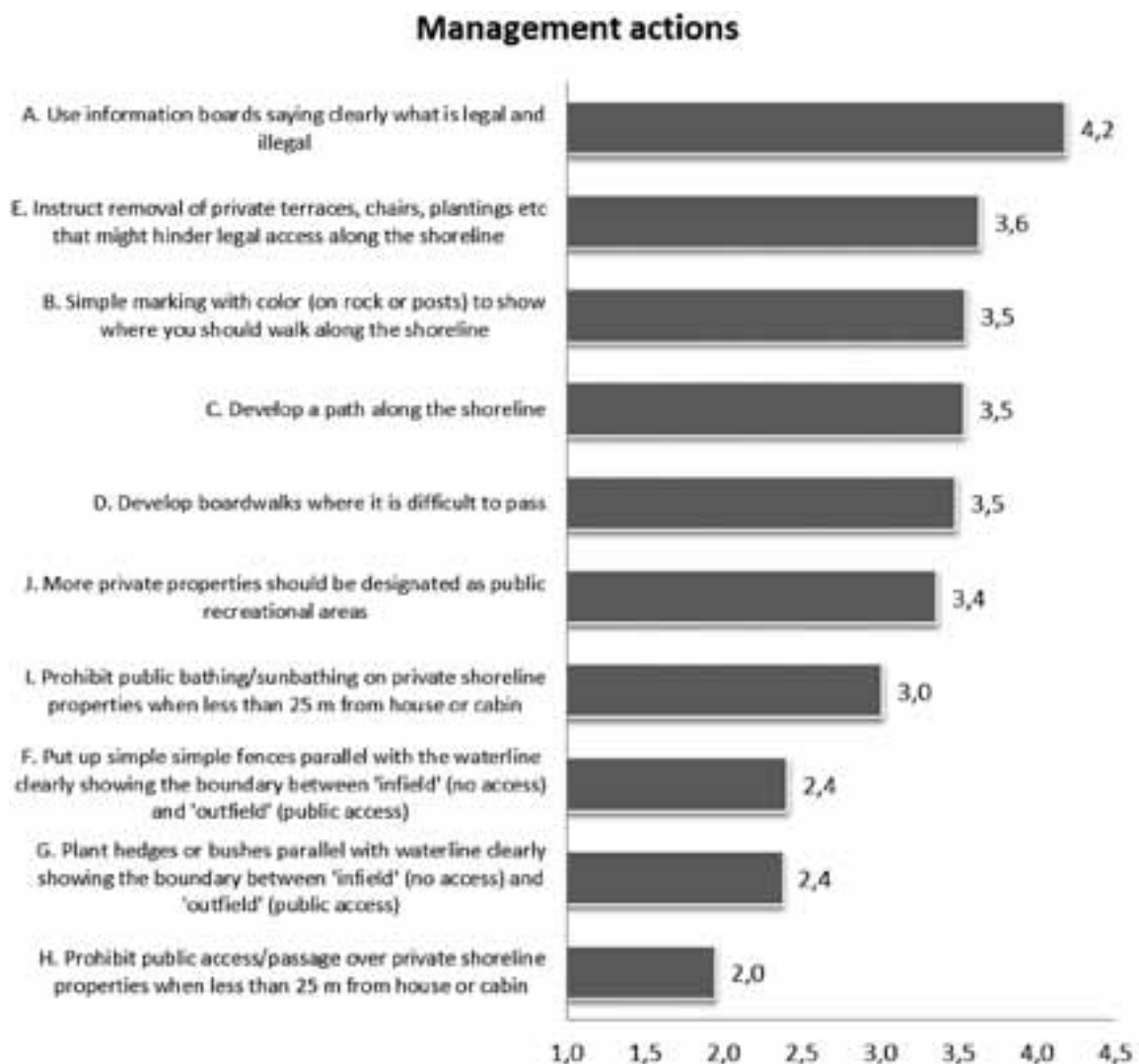


Figure 1. Average judgment scores of ten possible management measures concerning developed and populated shoreline areas with public recreational interests. Scale from 1 (very bad action) to 5 (very good action).

important role in improving the stakeholder co-existence along populated shorelines, provided a satisfying adaptation to local conditions.

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# Differences among hikers, runners and mountain bikers in a peri-urban park

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## Introduction

Conflict can occur when people engage in different recreational activities on the same trails within parks. But which activities create conflict, and why do some visitors have issues with some users but not others? Peri-urban parks provide a good model to investigate these issues. Such parks often have high visitation due to their proximity to rapidly growing urban areas, and the increasing demand for outdoor recreation that this growth generates (Arnberger and Brandenburg, 2007). Popular activities in such parks include: walking, bird watching, mountain biking, horse riding and running. These activities typically occur on multiple use trails, where conflict among visitors can arise, especially during periods of peak usage (Arnberger and Haider, 2005). Managers of multiple use trails often have to cope with multiple types of user conflict (Bury et al., 1983) that can diminish visitor satisfaction (Moore, 1994). While researchers in the United States have examined conflict on multiple use trails in various types of parks, limited research has occurred elsewhere, despite the growing popularity of outdoor recreation in many countries, including Australia. This study assesses park-user interactions within a peri-urban park in South East Queensland, the fastest growing metropolitan area in Australia.

## Study area

D'Aguilar National Park is close to Brisbane City, the capital of Queensland, and is a popular destination for a range of outdoor recreational activities. The Park was declared in 2009, and protects 36,000 ha of open eucalypt forest and rainforest. An extensive network of multiple use and single use walking trails in the southern section of the Park offers visitors a wide range of recreation opportunities. Common activities include mountain biking, hiking, horse riding, running and bird watching. Three high use locations within the southern section of the Park were selected to conduct visitor surveys.

## Methods

Information on visitor demographics, park usage patterns and visitor perceptions about other park users was collected using an on-site self-completed visitor questionnaire. The instrument included 24 questions (yes/no, likert scale and multi-option measures) to obtain information about demographics (gender, level of education and age), park usage patterns (activity, motivation, frequency and duration of visit, encounters with other users, group size and type, time and distance travelled to the park, and mode of transportation). Information about user perceptions of their own and other's activities and/or behaviours was also assessed. Participants were asked to identify how positively,

neutrally, or negatively a range of activities impacted upon them, and whether they perceived environmental or social impacts from these activities. The survey was conducted over six days during a peak period of visitation – the Easter holidays and a following long-weekend. Two interviewers approached all people arriving or leaving the Park at each of the three locations and asked them to complete a questionnaire. Once data were entered electronically and validated, descriptive statistics and chi-square analyses were performed.

## Results

A total of 288 visitors were surveyed resulting in a response rate of 78%. Visitors participated in 14 different activities: bushwalking (121 people), mountain bike riding (95), running (39), dog walking (6), horse riding (5), bird watching (4), nature encounter (4), and others (11) such as volunteering. More men (71%) than women (29%) used the Park with most visitors between 25 to 54 years old (86%). Most respondents (63%) were frequent users of the Park, visiting on a weekly basis (40%), or more than 5 times a year (23%); only 21% were visiting the Park for the first time. Nearly all respondents (85%) visited the Park on weekends. Motivations for the visit were: getting exercise (71%), engaging in recreational activities (41%), enjoying nature and outdoors (39%), and for adventure or challenge (40%). Nearly all respondents (92%) encountered other visitors. Most respondents (60%) were not affected by other users, their activities, or their behaviours. Of the 40% of respondents who were affected, 84% of these (98 people) were positively affected, with no significant differences based on gender or activity. The only activities consistently negatively affecting users were motorized activities (Figure 1), which are currently banned in the southern section of the Park. Nevertheless, 20% of respondents reported encountering trail bike riders and 2% of respondents encountered four wheel drive vehicles. All other activities were considered to be neutrally, positively or strongly positively affecting visitors' experience (Figure 1). Although some respondents reported neutral or positive perceptions of non-motorized activities, they nonetheless considered that these activities had some negative impacts, including: damaging plants or habitat, frightening wildlife, startling people, making too much noise, and potentially causing collisions.

## Discussion

Contrary to the findings of many other studies, there was very limited conflict among user groups in D'Aguilar National Park, even for activities that have been reported in other studies as a source of conflict, such as horse riding, dog walking and mountain biking (Figure 1). However,



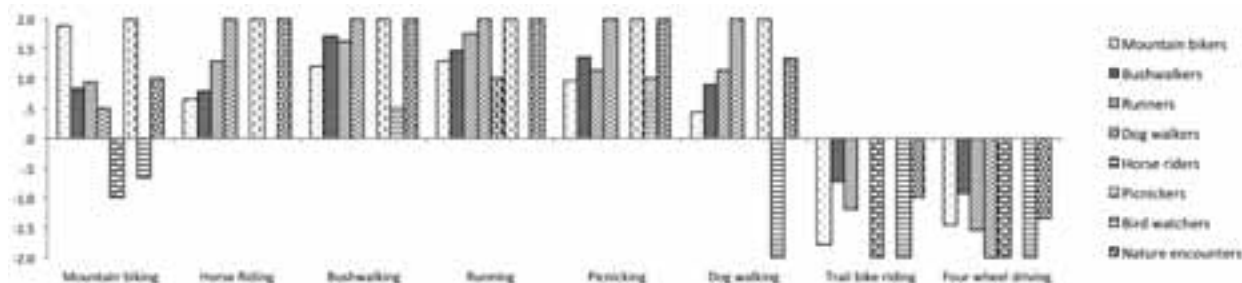


Figure 1. User groups perceptions about how positively or negatively the different activities impact upon them in D'Aguilar National Park, Australia (2 = strongly positive, 0 = neutral, -2 = strongly negative).

25% of respondents held negative attitudes towards motorised activities, corroborating prior research (Gordon, 2003, Horn, 1994). Previous encounters with other types of users had a significantly positive effect on interactions for a wide range of non-motorised activities, as has also been found in other parks (Gordon, 2003). Survey results highlight that user-interactions do not necessarily generate conflict. However, as the study was conducted on a wide trail in a high use peri-urban park, this does not mean that conflict may not occur on narrower trails with lower use in more remote locations, in this and other parks in the region. Also, the peri-urban setting, and sampling over a particularly popular time for visiting the Park, could have resulted in temporal or spatial displacement, rationalization, or product shift (Arnberger and Brandenburg, 2007).

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# Being in nature and the development of personal values

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Being in nature and being active in nature (which roughly means an area or a period of time where nature perception is dominant) offers other experiences than being or being active in a place where man-made things are the dominant focus of perception. The experiences offered in the natural environment seem to be an expression of the connection between nature and human being (as a part of nature) and can also refer to the aspect of a conscious experience of values (Liedtke 2005; Liedtke 2007). This, in turn, raises the question if experiences in nature reflect or even change the personal motivational values of young people?

## Project: 24 hours outdoors

We designed a project where school children between the ages of 11 and 13 years took part in an activity called “24 hours outdoors”. In this project the children had the chance to be concerned (active) with aspects of living in the outdoors (cooking, preparing shelter, sleeping outdoors), challenges, calming down, playing, cooperating and being creative. The project took place in two settings: (1) the city of Hamburg using parks, small green areas and the schoolyard, or (2) in a rural area approximately 60 kilometers south of the city center of Hamburg in a park-like area with a small lake. The children spent the night in simple shelters using their own sleeping bags or blankets. The project “24 hours outdoors” was arranged in cooperation with two schools. Study participants (i.e., school children) could choose to participate or not.

## Methods

Two school groups with a total number of 40 children took part in the project. The influence of the project on personal values was reported mainly by the 21-Item Portraits Value Questionnaire (Schmidt et al. 2007; Schwartz 2002) in a pre-post-design and through additional interviews and observation (Flick 1995).

## Results

The results of PVQ-survey showed significant changes in 7 of 21 items of the Portraits Value Questionnaire (see table 1).

The value orientations *power* and *self-direction* (in their specific item) became more important during the course of the project while achievement, security, tradition, benevolence and universalism became less important. Although some of the changes seem to be quite marginal the level of significance is very high.

## Discussion

Two aspects seem to be interesting to discuss: on the one hand significant changes in personal values were observed. On the other hand, what explains the increase in some value orientations and the decrease in others?

The observed changes in values, which were (probably) triggered by only two days in the outdoors seems rather improbable because value orientations are something persistent. However, nature appears to be a phenomenon that affects human beings in special ways. The philosopher Martin Seel (1996) showed that nature is a sphere that gives not only special opportunities to calm down because nature (as a phenomenon) is not allocated with utility and diction – in contrast to man-made things that are nearly all allocated with utility and diction – but also corresponds in a special manner with an individual’s ideas of life. When nature is perceived as beautiful there is a correspondence with an idea of a successful and “right” life. When nature is perceived as ugly there is *no* correspondence with these ideas of a successful and right life (Seel 1996). But nature is also a special sphere because it corresponds not only with ideas of life but also with liveliness itself. Therefore, nature is a sphere where people can feel connected to the liveliness of the world (Liedtke 2005; Liedtke 2007). From these theories, nature seems to offer special qualities that may explain the changes observed in our study. The way the change in personal values took place is only understandable in connection with the qualitative data from interviews and observation (Hack 2011). Because a differentiated discussion of all changes is not possible here due to space limitations, it suffice to say that it appears that the changes in value orientations lead to a status that better fits an individual’s personal abilities and everyday life.

Table 1. Results of PVQ-survey (figures form 1-6, the lower the figure the more the described person is like oneself)

Item in 21 PVQ	Mean Pre-test	Mean Post-test	statistical significance
<b>Achievement:</b> Being very successful is important to him. He likes to impress other people (Item 13)	3,00	3,07	.00
<b>Benevolence</b> It's very important to him to help the people around him. He wants to care for other people (Item 12)	2,48	2,93	.02
<b>Power</b> It is important to him to be in charge and tell others what to do. He wants people to do what he says (Item 17)	4,23	3,72	.01
<b>Self-Direction:</b> Thinking up new ideas and being creative is important to him. He likes to do things in his own original way (Item 1)	3,03	2,35	.02
<b>Security:</b> It is important to him to live in secure surroundings. He avoids anything that might endanger his safety (Item 5)	3,21	3,30	.04
<b>Tradition:</b> He thinks it's important not to ask for more than what you have. He believes that people should be satisfied with what they have (Item 9)	3,05	3,47	.03
<b>Universalism:</b> It is important to him to listen to people who are different from him. Even when he disagrees with them, he still wants to understand them (Item 8)	2,18	2,47	.00

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# ‘Friluftsliv’ and teaching methods – classroom management and relational thinking

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It is my intention in this short adaption mostly from one of the chapters in my master thesis work in educational science at the University of Oslo (2000), both to refer to what I look upon as some of the most important features and/or qualities regarding ‘friluftsliv’ and teaching – and to describe ‘friluftsliv’ in terms related to a model in Scandinavia often discussed as *a classroom management and relational thinking model*. This model gives us, too – a clear holistic approach as a way of leading people in the outdoors that quite some outdoor educators point out is both the most important factor for a leader in the group process during outdoor activities, and the most important component for such leadership.

Being Norwegian and raised into an outdoor tradition still looking upon ‘friluftsliv’ as “a way of recreating understanding for nature, of rediscovering the true home of mankind, A Way Home” – I have to point out that the word ‘friluftsliv’ for me has a much more limited use than ‘outdoor activities’, applying to activities in relatively untouched nature.

Rather than laying down fast rules for what the activities include, we can say that they show a respect for natural processes and for the realization of all life. They take place without the use of highly technical means of transport and they present a diverse range of challenges to the total person, and are an opportunity for emotional, physical, and intellectual engagement.

We might also get a feel for what ‘friluftsliv’ is by naming a few things it is *not*:

- *It is not sport*, in the sense of physical activity in a selfish, competitive way, staying fit to compensate for an otherwise unnatural and unhealthy lifestyle.
- *It is not tourism*, in the sense of the business and practice of rapid transport through different places.
- *It is not a scientific excursion*, teaching us about the physical processes in nature, collecting specimens of objective interest.
- *It is not a “trade-show”* style of grand outdoor expedition, featuring equipment, tourism, competitive adventures, and display windows for sponsors.
- *It is not outdoor activity*, in the sense of a safety valve for a fundamental against nature aggressive lifestyle. It is not meant to shore up our modern way of life, but to help us – as individuals and as a society – out of it.

‘Friluftsliv’ evokes such strong responses in Norwegian society because it evokes a *national* identity, a sense of really “belonging” to the land. It conveys *social* identity in a two-edged way, both as a “real” Norwegian and as a member of the upper class who must go *back* to nature. Finally, it conveys an *individual* identity in the same way that Nansen described, by paring a person built in the city down to some

sort of “essential” self.

In the Norwegian context, ‘friluftsliv’ is a living tradition for recreating nature-consonant lifestyles. It implies making friends with nature and passionately recreating free nature’s standing in our culture. It is an unselfish “I-Thou” relationship that tries to come away from the anthropocentrism of a nature-dissonant society.

What I regard as the most important features or qualities of ‘friluftsliv’ in relation to teaching methods or conveying methods are represented below by concepts and sentences such as:

- Bringing someone into the ‘friluftsliv’ field has to do with an intermediary activity in free nature; with this activity being deeply related to nature.
- In talking about ‘friluftsliv’ we should focus on the “fumbling and tumbling” – meetings with nature, being part of it, merging with nature, and experiencing adventure; journeying a higher state of nature consciousness.
- Taking someone out in nature the ‘friluftsliv’ way also have to do with cautious practice; acting and dressing oneself with respect to the actual weather, using tools and equipment only as means in finding one’s way, managing the over-nights, and benefitting from teamwork; all of this contributing to a safety margin.

The classroom management and relational thinking model described by Bjørndal and Lieberg.

This model is frequently used in Norway as a model for didactic analysis. It was first introduced and described by Bjørndal and Lieberg in 1975. Their model was developed as a consequence of experiencing various existing models for target-guided planning and organization related to teaching. They found that models initiated by school authorities seldom gave practising teachers assistance of value in everyday practical teaching; in what they termed as “didactic situations”. Bjørndal and Lieberg wished to formulate a new tool that could give an improved focus on the reflective process the planning for teaching should be. Their work produced a model with this crystal-like hexagonal structure, and very often named the *didactic relation model* (figure 1):

The six edges in the model are, named from the top and clockwise: Goals, Framework, Methods, Evaluation, Content, and Ability by participants.

In addition to being a tool for systematic reflections upon every didactic situation, making the teacher more sensitive and self-critical, Bjørndal and Lieberg also wished to give the teacher more responsibility for each teaching situation. They viewed the teacher as an original and creative person; not just a functionary implementing the official curriculum.

Taking the ‘friluftsliv’ features and qualities presented al-

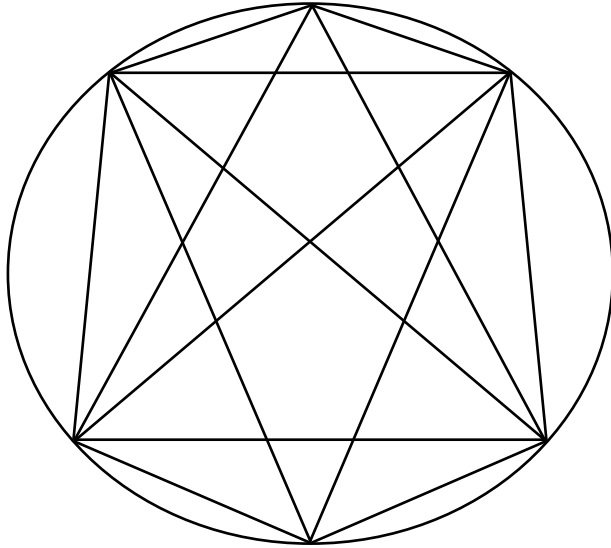


Figure 1. The didactic relation modell (Bjørndal & Lieberg, 1978)

ready, into a modified Bjørndal and Lieberg model, I will present a useful framework for planning, preparation – and performing leadership as well – in ‘friluftsliv’.

The features and qualities I will take explicit into the modified model are as follows:

- Free nature near at home
- Use of tools and equipment characterized by their simplicity
- Important teacher qualifications, such as: Perceiving skills, knowledge, conveying skills
- What the actual group has been taught or has experienced related to ‘friluftsliv’ before
- Being out in the nature in a way that correspond to each participant’s abilities/skills
- Having a security margin

- Taking participants (pupils) out in nature in a cautious way, acting and dressing with respect to the actual weather, using tools and equipment, finding one’s way, managing over-nights, and benefitting from teamwork
- Other qualifications.

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# The need for sustainable management of nature play areas: A survey of environmental impacts caused by children's play

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## Introduction

### *The Emergence and Importance of Nature Play Areas*

In the past 30 years, there has been a substantial reduction in the amount of time children spend in nature. In response, a “children and nature movement” which seeks to reconnect young people with the outdoors is growing rapidly, particularly in the United States. One increasingly popular technique is designating nature play areas (NPAs) in public forests.

Several benefits for children have been correlated with unstructured nature-based play activities. Studies suggest play improves self-esteem, motor function, and classroom behavior, and decreases anxiety, depression, and attention disorders. In addition, time spent in nature when young has been correlated with environmentally-aligned attitudes and behaviors when older.

### *Children's play is a developing recreation challenge*

NPAs are often located in protected natural areas, and managers must therefore balance recreation activities with associated environmental impacts. The existing literature on recreational impacts provides little information on youth-related resource impacts or their management (Clark, et al., 1971; Vander Stoep and Gramann, 1987; Turner, 2001; Hockett, et al., 2010). Despite this lack of knowledge, new plans are being made for increasing play opportunities on public lands.

As more NPAs are developed and opened, land managers will need to know how unstructured play activities of children affect natural conditions and what techniques are available to avoid or minimize such impacts. Best management strategies for NPAs are currently being developed by trial and error. This preliminary study provides the first dataset on what impacts are caused by children during play, where these impacts occur, and what might be done about them. It is complemented by an ongoing study in well-established Sweden NPAs.

## Methods

### *Recreation ecology and play observation*

Three NPAs in eastern U.S. hardwood forests were surveyed. Each had been operated for two to four years, sized over 0.5 hectares, and visited by 3,500–10,000 children annually. Survey methods were adapted from previous recreation ecology studies (Wood, Lawson and Marion, 2006). Additionally, unobtrusive observation methods were developed. At each NPA, trails and recreation sites were measured, trees and shrubs were surveyed, and play was ob-

served. First, each trail was categorized as formal (FT) or informal (IT), based on whether it was manager-created or child-created. Length was measured, and ground cover characteristics, width, and cross-sectional area were recorded using a point sampling method. Control conditions at adjacent, ecologically-similar undisturbed sites were recorded. Second, recreation sites were identified as formal (FS) or informal (IS). Size was measured using the variable radial transect method, and impacts to ground vegetation and soil were recorded. Data from controls conditions were also collected. Third, each tree and shrub over 2.5cm DBH was counted in recreation sites. Size classes were assigned. Extent of damage and root exposure was documented. Fourth, 11 hours of play was observed and resource impacts were noted. At regular intervals, the actions and locations of random populations of children were recorded. Documented impacts included trampling or picking flora, damaging shrubs and trees, digging or moving soil, moving logs, moving rocks, or disturbing fauna.

### *Data analysis*

Trail and recreation site data were compared with controls. Vegetation loss and soil exposure was estimated by multiplying size with percentage difference of ground cover at site minus control. Total soil loss was estimated by multiplying trail length by mean cross-sectional area.

A binary logistic regression model was created to determine significance ( $\alpha \leq 0.05$ ) of child-related factors and their relationship to environmental impacts. Data from observations were used. Factors were treated as independent variables, and included gender, estimated age, and group size. Impacts were considered dependent binary variables.

## Results

### *Use of nature play area features and resulting impacts*

Children played most commonly in recreation sites. IS were used 46% of the time while FS, 29%. FT and IT were used 9% and 3%, respectively. On average, NPAs had two FS (avg. 732m<sup>2</sup>), two IS (avg. 89m<sup>2</sup>), one FT (avg. 78m x 206cm) and three IT (avg. 66m x 69cm). One NPA layout is shown in Figure 1.

Impacts included vegetation trampling, soil exposure and loss, and damage to trees and shrubs. Average decreases in vegetative cover were 61% or 231m<sup>2</sup> (FS), 64% or 63m<sup>2</sup> (IS), 55% or 140m<sup>2</sup> (FT) and 47% or 5.8m<sup>2</sup> (IT). Mean soil exposure increased 28% (FS), 5% (IS), and 34% (IT) but decreased 7% on FT. On average, 0.21m<sup>3</sup>/km (FT) and 8.5m<sup>3</sup>/km of soil were lost due to compaction, subsidence,

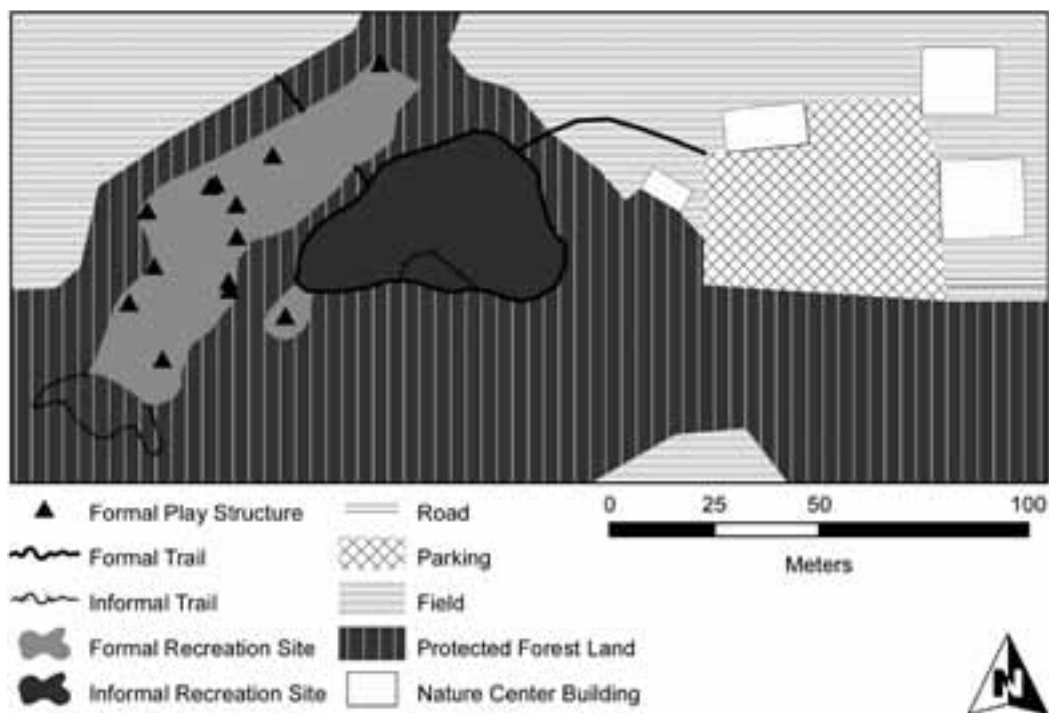


Figure 1. Map of NPA

or erosion. At FS, 48% of trees and shrubs were injured on average, while at IS, 42% were injured.

### Frequency of impact

Based on observation data, children's play in NPAs caused impact 33% of the time. These impacts were primarily related to habitat disruption and included digging soil (15%) and moving logs (6%). Impacts to flora or wildlife occurred less than 5% of the time.

The binary logistic regression model uncovered several significant ties between child factors and impact. Smaller group sizes were significantly more likely to cause any type of damage, move logs, and trample flora, while larger groups were more likely to move soil and rocks. Males were significantly more likely to cause any type of damage, move logs, and trample flora, while females were more likely to move soil. Older children were significantly more likely to move logs.

### Discussion

This study suggests children's play has measurable impacts on the environment. Play may cause long-term ecological

changes, especially in highly visited urban NPAs. From an aesthetic perspective, loss of vegetative cover is the most visually obvious form of impact. Ecologically, the exposure and slow loss of soil is a more lasting and significant impact, along with tree and shrub damage.

Although impacts from children's play are a concern, natural area management often requires balancing preservation and recreation mandates. NPAs and related activities are a salient objective of many agencies and organizations, and their benefits are increasingly being promoted and studied. Additionally, unstructured experiences in nature may help build a new generation of conservationists who will be more supportive of setting aside and protecting natural areas. Ultimately, managers must accept some degree of resource degradation if they choose to promote the societal benefits of connecting children with nature through outdoor play. Preventing avoidable impacts and minimizing unavoidable impacts at NPAs by proper site selection, site reinforcement, and adaptive management is recommended (Leung and Marion, 1999).

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# Parents, housing and children's contact with nature in the city – presenting four “outdoor perspectives”

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## Why study children's contact with nature in an urban context?

Playing outdoors in natural settings is one important feature of a 'good childhood'. Beside this commonly held belief, a growing body of research shows that contact with nature during upbringing can support healthy child development (Faber Taylor & Kuo 2006). Meanwhile work within the field of children's geographies highlights that spontaneous play outdoors is an endangered phenomenon, reflecting both changes in the socio-physical (and technical) environment and attitudes concerning childhood (Holloway & Valentine 2000; Skår & Krogh 2009).

Urbanisation is here to stay. This means that the first surroundings in life will likely provide proximity to people, shops, schools and traffic, but what about access to the green and blue spaces? With children having 'a small daily prism' (Hägerstrand 1970), the qualities and resources of the neighbourhood in general stand out as highly important for them. Facilitating children's encounters with nature is particularly challenging in the larger metropolitan areas.

Leaving the apartment in a medium and high density setting for a house in the suburbs with less traffic, and more gardens and open spaces is a prevailing norm among families with small children in a Swedish urban context, and elsewhere. Now there are signs that apartments in densely built inner-cities are growing in importance as places for families to live (Carrol, Witten & Kearns 2011; Karsten 2009). This development raises questions about the opportunities for children to spend time in and experience nature nearby their homes, in different parts of the city? While the compact city is prioritized in policy agendas, being put forward as an ideal form for reaching a more sustainable urban life, questions concerning open spaces and qualities of children's everyday life in the city is likely to be continuously debated. The study presented here provides to this debate giving insight to families reasoning about their everyday life in the city and possibilities for children's activities outdoors.

The following paper focuses on urban families and how parents view the importance of children's contact with nature. What opportunities have children coming in contact with natural settings, playing outdoors and moving independently where they live in different parts of the city? Is children's nature contact something that is sought-after by parents and does it affect housing preferences or how satisfied they are with their current neighbourhood?

## Method

This paper draws from a study carried out within a dissertation work published in Swedish concerning urban children's relationships with nearby nature. In this study 29 parents of a total of 60 children were interviewed. The average age of

these children was 9 years. About half of the parents lived in inner city apartments in Gothenburg and the other half in suburban houses on the outskirts of Gothenburg, which is Sweden's second largest city with a population of more than half a million. This comparison is made with the aim of highlight differences and similarities in parents' views of two urban environments that, apparently at least, are distinguished in terms of accessibility to nature. On the whole the households in the two samples in the parental study are homogenous with regard to their ethnic background (they are predominantly Swedish) and their educational levels (the majority are highly educated).

## Results and discussions

Although the parents generally speak in positive terms about children playing outdoors they still hold somewhat different views on why and how children's contact is important and on the kind of contact with nature they want to encourage. Their expressions are sorted into four typologies that partly also reflecting parents' views on their dwellings and their surrounding in relation to children's whereabouts and possibilities to reach nature.

- A *city-social outdoor perspective* characterized by 'drinking coffee in the park, or in the close yard, while watching the children play at the playground'. The city and its cultural life are very much sought after and if the parents like it there, they believe that their children also will.
- An *urban-eco outdoor perspective* characterized by 'taking the children on outings where they can build dens and watch birds. Contact with nature is important for creating a feeling of belonging and understanding environmental problems'.
- A *rural related outdoor perspective* characterized by 'children picking blueberries outside the yard and having their own horses. The area in which they live is not a randomly chosen suburb but likely also a place where the parents have family connections, maybe there own childhood grounds'.
- An *activity based outdoor perspective* characterized by 'boating during summers and downhill skiing during winter, it is important to let the children try different activities'.

The rural related outdoor perspective could be as seen as latent in the other perspective, especially among those living in the inner-city (mostly parents representing the first two perspectives) and is given vent to during summer visits to the second home. This results points at the importance of changing environments, not at least for the sake of children. The fact that the Gothenburg inner city is generally



perceived as a socially stable environment makes it an attractive milieu to live in with children. Access to different environment qualities such as snow, sun, warmth, less traffic, open space and calmness could temporarily be achieved in a society characterised by high levels of mobility. However of course this presupposes parents with financial resources. Contact with nature surrounding the second home has the potential to wake the interest of outdoor recreation among children, but these areas can not be discovered independently on an everyday basis, while most of the time still is spent in the neighbourhood. The parents also, therefore, stress the importance of local qualities such as patches of green, access to a semi-enclosed yard and parks in the inner-city, as well as a more active planning of spaces where children can come together in newly developed suburbs.

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# I AM HERE! Participatory exploration of the recreational behavior of adolescents using a multiple media approach

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Young people's perceptions and expectations of recreation in public spaces are different from those of adults. They need space for social interaction without the boundaries and restrictions usually experienced at school or at home.

In the research/education cooperation project *I AM HERE! – Participative approaches to analyse the space behavior of adolescents in the city*, spatial activity patterns and spatial demands of adolescents in Vienna are gathered and analyzed by implementing a participatory approach and using a comprehensive mix of recording devices like GPS, mobile phones and digital cameras. Students from three secondary schools in Vienna, Austria, are involved in the project work. For data analysis and visualization, web-mapping as well as virtual-globe technologies are used. By examining the structure, utilization and social meaning of public spaces we develop a typology of adolescent spaces. In a future workshop with the students we elaborate recommendations to improve the quality of public spaces for adolescents. The results will be discussed with local planning authorities.

## Thematic background

Public spaces and recreational areas are often occupied by multiple demands, and hence spaces of conflicts and sometimes even violence. With the focus on social interaction, adolescents do not apply typical recreation criteria such as scenic beauty, thus shopping malls are often mentioned as preferred spaces – for meeting friends, getting seen and hanging around without compulsory consumption.

The socialization with peers and the values of peers are very important for young people while they oppose the attitudes and opinions of parents and other adults. Places are selected by the opportunity to meet friends and hang out unobserved (Duzenli et al., 2010; Fitzgerald et al., 1995).

Previous research has shown that preferred public spaces of adolescents are the city centers, street corners and shopping malls. The activities in these spaces include hanging out, listening to music, meeting friends and doing sports, though there are significant differences between boys and girls. Boys rather engage in physical activities (sports) whereas girls prefer more social activities such as meeting and chatting with friends (Duzenli et al., 2010; Fitzgerald et al., 1995). Adolescents frequently use the term “chilling” when they describe their favorite leisure activity. It implies diverse activities and atmospheres and is mainly used in the context of meeting with friends in a relaxed atmosphere. The most important factor is to do it with friends and not with parents (Vanderstede, 2011).

Results from Gearin and Kahle (2006) regarding the concerns of adolescents related to public spaces show that smog, dirt, waste and homeless or drunk people are the main disturbance aspects.

## Project description

In a transdisciplinary cooperation with students from secondary schools in Vienna, Austria, we analyze spatial demands, behaviors and activity patterns of young people in the city to support the development of spatial planning strategies that consider specific needs and expectations of its adolescent inhabitants. Main research questions are how adolescents use public spaces, what spatial needs they exhibit, and which social relevance public spaces have for adolescents.

The involved students are researchers and test group at the same time. For recording and describing public spaces, we use GPS technology combined with visual recording techniques such as digital images and videos. This mix of media and technologies links directly to the communication devices and services that young people use and like (smart phones, tablets, social media services...). Web-based mapping technologies such as virtual globes and geo-browsers are used to create mobile applications together with some of the students for adding, exploring, analyzing, sharing and presenting data directly in a real life environment (Schauppenlehner et al. 2011). The GPS technology combined with new media and web applications is evaluated regarding how far these techniques are suitable to collect, analyze and visualize the spatial behavior of adolescents.

## Preliminary results

The use of GPS devices for recording daily tracks and activities is a good starting point for analysis of their spatial patterns and preferred locations. Many students were surprised about their individual routes (e.g. route lengths and duration of stays) and that they have this recording technology in most of their smartphones. Regarding media like images and videos for qualitative description of public spaces, many students felt unsure about what to record. They need very detailed instructions on what to keep in focus.

First analyses show, that the social interaction, especially meeting friends, is the main driver to use public spaces. The availability of time is a very important factor concerning the choice of spaces by adolescents as they have very little spare time due to school times, learning and parental control. They are not willing to spend a lot of their valuable leisure time in public transport to access recreational areas. Places in the neighborhood are preferred to hang out and meet friends.

Conflicts and violence seem to be a serious problem for adolescents in public space. Few of the participating female students experience threats and insecurity in several urban public spaces. Their male colleagues feel more insecure in the public space due to conflicts and fights with other male adolescents or gangs. As a possible solution for that, they

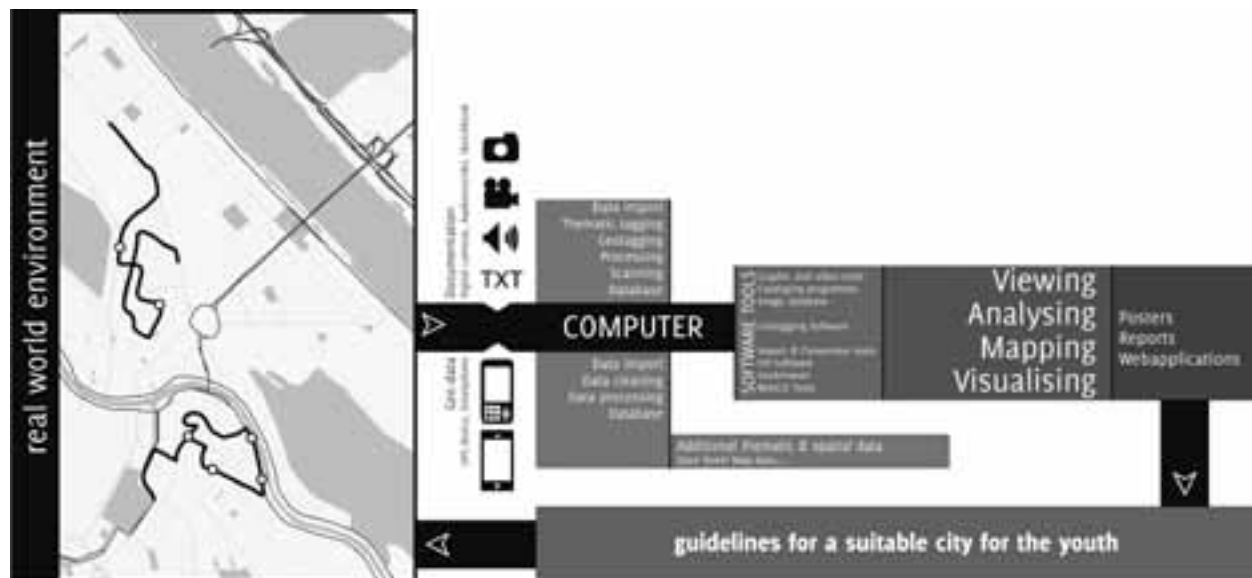


Figure 1. The data processing model

are willing to give up privacy by claiming for more security forces and surveillance cameras.

There are surprisingly different results depending on the location of the school within the urban fabric. While school students from the outer districts use a wide spectrum of recreational spaces (parks, forests, inner-city squares, shopping malls), students from the inner city seem to spend nearly all their leisure time in the immediate urban environment (shopping streets, small parks). Recreation planning for this group needs innovative approaches as their spectrum of space utilisation goes way beyond the responsibility of a parks department.

## Acknowledgement

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## ORGANIZED SESSION: ORAL

## Financing of nature and landscape protection through tourism

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The natural resources build a major basis for tourism. They are a central starting point for generating experience quality for visitors. This concerns the aesthetic as well as the ecological dimension of nature and landscape. Based upon this tourism generates a high turnover in many places. Therefore sound nature, beautiful landscapes and protected areas act to a great extent as an important competitive factor for touristic destinations, regions and tourism enterprises.

On the other side the competition for public funds increases, and there are less and less resources for the nature and landscape protection available. Yet even though the financial assurance of the nature and landscape protection is of great importance for tourism to maintain its own fundamentals, tourism hardly contributes to the financing of the nature and landscape protection. In tourism nature and landscape are still seen as public goods without a market price. The financing of nature and landscape protection is mostly left to governmental and para-governmental organizations as well as to private, tourism-independent organizations. At the same time it lacks practicable models for the financing of nature and landscape protection by tourism.

In the framework of the projected session models and concepts for the financing of nature and landscape protection by tourism and other partners are presented. The advantages and disadvantages of the different models are opposed to each other and discussed. Case studies for the financing of nature and landscape protection by tourism and other partners are presented. The differences between the different countries and regions are elaborated (e.g. outdoor recreation in Scandinavia, nature-based tourism in the Alps, ecotourism in Africa and South America). The following questions are put up for discussion:

- Which theoretical and practical models for the financing of nature and landscape protection by tourism and other partners exist?
- Which concrete examples exist (case studies from various regions of the world)?
- Which strategies help to promote the financing of nature and landscape protection by tourism and other partners in the future? How can the research contribute to this?

We invite interested speakers to propose contributions to this session.

# Maintaining high biodiversity and landscape diversity for and through tourism – approaches for co-financing models

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## Introduction

Pristine nature and aesthetical landscapes form the basic fundament for many outdoor recreation destinations. Studies on landscape perception show that tourists have an overall preference for cultural landscapes with great structural richness and traditional agriculture (Schelsky 1996). In Europe, these landscapes often provide a high level of biodiversity. Main threats are the intensification of farming practices as well as the abandonment of agriculture.

Protecting biodiversity and maintaining traditional landscapes are aims closely linked to each other and can be seen within the framework of the Ecosystem services (ES) concept. To sustainably maintain these ES, Payments for Ecosystem Services (PES) are more and more under discussion (Wunder 2005). The implementation of such instruments by which ecosystem services – mainly public goods – and the protection of biodiversity can be sustained through linking them successfully to market mechanisms, like the tourist economy, is seen as a major future challenge (Job et al. 2011). Through the internalization of these positive externalities produced by farmers or nature and landscape conservation actors for tourism, the costs can be allocated directly to the users of these common goods and market failures can be compensated (Socher & Tschurtschenthaler 1994).

Regional governance models help to understand successful regional cooperation, especially those dealing with public goods. According to Fürst et al. (2005), the most important factors are (a) the regional or local context, so actors have a common sense of place and feel obliged to participate in its development, as well as to build up (b) effective frameworks of common action which are embedded into the existing institutional system with adequate authorities for decision making.

## Existing instruments

Since tourists do not directly pay fees to the farmers for utilizing the landscape, other instruments have been developed and discussed in the past (cp. Socher & Tschurtschenthaler 1994). If the farmer is at the same time a tourism entrepreneur, higher prices for services can include preservation costs. Less direct instruments are subsidies and transfers from the tax payer to the agricultural sector. Each instrument has its pros and cons: for example the latter model also taxes people who never visit the region, whereas the other (farmer as service provider) isn't a practicable mo-

del for all agricultural actors.

In Europe and especially in Germany, financing nature and landscape protection by tourism is not common, but might be a new and widely accepted way. An example for PES can be found in Müntertal (south-west Germany). Traditional farming practices are subsidized by visitors' taxes to maintain the typical scenery of the Southern Black Forest. About one third of the tax (approx. 70 to 90 thousand € per year) are distributed to the local farmers. Generation and distribution of the money and supervision of the management actions are kept in a local context, with actors (e.g. from the distributing institution) having specific knowledge of the local challenges in landscape preservation and often close relationships to the beneficiaries.

## Interviews with stakeholders from the tourism sector

Some effort has been made to figure out the tourists' willingness to pay (WTP) for nature conservation and landscape preservation, and studies found out, that WTP increases with the relation tourists have with the specific object. For instance, conservation measures on a local scale are more accepted than measures on a broader spatial level, like state or national level (Degenhardt et al. 1998).

Only few studies focused on the internalization instruments for nature and landscape preservation through payments by the tourism industry itself. First interviews with stakeholders from the German biosphere reserve "Südost-Rügen" and nature park "Feldberger Seenlandschaft" showed a high interest for transferring the mentioned eco-tax model also to their destination. Beside these expert interviews, a first explorative empirical study for WTP was conducted in the nature park "Ore Mountains" in spring 2012. The survey included over 70 touristic service providers from different branches like accommodation, gastronomy, information or offers.

## Results

An overall majority of the service providers classifies nature and landscape as most important factors for choosing the destination and estimates nature activities (hiking, biking, alpine/nordic skiing, nature observation) as the most sought-after leisure activities of their guests (see Figure 1). The majority also considers conservation areas as vital for tourism development and of high value for touristic attractiveness, such as the conservation of mountain meadows

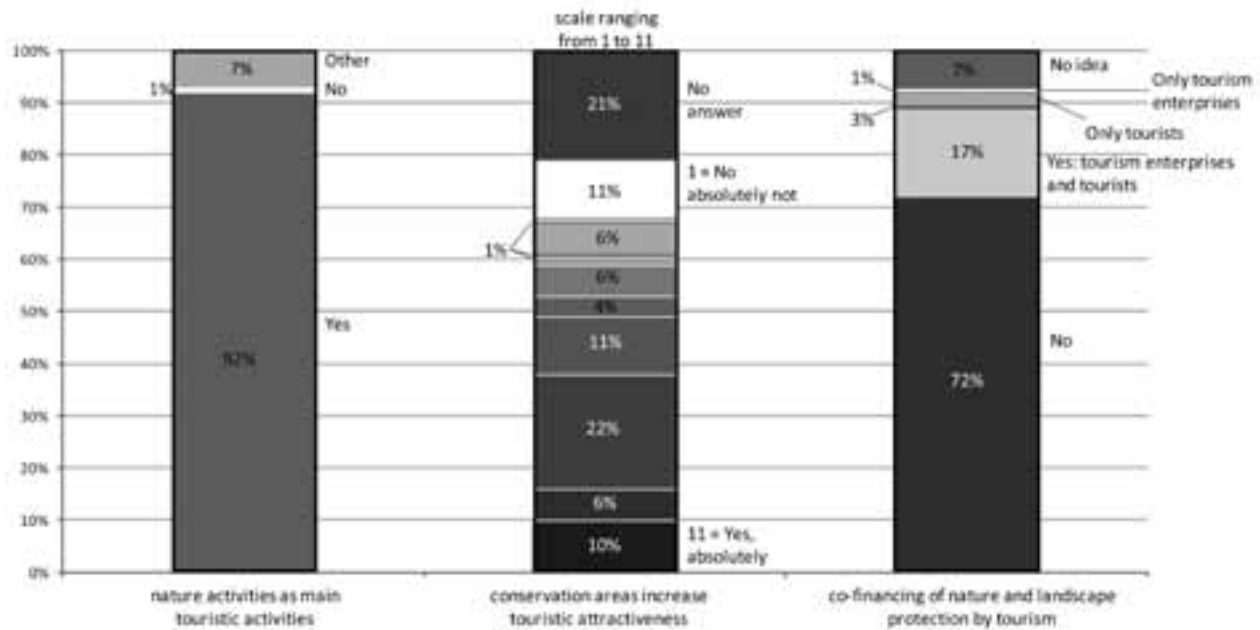


Figure 1. Relevance of nature and landscape for tourism in the Ore Mountains (Germany) and acceptance of co-financing instruments (combination of several survey questions)

or landscape structures typical for the Ore Mountains like stone walls or hedgerows. All interviewees stated a high relevance of landscape protection and management actions to maintain attractive sceneries for recreation. Nevertheless, over two third (72%) of the tourism service providers refused to participate the tourism sector in financing landscape preservation, so the costs remain to agriculture and nature conservation. Only one fifth regarded co-financing as a fair instrument to internalize these costs.

## Outlook

In the next steps, we will conduct empirical studies to figure out the acceptance for concepts of touristic payments for ecosystem services (PES) within the study areas “Feldberger Seenlandschaft” and “Südost-Rügen”. The possibilities for transferring the eco-tax model will be evaluated by repeated expert interviews (using the delphi method). Starting from the hypothesis, that tourism service providers and politicians dealing with tourism agree to financially support landscape protection if the benefits for tourism by preserving regional identity can be clearly seen, the advantages and disadvantages of various instruments should be discussed and synergies between landscape protection and the

regional tourism industry will be revealed, e.g. by sustainably strengthening and maintaining the regional touristic unique selling propositions like characteristic agricultural methods and landscapes. Large protected areas in Germany (such as national and nature parks or biosphere reserves) are marketed with slogans like „living responsibility“ or „living in harmony with nature“. If these principles are meant to be more than mere advertising, visitors should see a difference in nature and landscape to non-protected areas.

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# Financing natural areas in Spain, a weak point of sustainable development: the case of Castilla y León

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Protected natural areas have become an important tool for nature protection in Spain, although most of them are still quite young. Spain had a Protected Areas Act already before 1975, when a long obscure period of lacking a true policy about natural areas came to an end. It also has a special management system where regions have the responsibilities for the environment and associated legislation, but nevertheless many regions do not have a clear idea of what to do.

## Management tools

The National Heritage and Biodiversity Act rules that planning must be a 'waterfall planning process' which includes both management plans and sector plans. These levels are improved by EUROPARC-Spain through an area system plan which affects the whole territory. According to the law, regions have to develop different plans in order to manage and preserve natural areas, but depending on what region is considered, the situation can be very different. Spain has a range of possibilities to study this development. Here, we only want to outline some aspects. There are Autonomous Communities with a long tradition on planning natural areas, like Andalusia, and there are others with a weak planning tradition, like Castilla y León. Moreover, planning means sometimes tools to develop some areas and this lack means in most cases neglect, deprivation, and over-exploitation of some natural resources.

Regarding financial aspects, they seem to have the Marqués de Villaviciosa's old idea of the early 20<sup>th</sup> century, of developing areas through tourism. However, tourism does in many cases not mean sustainable development and financing is an unfinished business in many natural areas. There are many things that need to be done, but very little money for financing them. Local initiatives have been developed inside EU policies, such as FEDER, Leader or Life, with different agents involved. They put the emphasis also on tourism or initiatives based on tourism, but include other issues as well. In this context one should also consider agricultural grants, but agriculture is less and less important in natural areas. We have seen some areas, which have an old history in tourism and with the same problems as the others which do not have this background.

## Financing natural areas

Financing natural areas through public funds is not enough to avoid the loss of their biodiversity. Therefore, it is necessary to increase economic resources. This is an important point to consider, especially in protected areas where development opportunities are needed to maintain populations inside. On the one hand, money has to be provided by different administrations in order to safeguard preservation and conservation, as well as sustainable development in natural areas. However, the amount of money is really an important obstacle and so is the focus on visitors. On the other hand,

many local development groups have obtained grants for local sustainable development initiatives related to tourism. Hence, the outcome is then quite different from the original idea: the development process is not sustainable.

Nevertheless, these areas have important natural and cultural resources to improve their local economies. What is more, many of them have had a better economy in the past, sometimes based on trade because of their location or because of people's background. But nowadays, due to the fact of depopulation and ageing, they have weakly populated areas with few resources to go on and without financial tools to invest into their economies except tourism. According to Work Programme for Protected Areas 2009-2013, the growing involvement of groups from society opens up new opportunities to improve the involvement of society in all aspects of planning and management. This implies new opportunities to financing conservation policies and protected areas through private funds.

## Case study: Castilla y León.

We are to study the case of Castilla y León where planning is weakly developed. According to the above described 'planning waterfall process' the situation can be described as follows:

- Areas system plan: Programa Parques Naturales de Castilla y León. It was declared in 2002, it is supposed to be a plan to develop in a proper way the whole protected areas system, not only natural parks, through sustainable development, conservation, use public. But, in reality, none of them has been developed.
- Management plans: Planes de Ordenación de los Recursos Naturales (PORN). They should be the most important plans for every area.
- Master plans: Planes Rectores de Uso y Gestión (PRUG). They are important management tools that they do not exist in Castilla y León. Therefore, rules for both allowed and not allowed uses do not exist.
- Sectorial plans: different plans for only an aspect, such as conservation or public use. There are very few and only for internal use.

Instead of developing all these plans, brochures and equipment for visitors have been built and also points of information, as a way of development. Natural areas have to be managed properly and managers have to find a way to manage both public and private funds. It is necessary to promote integrated projects based on multifunctional and multi-sector approaches. All things considered, financing natural areas in Castilla y León are necessary to develop their local economy and at the same time safeguard other dimensions of sustainability. Some of the measures that potentially can work in that direction are described in Figure 1.



<b>General measures</b>	<b>Particular measures</b>
Budgets of the various administrations	Not only mining activities
Taxes from activities and proprieties	
Grants	Hunting and fishing licenses
Permissions	
Support for indigenous breeds	Guides, brochures, ...
Pasture and forest restoration	
Provide services into natural areas	
Admission fees	
Donations	Private developers
Voluntary initiatives	Parque Natural label
Environmental certification and labelling	

Figure 1. Proposed measures to finance natural areas in Castilla y León.

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# Biodiversity and tourism: nature conservation in private protected areas in Italy

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## Introduction

Italy has a rich biodiversity worth conserving. It has more native higher plant species than any other European nation except Spain. One out of ten animal species, and 13% of its plant species, are endemic. It also has several populations of rare bird and mammal species. As in most of Europe, Italy has a long history of human civilisation and land use, with a mosaic of land managed for a variety of purposes. Almost 20% of Italy, around 60,000 km<sup>2</sup> in total, has some form of conservation status. Less than 500 km<sup>2</sup> of this, about 0.8% of total conservation areas or 0.16% of the nation's area, is privately owned, but these private reserves contribute to conservation of a number of significant plant and animal species listed in the EU Habitats and Birds Directives. The European Union has nine biogeographical regions, each with its own characteristic blend of vegetation, climate and geology. For each biogeographical region the Commission adopts a list of Sites of Community Importance (SCI) which then become part of the network ("Habitats Directive" 1992/43/EC) to conserve natural habitats and wild fauna and flora. Moreover, the Special Protection Area (SPA) have been designated under the European Union Directive on the Conservation of Wild Birds ("Birds Directive" 2009/147/EC) to safeguard the habitats of migratory birds and certain particularly threatened birds.

## Methods

To assess the contribution of private protected areas to conservation of biodiversity in Italy, we compiled species lists for all the reserves owned or managed by the country's three largest environmental NGOs. These are: WWF, the Worldwide Fund for Nature; LIPU, Lega Italiana Protezione Uccelli or Italian Association for Bird Protection; and Legambiente. Over 90% of these reserves have statutory protection under the EU SCI/SPA schemes. For these, species lists are available from the Italian Ministry for Environment (2012) and EU Natura 2000 (2012). For the reserves without statutory protection, data are available directly from the websites of the three NGOs.

## Results

WWF, LIPU and Legambiente manage a total of 172 private protected areas (PPAs) in Italy, with an aggregate area of ~450 km<sup>2</sup>, i.e. ~0.75% of the total area nationwide with some form of conservation status. Of these 172 PPAs, ~75% (106) are operated by WWF, ~15% by Legambiente and ~10% by LIPU. Overall, ~50% of Italian PPAs are in the Mediterranean biogeographic region, ~44% in the Continental, and ~6% in the Alpine region. Despite the small total area, the reserves operated by WWF, LIPU and Legambiente jointly help to conserve ~30% of species listed

under the EU Birds and Habitats Directives. Birds are best represented, with 76.5% of EU-listed species occurring in these PPAs, as compared to 37.4% for mammals, 56.9% for amphibia, 38.7% for fishes, 31.5% for reptiles, 18.2% for invertebrates and 7.0% for plants (Figure 1).

A total of 324 EU-listed species, across all taxonomic groups, occur in PPAs managed by WWF, 156 in those operated by LIPU, and 60 in those run by Legambiente. For migratory bird species, the corresponding figures are 149 EU-listed species in PPAs run by WWF and 90 in those run by LIPU. WWF PPAs make the largest contribution to conservation of invertebrates and amphibia, with 44 and 36 EU listed species respectively. PPAs run by LIPU and Legambiente, however, support more EU-listed mammals, 21 and 12 species respectively. The numbers of EU-listed plant species recorded from these PPAs are somewhat smaller: 16 in WWF areas, 7 in LIPU areas and only one in Legambiente areas.

## Conclusions

Private landholders and non-government organizations can make significant contributions to conserving biodiversity (Chapela 2000). In particular, government investment in conservation via financial support for NGOs, and information and financial incentives for landholders which utilize existing social institutions and networks may provide an economically efficient complement to public protected areas (Sorice et al. 2011). In Italy as in other nations, tourism is one tool used to generate revenue for private protected areas, and WWF, LIPU and Legambiente all promote tourism in at least some of their reserves. Currently, it appears that they use tourism principally as a public education tool. It would be valuable, however, to examine the economic and employment contributions derived from tourism in private lands in Italy.

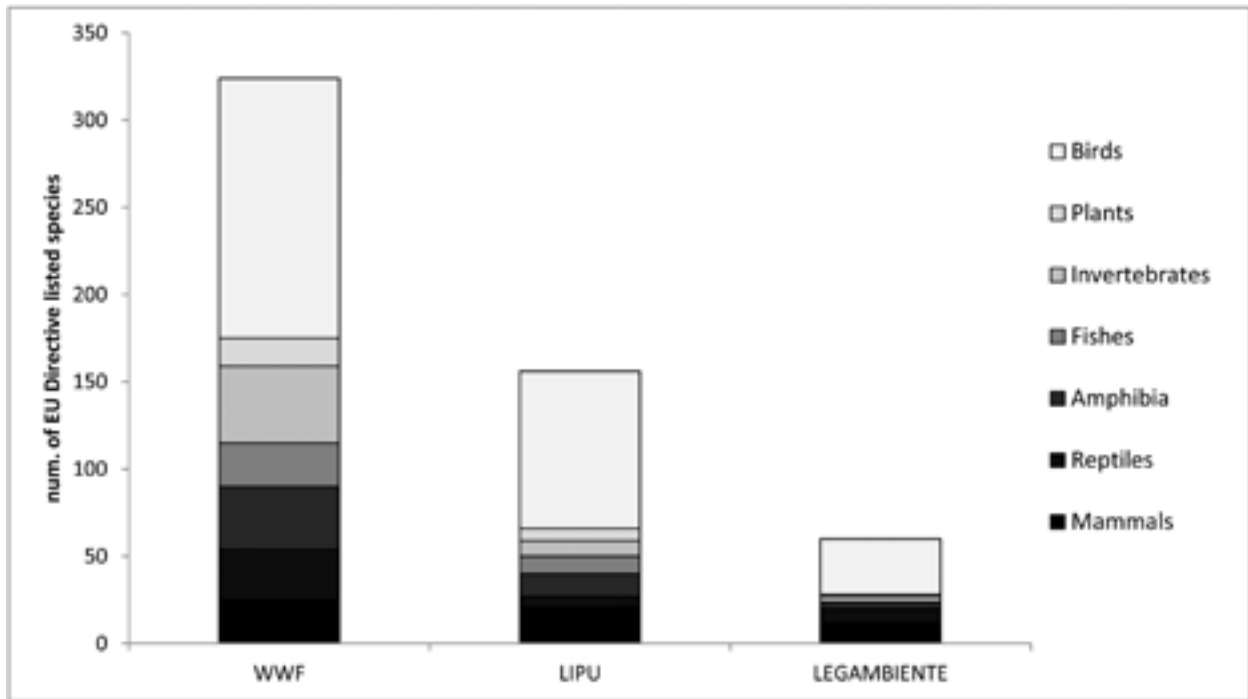


Figure 1. Priority species listed in EU Habitats and Birds Directives conserved in Italy by WWF, LIPU and Legambiente protected areas.

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# Financing of nature protection through nature-based tourism – the case of the European Alps

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## Introduction

The European Alps constitute one of the world's most intensive tourism regions. Alpine tourism is strongly anchored within the alpine societies and of high economic importance. At the same time the Alps comprise a variety of great and very sensitive natural resources (e.g. great mountain landscapes, old cultural landscapes, sensitive flora and fauna). Those natural values build the basis for a predominant part of the alpine touristic product, which consists for a large share of nature sports and nature tourism offers. As those resources are increasingly being destroyed on behalf of building new touristic and other infrastructure, there is need to make alpine tourism more sustainable in order to secure its basic resources (Hammer & Siegrist 2008).

In this context 'nature-based tourism' becomes of increasing importance within the alpine space. Nature-based tourism is a form of sustainable tourism related to nature, which means a responsible stay in natural areas and cultural landscapes close to nature. Visitors are enabled to experience nature and culture in an active way and by using all senses. Nature and landscape as well as the social circumstances are respected, sustainably protected and financed, and a contribution to regional added value is made. The organization and realization of nature-based tourism is developed out of the regional requirements (Siegrist & Gessner 2012).

As sound and attractive nature and landscape build the basis for nature-based tourism in the alpine regions, nature-based tourism itself should contribute to the protection of the natural values. Next to a contribution by means of creating ecologically sound touristic offers and sensitization, there is additionally a need for a direct contribution in a financial way.

Worldwide, various mechanisms exist of how tourism in general and nature-based tourism in particular can contribute to finance nature and landscape protection. This includes entry and usage fees, fees or concessions for tourism services, various taxes as well as voluntary contributions (see figure 1). The financial contribution for these mechanisms comes from either various touristic stakeholders like tour operators or destinations, or from guests themselves, and goes either directly to touristic regions or protected areas, or to a central pool (mostly the government or a protected area organization) in order to be – sometimes only partly – further allocated. (Dickhut 2009, Kuenzi & McNeely 2008, WWF 2009)

## Methods

In the context of our research about nature-based tourism in the Alps, one core issue is the financing of nature protection by nature-based tourism. Next to the analysis of literature and documents, a series of guideline-based interviews with

various experts of nature-based tourism and nature protection in the alpine space are carried out. Central element of the research is an alpine wide online-survey. It examines, next to other aspects, the importance of nature-based tourism to play an active role in the financing of nature protection, and the evaluation of various financing mechanisms in the alpine context.

## Results

The examination of the financing mechanisms and their applicability within the Alps confirms that such financing mechanisms still receive little attention in the touristic practice. The protection of nature as a public good without a market price is still mainly financed by governmental institutions as well as private non-touristic organizations. The contribution of tourism itself to the financing of nature protection is very small. Whereas most case studies are situated in development countries in Africa and Asia and are strongly linked to protected areas, only few case studies exist regarding financial contribution of tourism within the alpine space and even central Europe (e.g. a nature tax in the black forest in Germany or the cultivation of a vineyard in the Swiss Valais by an incorporation which is mainly financed and actively supported by guests (Bieling 2009, WWF 2009).

The evaluation of the financing mechanisms and case studies allows several conclusions concerning the requirements towards the financing of nature protection by nature-based tourism (see figure 1):

- The applicability of the mechanisms in the Alps depends on a broad range of framework conditions, which are regionally different. Factors like the social development, the specific political situation and the significance of the various stakeholders in a certain region might promote or hinder the application of a financing instrument.
- Challenges might also be the lack of public and private funds, legal and institutional obstacles or the opposition against additional fees for nature which is seen as a public good and is in some opinion already paid for by tax payers.
- In order to apply a mechanism, also risks should be considered; for example the government might recall its funding if alternative funding arises, or regions might feel more pressured of competition by elevated fees.
- Success factors might be the integration of relevant stakeholders, the characteristics of fees (amount, way of imposition, application of funds, control mechanisms) and the combination of established and new funds.

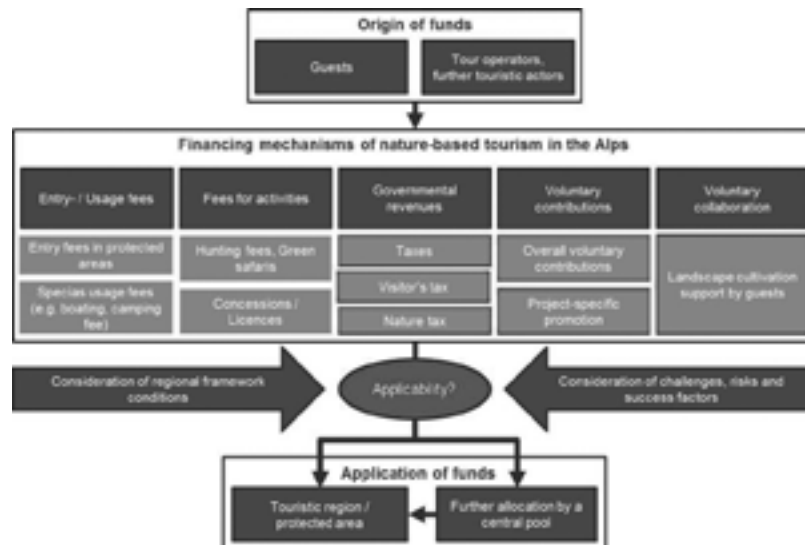


Figure 1. Financial contribution mechanisms of nature-based tourism to nature protection in the Alps (most relevant mechanisms are framed in red); Source: own illustration

According to these requirements and the special framework conditions in the Alps, certain mechanisms are supposed to be of special relevance: These are governmental revenues like hotel or visitors' taxes, voluntary contributions of tour operators or guests for financing natural areas or concrete projects, as well as the voluntary collaboration of guests in concrete nature protection projects as an indirect contribution. Entrance or usage fees for natural goods might have to deal with large acceptance issues.

First results of the online-survey show that a strong majority of the requested stakeholders (fully) approves the question that nature-based tourism should make a financial contribution to the protection of nature and landscape. Considering the various mechanisms, governmental revenues, charges for non-sustainable offers or commercial activities of protected areas are rated most appropriate for the alpine space. However, the role of these findings regarding adequate financing mechanisms in the alpine space considering its specific framework conditions has to be analysed.

## Conclusion

The research shows that there are various options for a direct financial contribution of nature-based tourism to na-

ture protection in the Alps. Yet they still receive little attention and face some challenges that mainly arise from particular political and institutional circumstances and the special tradition of tourism in the alpine context. In order to get a better understanding of the applicability of the various financing options, more detailed research is needed to bring together the worldwide experiences, to analyse them regarding framework conditions, strengths/weaknesses, success factors and the applicability to the alpine regions. Therefore, the various mechanisms might also be discussed and tested by means of selected pilot regions within the Alps. Based on this research, the focus should be on increased sensitization of actors involved and the illustration of concrete possibilities for actions.

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# Selling nature? – Building customer relationship management (CRM) systems for nature areas

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The Dutch government policy related to biodiversity and nature conservation shows two main trends. The amount of financial support is diminishing drastically in conjunction with a strong decentralization trend away from central government towards the regional level of the provinces. In this changing policy context there is an increased demand for community-based appreciation of ecosystem services to support nature protection. To halt the current loss of biodiversity in the highly urbanized and densely populated Netherlands it is essential to understand the way nature areas and biodiversity are appreciated (Sijtsma et al. 2012a; Sijtsma et al. 2012c). Nature areas are generally seen as public goods, the provision of which is logically in governments hands. However, in the Netherlands, due to the financial crisis less government means are available to support these public goods, fueling a search for new funding and new support by nature conservation organizations. What can nature conservation organizations learn from organizations operating in private markets?

Organisations providing private goods and services face a an enduring trend in society towards individualization (e.g., Hoekstra et al. 1999, Prahalad and Ramaswami 2004), which becomes apparent in consumers becoming more demanding and well-informed, and desiring products and services corresponding exactly to their specific needs. As a result, heterogeneity among individuals increases, which weakens the role of background characteristics such as demographics in consumer behavior. Illustrative in this respect may be the fact that ten years ago, wireless carriers managed three demographic segments, while nowadays they need to manage 20 need- and value-based segments (Day 2011). Organizations that want to be successful in this changing market environment, need to be customer-driven (Franke et al. 2009), requiring capabilities in the fields of market-learning (i.e., learning from – potential – customers, Day 2011), and customer-linking (i.e., creating and managing relationships with customers), based on knowledge of individual customers. Such knowledge is derived from so called CRM systems, that may store data on individual's behavior (e.g., donations, visits, preferences, volunteer work), interactions (contacts through different channels), lifestyle profile etc.

The aim of the paper is show the possible content of a spatially explicit Customer Relationship Management (CRM) system for nature areas as a basis for new funding and support strategies. This CRM can be built on the basis of first of all a richer and deeper understanding of the appreciation of nature areas by different people and the spatial structure of this appreciation. Aggregate knowledge of needs and desires (for instance based on market research) is no longer sufficient. Rather, in order to increase stakeholder

appreciation for and involvement with nature areas, decisions about communication with (potential) visitors (e.g., which message, through which channel), about the specific offers to make (e.g. discount on entrance fee, guided tours with limited access) should be based on knowledge of individual needs and individual behavior (Franke et al. 2009). Second, due to different forms of distance decay the location of the different nature areas is important and especially their degree of proximity to urban agglomerations.

In this paper we focus on the Netherlands and the largest private nature conservation organization: Natuurmonumenten. For the appreciation part of the CRM we use among others data from the hotspotmonitor databases ([www.hotspotmonitor.eu](http://www.hotspotmonitor.eu)). The University of Groningen and Netherlands Environmental Assessment Agency (PBL) in cooperation with Alterra have since 2010 successfully cooperated to develop the hotspotmonitor ([www.hotspotmonitor.eu](http://www.hotspotmonitor.eu)) in which, to date, approximately 5000 geo-located respondents have marked specific natural areas in their neighborhoods, their regions, and throughout the Netherlands that they find to be highly attractive. Figure 1 on the left hand side shows the nationally most preferred spots from a survey of 3300 respondents. Analysis indicates that most of the high biodiversity nature areas of the Netherlands are mentioned, which indicates an indisputable correlation between appreciation and biodiversity. The right hand side shows how these preferences differ for scales (local, regional or national) for two example areas (Arnhem and Groningen). The database furthermore contains specific information on the cultural ecosystem services the areas provide for the respondents. Respondents have indicated why they find the place attractive, how often they visit the place and what activities they undertake at this place. Analyses of this information can shed new light on the services provided by specific nature areas.

We first present the general approach and how we used these data in defining a typology of nature areas. In this typology areas differ as to whether they are locally appreciated, regionally appreciated or appreciated on a national scale for instance. Second we present how we classified customers/appreciators of nature areas according to their lifestyle, using an newly developed transparent method. Finally the paper explores how both the typology of nature areas and the refined view of lifestyles could add valuable information to support new customer based management strategies for nature conservation organizations. Key in this will be the creation of online communities around different nature areas. The need to learn from individual customers is enhanced by today's increasingly networked society, in which individuals interact easily with other individuals and with organizations through social networks and other me-

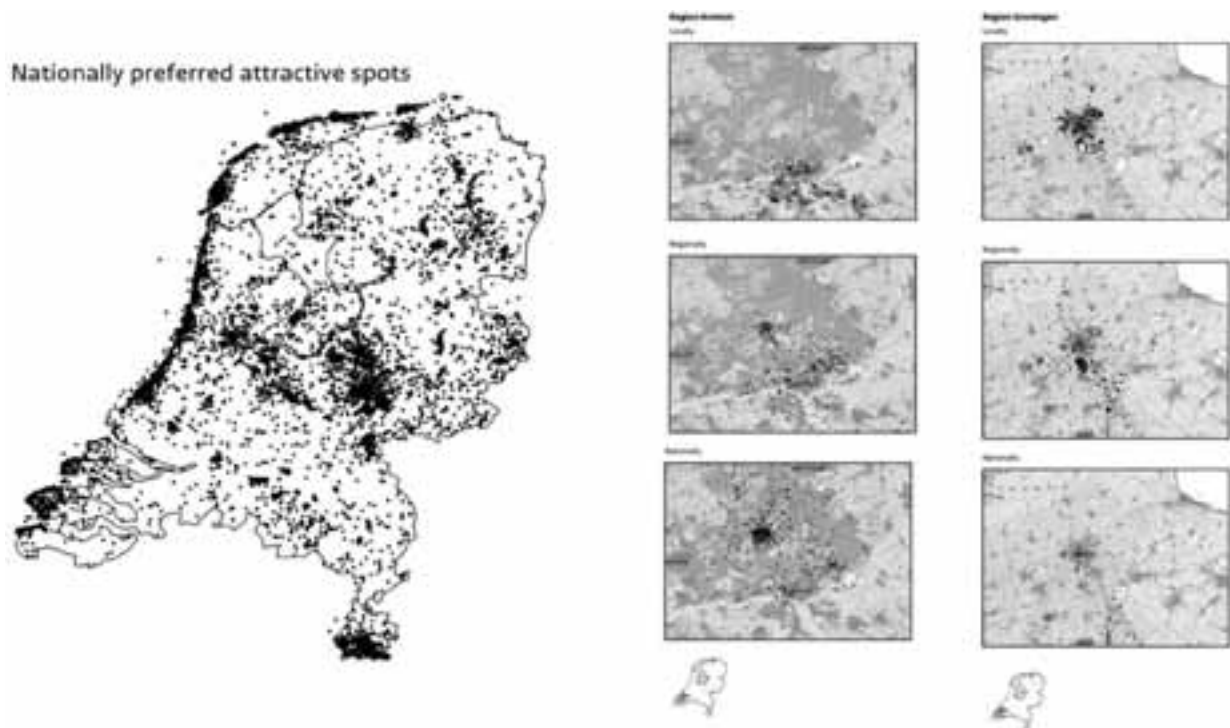


Figure 1. Selected results from the hotspotmonitor database (Sijtsma et al. 2012b)

dia. When these interactions have a brand or firm focus, it is referred to as customer engagement behavior, or 'behavioral manifestations, beyond purchase, that result from motivational drivers'. Examples of customer engagement behaviors are blogging and providing word-of-mouth through Facebook, but also engaging in co-creation activities, volunteer work, collecting donations etc. Such activities, when stimulated and closely monitored and streamlined by nature conservation organizations (Day 2011) may give a powerful tool for new funding and support for nature areas.

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ORGANIZED SESSION: ORAL/PANEL

## Tourism, hiking trails and local development

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The purpose of this session is to examine the state of tourism activities related to hiking and local development. In recent years there has been an increase in the practice of hiking in rural areas. This activity has suffered transformations in recent decades moving from leisure to a tourist activity that can increase the number and period of stay of tourists generating economic benefits locally, contributing with the maintenance of young population in rural areas, job creation, rural diversification, urban regeneration and tourism development. This type of tourism is an alternative to the target areas, which can be inserted into local development strategies. In addition, we must consider the diversification of tourist activities and the pressures that go with it and its links (glocal-local, urban-rural). In some cases these activities radically transformed the territories becoming active agents of change at the level of environmental, economic and social development.

The session invites papers related to these aspects as well as the relationships between tourism experiences, motivations, impacts and the hiking trails.

# The footprints of tourism: Environmental sensitivity and impact of tourism on hiking trails in Iceland and Japan

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The number and size of protected areas (PAs) has grown steadily in recent decades. PAs are designated for various reasons, and managed to balance conservation needs and human interests. Often, PAs are means by which governments can preserve an area of particular interest for future generations. These areas are often spaces characterized by delicate ecosystems, and are thus very sensitive to human impact. In many cases, the designation of a national park is welcomed by local business to promote tourism. However, with consistent increases in tourism, and especially hiking, in these sensitive areas, the threat of land degradation increases, making proper management of nature-based tourism and conservation critical.

Most research into the environmental impact of tourism focuses on the measurement of physical and ecological parameters, and, has been conducted in vegetated rather than less vegetated areas. Whether the findings are generalizable to less vegetated areas remains unknown, but is an aim of this study. The impact of climate as an important factor influencing ecosystem degradation in PAs has not been investigated in association with ecological sensitivity to determine environmental sensitivity, although research suggests the importance of different climate factors (e.g. Li et al., 2006, Liu and Liu, 2010, Tomczyk, 2011). Our research is the first to integrate various climate factors to complete an environmental sensitivity analysis using the less vegetated areas of selected case sites in national parks in Iceland and Hokkaido (northern Japan).

Hiking trails can be used as an indicator of tourism-related degradation in PAs. This research combines environmental sensitivity with the assessment of hiking trail degradation, using well-known hiking trails at the case sites. We combine ecological sensitivity modelling (Ólafsdóttir and Runnström, 2009) with climate modelling to create an environmental sensitivity analysis. Three ecological factors were assessed to create the ecological sensitivity: top soil, vegetation cover, and a digital elevation model (DEM). Basing the climate model on existing DEM data enables us to account for micro-climate in particularly large areas of mountainous PAs. Our model is based on the assessment of temperature (e.g. solar radiance), precipitation (e.g. topographic wetness index), and wind direction. The climate model combines these factors and is incorporated in the ecological sensitivity analysis to derive the environmental sensitivity. For the hiking trail assessment, we used a regular measurement interval of 100m, to measure four indicators: trail width, trail depth, overall vegetation cover change, and erosion type. Leung and Marion suggest that to ensure a high resolution of data, the measurement interval has to range around 100m (Leung and Marion, 1999). Measurement intervals shorter than 100m would increase the accuracy for further analysis, but at the expense of much higher costs (e.g. time

for measurement and analysis), and longer loose accuracy for assessing the whole trail (op. cit.). We also extend the existing method of hiking trail assessment to acknowledge the specific needs of more barren environments, by adjusting the factors according to hiking trail zone, the resilience of the vegetation and top soil to physical impacts. The environmental sensitivity (theory) and the hiking trail assessment (reality) are compared (Figure 1).

Current results show that there is a higher ecological sensitivity of the terrain in Hokkaido than in Iceland. In Japan, 94% of the land shows a medium and 6% high sensitivity, whereas in Iceland 37% of the area show a low and 63% medium impact. We used the measurements of the hiking trails, but adjusted them according to the additional impact zone, and the prevailing vegetation and top soil. This adjustment yields in a more accurate representation of the reality of the trail and its potential for future degradation. The results of the hiking trail analysis show that the adjustments factor shift the average of measurements away from lower impact towards a higher impact (especially in the case of Hokkaido). In Iceland, the peak impact on hiking trails shifts from low impact towards medium impact. Comparing the measurements from Iceland and Japan, we see that the majority of hiking trails in Hokkaido show a much higher impact than the trails in Iceland. Most trails in Iceland show a medium impact (43%), whereas in Hokkaido most show high impact (63%). We speculate that this difference could be accounted for by higher use of trails in Hokkaido than Iceland, since sufficient data about hikers are missing in Iceland. Incorporating the climate model, it can be seen that it accounts for a change in that sensitivity classification. The analysis is not complete, but will be presented at the conference. Initial analysis with solar radiance suggests that the climate model adjusts the ecological sensitivity in the way that it fits more with the reality, which derives from the measurements of hiking trails.

Comparing the sensitivity of the area at the point of measurement along the trail, it can be seen that the measurements show a much higher impact on the trail, than the sensitivity analysis would suggest at the same point. This is because the measurement of the hiking trail represents a much finer resolution than available from measuring the trail in the field, then the environmental sensitivity analysis model in the computer. In addition, the difference suggests that the degradation of hiking trails has already reached a level exceeding the carrying capacity set by the environmental parameters, and the capability of the environment to regenerate and overcome the physical impact of hiking. Notably, the difference between the measured impact on hiking trails and the environmental sensitivity of the area also differs, even though the assessment uses only the initial measurement of impacts.

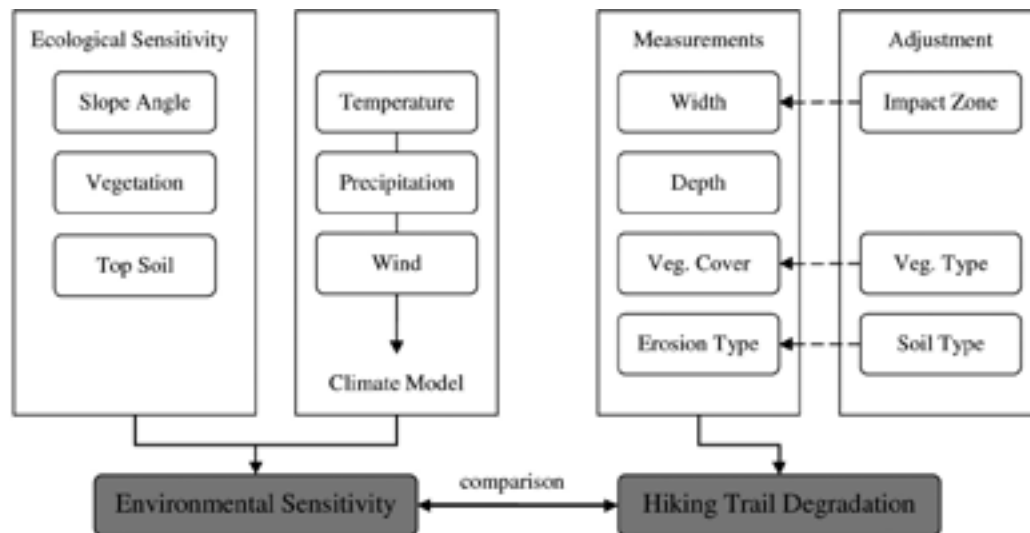


Figure 1. Comparison of Environmental Sensitivity (theory) and Hiking Trail Degradation (reality)

These preliminary data indicate that climate modelling is a key parameter in environmental sensitivity analysis. Temperature and precipitation have an important influence in the model to understand hiking trail condition and degradation potential. We show that the combination of environmental sensitivity analysis with hiking trail assessments is crucial to providing the necessary resolution of measurement points to make accurate judgments of actual trail conditions in mountainous PAs.

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# Implementing the Trans Canada Trail 2017 connectivity plan in Northern Ontario, Canada: Tourism, hiking trails and rural development

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Despite a long history of natural resource extraction, many Northern Ontario communities are beginning to see tourism as a means of regional redevelopment in response to fluctuating natural resource extraction sectors (Johnston & Payne 2005). As such, Northwestern Ontario's burgeoning tourism industry was developed in the 1990's through the addition of hunting, fishing and cottaging operations (Johnston & Payne 2005). Boyd & Butler (1999) remarked that Northern Ontario has "a specific Canadian identity and image ... [and] ... inherent natural appeal" (pp. 123) that draws tourists. However, infrastructure is minimal, and "with respect to trails there is an urgent need to develop a more extensive system and network to improve access, as well as open up the region to a range of ecotourist types" (Boyd & Butler, 1999, pp. 123). The success of tourism development projects in the regions are dependent upon their ability to garner sufficient social capital, including government support, and funds to cover capital and other project costs, and to foster sustained buy-in from local stakeholders.

This paper examines the potential economic benefits of, and stakeholder engagement in, the proposed development of a rail trail in Northwestern Ontario, Canada. The Trans Canada Trail (TCT) was founded in September 1992 in Prince Edward Island by Bill Pratt and Pierre Camu. The Trail has since become one of the largest volunteer projects in Canada; once completed, it will be an estimated 22,500kms. From 1992–1994, TCT established relationships with trail organizations and user groups across Canada. Now, TCT is developed at the provincial and territorial level with trail organizations in every province and territory assisting locally. Over 400 local trail groups, municipalities and conservation authorities build and manage local sections of the Trail. Provincial and territorial organizations, i.e. Trans Canada Trail Ontario (TCTO) have provincial or regional coordinators who facilitate development with local organizations. Through its head office in Montreal, Canada, TCT brands the trail and provides funds for local trail construction.

In 2009, TCT undertook a Trails Master Plan called the "Connection 2017 Strategy" which identified 200 gaps in the trail, totaling 6,000 kilometers. This document formed the basis for provincial coordination to connect the gaps. There are currently 41 gaps in Northwestern Ontario equalling 1500 km, one of which is being addressed through the development of the Kinghorn Project. Initiated in 2008, the proposed TCT Kinghorn Rail Trail will span 111 kilometers from Nipigon to Thunder Bay, passing through the communities of Red Rock, Dorion and Shuniah along the abandoned Canadian National (CN) Kinghorn rail line

(Figure 1) and paralleling much of the proposed Lake Superior National Marine Conservation Area (LSNMCA).

The development of this multiuse recreational trail is being completed through a partnership between local stakeholders, trail users, and communities including representatives from TCTO, the municipalities of Nipigon, Red Rock, Dorion, Shuniah and Thunder Bay, the Ontario Trails Council, various trail user groups, including the Voyageur Trails Association, and private citizens. These groups have varying levels of representation on the Kinghorn Project Working Group and the Kinghorn Project Advisory Committee. The project also has a full time Coordinator who reports to the Working Group and facilitates project objectives. Completion of the Kinghorn Project will provide valuable trail infrastructure and create a multi-community tourism attraction within the region; furthermore it will provide valuable connections to other regional trail networks.

Historic and present Kinghorn Project progress was compared to Saarinen's (2006) community based tourism approach and to key drivers of successful regional development (Moneypenny, n.d.) in order to evaluate the Project's capacity and to conduct a Strengths Weaknesses Opportunities and Threats (SWOT) analysis.

The main strengths of the Kinghorn Project include industrial clustering, a baseline for / of progress, and improved project facilitation skills (ibid). The Advisory Committee and Working Group consist of regional stakeholders, the VTA and CN have signed a Letter of Intent to pursue a lease agreement for the rail bed, and regional tourism operators and trail groups exist who will use and maintain the trail once completed – all of which represent increased cooperation between locals and have the potential to lead to the development of an industrial cluster. The Kinghorn Concept Plan and Feasibility Study created a baseline for progress, and funding was secured for a project coordinator improving project facilitation; the Northern Ontario Trail Coordinator continues to provide mentorship to local trails-based businesses and user groups.

Weaknesses include poor systems thinking (ibid) as evidenced by the inclusion of unrealistic phased development in the feasibility study which was misunderstood by several community representatives and stakeholders who lacked sufficient tourism development knowledge and misunderstood the objectives of a Feasibility Study vs. a Work Plan.

Opportunities related to the Kinghorn Project include capital funding through TCT (50%), funding to develop a Business Plan, support from local development and funding agencies and collaboration among stakeholders. As such, the development of a rail trail presents a significant



Figure 1. Proposed Kinghorn Rail Trail Route

potential economic benefit for the region.

Threats to the completion of the Kinghorn Project include difficulty combining social and financial capital (Monypenny, n.d.), and issues around capacity and governance (Moscardo, 2008). These issues include: dominance of external agents (ibid), difficulty sustaining a competitive advantage (Monypenny, n.d.) with the emergence of the Lake Superior Heritage Coast Project, lack of local skills and tourism knowledge, and lack of an effective regional tourism association (Moscardo, 2008).

Some of the main barriers to enacting a community based tourism approach include the increased time required to make decisions (Moscardo, 2008), resulting in lost funding opportunities combined with difficulties ensuring widespread community and stakeholder representation as well as lack of a defined communication strategy and lack of tourism knowledge and capacity for participation among smaller municipalities and other regional stakeholders.

Support for the Kinghorn project from local community gate keepers, including stakeholder representatives, business owners and government officials, will be the key to the success of this trail development project and will ensure mutually beneficial and effective tourism development. Interconnecting the proposed trail with regional tourism entrepreneurial development will provide opportunities to stimulate regional tourism development in Northwestern Ontario, in addition to providing valuable skill development, career training and future employment opportunities.

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# Megatrend hiking and trekking? – A narrative synopsis of market research data, media reports and further presumable indicators

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In the last few years, hiking and trekking have attracted large media attention as modern trend sports. Furthermore, in the few scientific publications on this market segment, a high significance has been assigned to hiking. The widely consistent media opinion has been adopted in academia without any examination. The assumption of the hiking trend has not yet been reviewed, despite the financial support by regional and tourism politics for the development of hiking tourism destinations in Germany and in the Alps. Therefore, the aim of this paper is to verify the trend thesis by a narrative review of available studies of market research institutes. In Germany, private institutes – not official statistics – conduct representative, demand-side surveys at the place of residence. So, data are commercial and are not subject to disclosure requirements.

Data research began with web pages of market research institutes specialized in tourism and named in the relevant literature, and ended with backtracking market research results cited in scientific publications and German daily and weekly newspapers. All surveys representative of the total population and, in some way, available to the public have been considered for the analysis of the significance and the development of hiking and trekking. Based on those German market research data, this paper shows that hiking is indeed an important leisure and holiday activity. However, its popularity is declining rather than growing.

The study also contains a narrative synopsis of media reports and developments of markets that are related to hiking and trekking. The descriptive analysis of media coverage is based upon an unsystematic monitoring of print media, and a systematic examination of the online archive of two German newspapers with nationwide coverage. The following hiking and trekking related markets have been chosen: firstly, tourism trade fairs and their special themes – they have been studied using the example of the three most visited fairs, secondly, the market for sports goods that has been analyzed by market research data, and thirdly, tourism destinations. The importance of the hiking and trekking segment for the marketing of tourism destinations is shown descriptively using German and Austrian examples. The developments found there were the opposite of the “real” hiking and trekking developments. In connection with the repositioning of stagnating traditional destinations, hiking and trekking attract growing attention. The paper closes with recommendations for tourism service providers and some methodological conclusions on handling secondary data and indicators.



# Theory and reality of the field guide profession in a protected area

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## Introduction

The creation of protected areas can, in some cases, change the economic and social dynamic of a region. Local economic development is extremely important for achieving successful conservation of these areas.

An analysis of the role of guides was carried during the preparation of the Management Plan for Alto Ribeira Touristic State Park – PETAR. It is well understood that guiding is not only an important financial activity to the local community, but that it also subsidizes natural resource protection by conveying to visitors important conservation values, while improving the quality of the visitor experience.

The study area, located in southern São Paulo State, is widely known for its steep terrain with associated low agricultural value. The entire Ribeira River basin was never a part of the economic cycles of São Paulo State, such as sugar cane or coffee bean cultivation nor industrial development. Features such as difficult access, distance from urban centers, low demographic density, lack of basic services and poverty favored the conservation of great areas of priceless natural and cultural heritage (Lino and Mourão, 2003).

PETAR is known for its exceptional natural and historical sites, features that focused economic development principally towards tourism. The State Park harbors natural wonders such as caves, waterfalls, rivers and also very diverse fauna and flora. Cultural attractions are also extremely relevant, such as viewing sites, historical constructions and local community arts and crafts.

The Park became popular due to the increase of nature tourism and educational field study trips. This popularization led to an increasingly more professional level of guiding and to the requirement that all visitors to the caves be accompanied by a guide. As a result a local economic boom occurred, with an increase of hospitality services, mostly through the construction of or improvements to accommodations in villagers' dwellings.

The most visited sites are close to the Bairro da Serra neighborhood, where yearly visitation averages from 21,511 to 4,963 visitors, respectively (period from 2006 to 2009). Cave visitation demands special caution regarding environmental fragility and visitor safety. With that in mind, PETAR regulations forbid cave visitation without a certified guide.

## Methods

PETAR guides, working during the period from December 2009 and January 2010, responded to a series of open and closed questions. From a total of 60 working guides, 14 participated on the interview.

Interviews took place at the main touristic arrival site, as there is no specific place where all the guides meet. In order

to avoid interfering with the guides work and visitors' experience, interviews were done during their free time, breaks, or while they waited for clients.

## Results

In spite of the fact that guides have worked an average of 12 years (reaching a maximum of 33 years) they have only attended a few training or capacitate building courses. Besides the basic monitoring course (pre-requisite for all guides), first-aid courses are the most common (64% of all interviewed), followed by geology (57%), both very important for those working in caves.

Other courses mentioned, although less popular among guides, include climbing techniques, rescue, speleological practice, poisonous animals, botany and history. One guide claimed to have taken the basic training course only once, despite the fact that he has worked in the field for nine years. First-aid courses must be taken every three years.

All of the guides interviewed work mostly inside the Park rather than outside, and 100% of the guides work at the Santana site, followed by Ouro Grosso (64%), Casa de Pedra (43%) and, Caboclos (21%).

Half of the guides chose to be a guide as their desired profession. The other half indicated the lack of job opportunities was the main driver to choose this professional option. One important benefit from adventure tourism is an increase in employment opportunities with an increased demand for local guides that are familiar with local conditions and challenges. Approximately 60% of those interviewed stated that it wouldn't be possible to live only on guiding employment.

Only those guides who work full time are able to make a living from the profession, but as there is little regularity of visitation during the week therefore only a few of them can count on a full schedule. One possible consequence of this situation is a long term decrease in guiding quality.

Among the occupations chosen by guides, construction is the most important, with 41% interviewed working in construction. Other activities include arts and crafts, bartending, farming, security and tourism related occupations, such as hotel or restaurant services. When asked about their most desired profession to pursue, if they had no restrictions, only one of the interviewed guides stated that guiding would be his chosen career.

This situation may drive guides to not invest on their own professional training due to lack of time. They spend their free time working on other activities to improve their financial welfare. In addition, the feedback indicated that the time invested on training courses did not guarantee positive returns.

Therefore, even recognizing the guiding profession's rele-



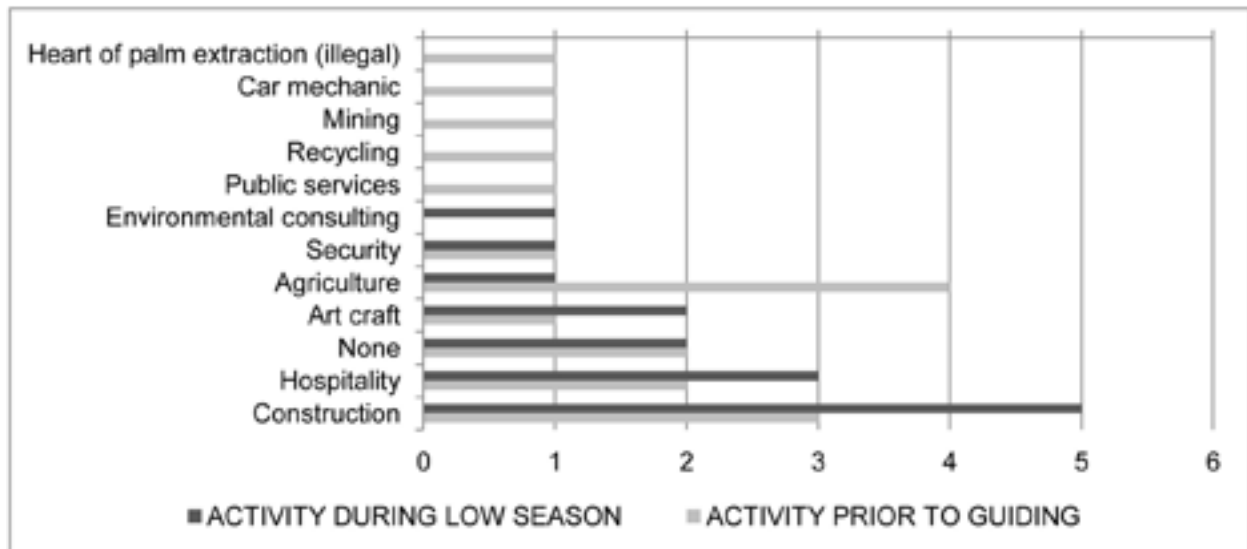


Figure 1. Interviewed guides activities prior to guiding and during low visitation times of the year.

vance to the Park's conservation (50% interviewed fit into this category) and its relevance to the visitor's experience quality and general safety (43% interviewed), guides do not seem to make efforts to enhance their professional training. Family financial security is the highest priority and for that reason any free time available seems to be invested on other working endeavors.

Local development based on ecotourism depends greatly on local community acceptance relating to economic changes. It is necessary to create an integrated planning framework that involves local and regional institutions working to organize visitation and tourism marketing to create visitation strategies during low visitation periods.

As stated by Davenport et al. (2002), it is clear that ecotourism, under certain circumstances, is able to contribute greatly either to natural areas conservation or to the local economy. Nevertheless, it is not the complete solution to the conservation challenges encountered at the present time.

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## ORGANIZED SESSION: ORAL

## Visitor monitoring in a landscape context

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Over the last 20 years, the notion of “sustainable tourism” has emerged as the dominant paradigm for managing visitor use in parks and protected areas (Eagles and others 2011; Manning and others 2011). At the same time, efforts like the European Landscape Convention (ELC) have emerged that emphasize landscape-based approaches to environmental management in order to achieve “sustainable landscape planning, protection, and development” (Jones and Stenseke 2011; UNESCO 2011). The development of landscape-based approaches like the ELC will have important implications for sustainable outdoor recreation management at destinations like parks and protected areas. Specifically, the introduction of a landscape perspective raises at least three basic questions: (1) how will the destination concept now be defined, (2) how will various actors be affected (e.g., management agencies, tourism service providers, etc.), and (3) how will the visitor experience be impacted or enhanced? This session will provide a forum for discussing monitoring-specific issues that result from the intersection of a landscape perspective – as articulated in the ELC – with the contemporary notion of sustainable tourism management in parks and protected areas.

# The governance strategy of the Dolomites World Heritage Site – From carrying capacity to carrying capability.

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The Dolomites World Heritage Site – inscribed on the UNESCO World Heritage List on June 2009 – are widely regarded as being among the most attractive mountain landscapes in the world, as millions of people testify coming from all over the world to visit it every year, both in summer and winter. The Dolomites WHS are inscribed on the List as a serial site since they appear as an organic whole even though they have a complex structure both from the geographical/landscape and the geological/geomorphological point of view. Like an extraordinary “fossil archipelago”, the Dolomites WHS constitutes a select set of exceptional geological features and landscapes, characterized by extraordinary representativeness and high levels of protection, and it is connected by a network of genetic and aesthetic relationships [Micheletti, Gianolla and Panizza, 2008].

## The governance strategy of the Dolomites WHS

The mechanisms put in place to guarantee the conservation and enhancement of the site originate mainly from the choices on the basis of the conceptual ‘construction’ of the site. In other words, this means ensuring that the management strategies and development policies descend logically from the strategies implemented for constructing the serial site. The guiding principles are: networked management, harmonisation, participation and cooperation.

### *From a serial site to networked management*

The concept ‘networked management’ is a consequence of the interpretation of the seriality of the site, in which the nine component sites are seen as interrelated parts in terms of the universal value of the entire WHS. This concept was recognised as good practice by UNESCO. The management is based on enhancing the specific territorial features by means of functional networks – which interpret the serial structure of the WHS – and by harmonising management actions to select those elements that are common to all the component parts [FD4U, 2011].

The overall management strategy acts as a multiplying factor to strengthen the effectiveness of each aspect of management and facilitate interaction and the creation of synergy between the territories in a dynamic system, taking into consideration the fact that every form of local government has developed in response to the needs of its territory.

The vast number of stakeholders operating within the WHS is the result of the particular geo-morphological configuration of the Dolomite mountains, which are divided into many isolated groups making them unusually accessible, and also due to the fact that historically, these areas feature the highest number of stable human settlements in

the Alps, many of which are pre-historic in origin and located at a very high altitude. This means that the Dolomites are one of the most densely populated mountain areas in the Alps, characterised by deeply rooted and highly developed traditions, cultures and management systems.

Furthermore the Dolomites are one of the most famous mountain landscapes in the world and in some areas the visitor levels are already at or over capacity.

For this reason the strategy deals with a comprehensive approach for recreational use covering the WHS, its buffer zones and considering appropriate links to a wider region, in order to maintain the Outstanding Universal Value and conditions of integrity of the WHS. The method chosen for assessing critical points and the potential for the status of recreational use in the WHS is the carrying capacity assessment (CCA).

### *From carrying capacity to carrying capability*

To assess the CC is particularly complex in a serial natural site as varied as the Dolomites. In fact, the Dolomite region includes full-grown tourism destinations, for which it is extremely important to invest more in environmental conservation, and others rising, for which it is essential to set carefully projects of environmentally sustainable tourism from the start.

This complexity requires a specific approach to CC, although recognizing that the experiences and methods developed in the planning of the CC in protected natural areas have more and more evolved in recent years [Manning, 2007].

In particular, it has gone from the use of physical and ecological parameters – relatively easily to measure – to the use of socio-demographic and socio-cultural parameters, more complex to evaluate [Russel and Rey-Vallette, 2007]. Nevertheless, the cultural resources have been included amongst the non-renewable resources in few cases [Seidl and Tisdell, 1998; Nurse, 2006]. This finds an explanation in the fact that the concept of carrying capacity has been applied particularly in natural areas visited, but not lived in, by man. In the case of the Dolomite range however, where man is present and lives in the mountains since prehistoric times, a clear distinction between natural and cultural resources is difficult and pointless. In fact, over centuries of habitual visiting, man has become an integral part of the life cycle of these areas.

Planning the carrying capacity of the Dolomites has therefore imposed a new process, putting the methods applied to date into context. The main idea consists in evaluating the cultural diversity not only as an entity to preserve but as an activity (as active elements) capable of intervening on



Figure 1. The Dolomites World Heritage

the positioning of the bottom-line for defining effects. A dynamic rather than deterministic interpretation of the variable indicators derives from this, that is the measurable elements and the standards, the limits within which to keep the values of the indicators. Consequently the process of repetitive indicator-standard relations becomes interactive, since the variation of “importance” of the indicators entails a parallel “adaptation” of the limits, as happens in a dynamic system.

In this perspective the focus shifts from the “capacity” to the “ability” of the territories, interpreting them as active and not passive subjects of transformation. The term “carrying capability” would express this active perspective, considering the complex of aptitudes that allows a complex system as a serial site to interact with the evolutionary phenomena that involves itself.

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# Outdoor recreation destinations as model regions for adaption to climate change and protecting biodiversity

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## Introduction

Outdoor recreation destinations depend on biodiversity, which is threatened by climate change, land use changes, but also by tourism. Key challenges for the future of these destinations include development of strategies to protect biodiversity and to integrate climate change issues. The Biosphere Reserve "Südost Rügen" (Baltic Sea coast), the Nature Park "Feldberger Seenlandschaft" (North German lowland) as well as the large protected areas "Feldberg-Belchen-Oberes Wiesental" (Black Forest mountain range) and "Allgäuer Hochalpen" (alpine area) are model outdoor recreation regions and cover the most important German landscape types.

## Semi-structured interviews with stakeholders

First, we analyzed the individual perceptions of the central topics (climate change, tourism, biodiversity and their inter-relations) of different regional key stakeholders from recreation, nature protection, planning, local authorities, land managers, forestry, agriculture and regional development institutions through data collected in semi-structured interviews. Interviewees were selected according to the principle of maximum contrast (Hunziker, 2000). Study data suggest that there is sensitivity among all persons selected for the interviews that more efforts are necessary to protect biodiversity as a key resource for outdoor recreation. Climate change was not perceived to be a severe problem by many interviewees and many study participants expressed the believe that climate change would benefit tourism in Germany. These statements are also backed by other studies (e.g. Deutsche Bank research, 2008). Most interviewees do not feel it is necessary to take action on a regional level, which, however, is mandated by the German National Biodiversity Action Plan (BMU, 2007).

## Workshops in the study regions

In each study region key stakeholders were invited to discuss their statements in informal workshops. By using focus groups (Krueger and Casey, 2009) and an open space approach (Owen, 2008) we offered stakeholders opportunities to bring in their own priorities and topics for coalition building.

In the workshops, we first presented results from the interviews with a focus on the study region along with findings from other regions. We also presented maps of perceived hotspots for biodiversity loss and impacts of climate change as well as impacts of tourism on biodiversity and climate. In the workshop, we discussed four core questions:

- 1) What is "biodiversity" in the context of tourism? How can tourism contribute to its protection?
- 2) Do energy landscapes, especially biomass production and wind farms as a reaction to limit climate change affect recreation? If so, how does tourism respond? Can outdoor recreation destinations influence energy landscape design?
- 3) How can climate-neutral mobility be enhanced?
- 4) What forms of cooperation between different stakeholders already exist in the model regions?

To stimulate discussion, we also presented examples from all regions identified as "good practice" by some of our interviewees. The intention was to test whether they were seen as suitable for all study regions. We presented eco-friendly accommodations, the eco-tax model of the Münstertal municipality in the Southern Black Forest, free of charge public transportation for tourists (Black Forest) and the legally binding planning category "tourism destination" or "tourism development destination" in the Federal State of Mecklenburg-Western Pomerania that bans the construction of wind turbines in the designated outdoor recreation destinations Südost-Rügen and Feldberger Seenlandschaft.

## Results

Overall, quite little cooperation within the regions exists. The invited key stakeholders both from tourism and nature protection rarely meet to discuss tourism in the context of climate change and biodiversity issues in any of the study regions. Although managing institutions like park authorities and tourist organizations exist, a person or institution responsible for bringing together different stakeholders is missing. Only within the Biosphere Reserve some more intense approaches to stop climate change and biodiversity loss were seen.

As seen in the discussion with the participants, awareness for biodiversity in tourism is mainly related to landscapes patterns, colors and different vegetation types. However, there was a strong interest to raise awareness especially among tourism for the habitat and species level and this issue was identified as a main topic for cooperation and coalition building in the model regions.

No consensus was reached on wind turbines and their impact on recreation. In all study regions, a number of stakeholders perceive it as an attractive part of contemporary cultural landscapes and they were seen as landmarks for outdoor recreation destinations being part of the German energy revolution. Others demanded to provide recreational landscapes free from wind turbines. Landscapes without

wind turbines like those in Southeast Rügen were seen as having a “unique selling position” for marketing because they are distinct from other German and Danish coastal destinations.

Electrical powered bicycles were seen as the ideal means of climate neutral mobility for longer distances in all of the study regions. To some extent, this may compensate for a lack of public transportation in sparsely populated destinations like Feldberger Seenlandschaft or solve traffic congestions in Southeast Rügen.

In all model regions, interesting coalition building exists in improving management of visitor flows and awareness-raising among tourism for biodiversity on a species and habitat level. Tourism stakeholders were especially interested in promoting low-carbon emission accommodations as a key issue for marketing to gain extra bookings. Also the example of experiences with eco-taxes was of great interest in all model regions.

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# The moral landscapes of Dovrefjell – Exploring relationships between morality and landscape in the struggles over a highly valued mountain area in Norway

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This paper explores the relationships between morality and landscape in the struggles over use and management of the Dovrefjell area. Dovrefjell is a mountain area in Norway with strong natural, cultural, symbolic and economic values and meanings. Dovrefjell has both high recreational value and it is an area of great environmental significance – in particular as a vital habitat for wild reindeer. In a trans-disciplinary study, the relations between the requirements of wild reindeer, people's recreation patterns and rural development based on Dovrefjell's resources, have been examined. The present paper is based on interviews with stakeholders and document analyses from this study. Grounded in past and present re- and devaluations of the landscapes of Dovrefjell, different stakeholders mobilise different moralities regarding landscape and nature.

Throughout history the landscapes of Dovrefjell has served many different purposes, and the area's resources have continuously been re- and devaluated. While *reevaluation* means assessing the value of something once again, *devaluation* is to reduce the worth or importance of something. Both these processes have been taking place at Dovrefjell, regarding environmental, cultural, economic as well as symbolic values. How different groups of people have valued, and seen the purpose of, Dovrefjell has changed along with wider changes in society. There are traces of human activity at Dovrefjell dating back 9000 years. Historically, the area has been a vital arterial road, but also a barrier, between north and south, and east and west. Because of its central location and majestic mountains, Dovrefjell has also become a national symbol for Norway, and its symbolic meaning was solemnly manifested when the Constitution of Norway was adopted in 1814, and the Constituent Assembly, after finishing the negotiations over the Constitution, stated that they would remain "in agreement and faithful until Dovre[fjell] falls" ("*evige og troe til Dovre faller*").

Since the late 1880s, Dovrefjell has also been valued as an area for outdoor recreation. During the 20<sup>th</sup> century The Norwegian Trekking Organisation (DNT) established several tourist cabins at Dovrefjell, and one of them was Snøheim. In the post 2<sup>nd</sup> World War period the national firing range, established at Dovrefjell in 1923, expanded and in 1959 Snøheim was taken over by the military, (shortly after being erected). After a long process fuelled both by the military's need for more space and environmental protection concerns, the firing range was closed down and relocated in 2005. The area that used to be a firing range was then decided incorporated with the protected surrounding area, and at present a massive renaturation project is taking place, removing all traces of military activity. The Snøheim tourist cabin has now been taken over by DNT and reopened. The military built several roads in the area, among

them the 14 km road into Snøheim – *Snøheimvegen*. It was originally decided that this road should be part of the renaturation project, but whether or not *Snøheimvegen* actually will, or should be, removed has been highly debated.

Dovrefjell has a rich flora and fauna, and certain species have been protected for many decades. In 2002 Dovrefjell and Sunndalsfjella National Park was founded, replacing the smaller Dovrefjell National Park, founded in 1974. Surrounding the National Park are several other protected areas. Currently, there are discussions and tensions along different dimensions regarding how Dovrefjell should be managed. Daugstad et al. (2006), point at a "three-dimensional complexity" in these discussions, highlighting use-protection, nature-culture and local-central (management) as three different axes on which the stakeholders dynamically place themselves in complex ways.

The concept of moral landscapes addresses the inter-relationships between moral assessments and landscapes. It concerns how landscapes both shape and reflect moral values, and how moral boundaries are naturalised in and through landscapes (Setten and Brown, 2009). Setten and Brown highlight four approaches to studies of moral landscapes. In the present paper, these four approaches are used and adjusted in order to form an analytical framework to demonstrate how morality and landscape at Dovrefjell are entangled. (1) *Conduct in place* is what Setten and Brown terms the approach where landscape forms a stage upon which the moral judgements of people and practices are made. What is appropriate behaviour in a certain landscape? In the interviews there are for example statements about what kinds of tourists are "wanted" at Dovrefjell – namely "mountain people" with backpacks rather than car drivers with suitcases in the boot. (2) *Moral practice and landscape* refers to the assumption that people's relationships to their surroundings are expressed through practice, and that these practices also shape landscapes. Practices and landscapes are co-constituted in a process involving moral judgements and assessments. These processes have been obvious in the continuous re- and devaluation processes at Dovrefjell. For example, revised moral valuations were drivers both when the firing range was established and when it was closed down, causing landscape changes which in turn caused changed practices. (3) *Landscape as polity* is the expression of law, justice and culture through landscape – landscape as an organised entity developed in the interrelationship between the physical landscape, formal institutions, custom and tradition. One can look at Dovrefjell as polity in terms of how various managerial bodies have taken into account community, culture, law, morality and custom in their management of the landscape. (4) *Landscape and social justice* addresses the claim that landscape can produce and reproduce



power relations and social identities. At Dovrefjell there is a struggle over which “truths” count, with contenders in this struggle different users and interest organisations as well as management bodies and researchers. Dovrefjell as a national symbol might also contribute to maintain existing power geometries.

The present paper demonstrates that the landscapes of Dovrefjell both shape and reflect different moralities, and that these relationships play a profound role in different stakeholders’ assessments of environmental values and impacts.

# New challenges for managing sustainable tourism in protected areas: an exploratory study from a landscape perspective in Sweden

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## Introduction

Over the last decades, the notion of sustainable tourism has emerged as the dominant paradigm for managing visitor use in parks and protected areas (e.g., Eagles and others 2002; Frost and Hall, 2009). At the same time, efforts have emerged that emphasize landscape-based approaches to environmental management in order to achieve sustainable landscape planning, protection, and development. The European Landscape Convention (ELC) is one example of such a growing trend worldwide (Amend and others 2008; Brown and others 2005; Phillips 2003; Jones and Stenseke 2011). The convention provides a policy framework for European landscapes and calls for close collaboration between national and local authorities, private organizations and the public (Jones and Stenseke 2011). The ELC also calls for substantial levels of public engagement in defining landscape values and boundaries while also invoking the 'subsidiary' principle, whereby landscape issues must be addressed in concert with the population most impacted. Jones and Stenseke (2011) summarize some of the challenges with the convention:

“, the ELC contains a number of innovative features... [by providing] a new definition of landscape. It applies to all landscapes, not just selected ones, and underlines the diversity of landscapes as a value. It emphasizes that landscape is not an exclusive field for scientific and technical specialists but the concern of everybody, and advocates an enhanced role for public participation in landscape issues.” (p. 5).

The development of landscape-based approaches like the ELC will have important implications for management of outdoor recreation at destinations like parks and protected areas. What happens when, in the same geographic space, values from a protected area visitor perspective differ from values from a landscape perspective? What forms of governance will be used to integrate a landscape perspective into protected area management?

This study explores issues that result from the intersection of a landscape perspective, as articulated in the ELC, with contemporary approaches to managing sustainable tourism in protected areas in Sweden. It also considers how a landscape perspective may affect destination development in a protected areas context, and how it may affect key actors responsible for implementing the ELC with respect to protected areas.

Although the notion of landscape has been defined and understood in different ways, contemporary landscape researchers tend to agree that landscape is “*not just the land itself, but the land as seen from a particular point of view or perspective. Landscape is both the phenomenon itself and our perception of it.*” (Wylie, 2007: 7). The intersection and synthesis between culture and nature lies at the very heart of landscape studies, especially in research about resource management and development policies (Benediktsson, 2007; Mels, 1999; Wall-Reinius, 2011; Whatmore, 2002). Western approaches to resource management tend to divide nature and culture into separate and sometimes mutually exclusive administrative categories such as wilderness, nature, culture and society (Mels, 1999; 2002; Wall-Reinius, 2011), and natural and cultural resource management is consequently rarely integrated even when these resources share the same geographic space. The ELC contains several provisions that seek to promote sustainable landscape development in new and innovative ways. For example, the ELC is the first international treaty that deals with landscape as an integrated entity or whole system (Jones and Stenseke 2011). At the present time, Sweden has no policy to guide management of landscape as an integrated, multi-sectoral phenomenon. In this paper, we discuss that policies which aim to maintain specific landscape values are primarily built on an understanding of nature, culture and history, which separates them from each other through conceptualizations and institutional structures.

Data were collected using qualitative semi-structured interviews and snowball sampling techniques. Interview data were analyzed for themes and patterns that emerged from the data, including stakeholder perceptions of implementation conflicts along with the strengths and challenges of integrating a landscape perspective into management of sustainable tourism. The sample included representatives from government ministries, national governmental agencies, regional authorities, protected area managers, non-profit organizations and university professors. Data analysis is currently underway however, since the ELC was ratified in Sweden as recent as 2011, we anticipate that this study will help establish an empirical foundation to inform the ELC implementation as well as future research looking at landscape and tourism issues from a protected area context. Since the ELC was ratified in Sweden relatively recently, it is unlikely that all study participants fully grasp the intent of the convention or its implications for sustainable tourism management in Swedish protected areas.

## Preliminary findings

Study participants interpret the concept of landscape and the ELC's notion of landscape differently. Early results from the interviews show that some of the key actors are skeptical about the viability of managing something which is so vaguely defined. Several participants expressed concern over what exactly is to be managed if the concept of landscape applies to all landscapes and can be defined in infinitely different ways. Study participants also appear to define or operationalize landscape largely in ways that reflect or support the interests of their organization.

A related theme from the interviews has to do with conflicts of different land use interests. Land use and landscape management in Sweden occurs primarily through the specific interests of specific actors (e.g., Environmental Protection Agency; National Heritage Board, National Forestry Board, Transportation Authority, Agricultural Authority) pursuing specific objectives. Consequently, several study participants from regional and national governmental agencies noted the fragmented and discontinuous approach landscape management in Sweden, which, ultimately, leads to difficulties in identifying, minimizing or preventing conflicts.

Despite the challenges of implementing a landscape-oriented approach, several study participants identified a strong sense of opportunity with such an approach. For example, one manager of an internationally recognized protected area commented on how the ELC will help amplify their existing approach to sustainable development. According to this study participant, it is precisely because of the ELC's holistic approach to managing landscape that creates new and previously un-envisioned opportunities.

Finally, study participants acknowledged the simultaneous need and challenge for undertaking a landscape oriented approach. A common barrier discussed by several interviewees was the lack of staff capacity for conducting the kind of community engagement envisioned in the ELC. Nearly every study participant emphasized the linkage between "real" community engagement and the long-term viability of landscape-oriented approaches.

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# The Lavazé pass – Negotiating tourism development and landscape diversity

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Regeneration of an existing high altitude resort according to an innovative model, based on the remarkable natural values of the area (Natura 2000 sites, UNESCO sites, wetlands and the most southern pinewood of *Pinus cembra* L. of Europe), and sustainable development (conversion of existing buildings, use of renewable energy sources and integrated mobility systems).

## The ‘Lavazé pass’

### *Landscape characteristics*

Located in the South Tyrol (I), the Lavazé pass (1,800 meters altitude) is an area of remarkable landscape value and with an ancient tourist tradition (since from the end of the XIX century), although on the decline. Beautiful and now relatively unfrequented, it extends into the heart of the Dolomites World Heritage Site – between the two component sites of Bletterbach Gorge and Latemar-Rosengarten massif – and offers a complete sequence of still intact cultural landscapes, both Alpine and Dolomite.

It is in fact an Alpine pass frequented by man since pre-history and also a mountain pasture plateau, which has always been linked functionally to the stable settlements of the valley bottom. The woods, pastures, grasslands and many rural infrastructures which make up its landscape diversity are still administrated by one of the oldest institutions for collective actions in the Alps (the Magnifica Comunità di Fiemme, 900 years old). This institution corresponds to a social-economic unit based on the concept that the commons are indivisible and inalienable. In fact its main interest is to guarantee the reproducibility of the natural resources which symbolically represent the community itself [MCF, 2009]. For this reason the administrative boundaries of this collective property correspond to an ecosystem. The area has also a long tradition of tourism but with deterioration problems due to the transit of motorized traffic and a consequent loss of appeal.

## The ‘Lavazé project’

### *Project interventions*

The Lavazé project is a landscape regeneration strategy that follows an innovative model, based on sustainable planning, the use of renewable energy sources (biomass and solar) and public mobility systems (car-free areas, electric-powered transport systems, etc). The aim of the project is to create a local tourism model with a strong identity through interventions of landscape governance, regeneration and interconnection of open spaces and above all redemption of the local cultural matrix. The plan is based on complementary functions: i.e. it examines in detail the relationship between the resources of natural habitat (hydrology, morpho-

logy and vegetation) and those of human habitat (soil use, types of settlements, public spaces and road networks) with the aim to reduce environmental fragmentation and to develop energy chains and smart grids. It also intends to present a case-study for the reduction of the effects of mobility on Dolomite passes laying underground the part of the road that run across the village.

The main expected result of this intervention on road network is the re-establishment of the landscape and hiking continuity, connecting two different component parts of the Dolomites World Heritage Site and a Natura 2000 site (a peat-bog of high altitude, which existence is directly linked to the hydraulic behaviour of the little alpine lake of Lavazé). In order to make that, the project is based on three landscape planning principles: connectivity conservation, participatory process and negotiation.

### *Connecting natural values*

The Lavazé project represents an experimental implementation of a wider connectivity conservation project concerning the entire Dolomites World Heritage serial site that we are coordinating for the Dolomites UNESCO Foundation and the Italian Ministry of the Environment. The connectivity conservation approach, promoted by IUCN / WCPA [IUCN, 2008], is a landscape planning method based on establishing inter-relationships among identified natural areas (protected areas), through various types of functional connections like landscape corridors, linear corridors and habitat stepping-stones [Worboys, Francis and Lockwood, 2010]. The purpose is to mitigate the effects of environmental fragmentation on species, communities, ecosystems and ecological processes [Bennett, 2004]. It is therefore a method that does not focus so much on the conservation of certain restricted areas (core zones), but on the careful management of the surrounding connection areas (buffer zones).

### *Updating traditional management rules*

Linking landscape and local community, the Lavazé project is based on a contractual principle which reinterprets the ancient rules of management and administration of communal property in a modern key. The project calls for a local strategy, elaborated by means of a participatory process which includes everyone involved in the area (Municipalities and Magnifica Comunità – commons, cross-country trails managers, farmers and animal breeders, tourist and cultural operators), who use the collective management principles traditionally developed by these alpine cultures: regulative and administrative autonomy, sharing, reciprocity and collectivism. The elements of the project are in fact shared and formulated by everyone involved, then they are set out in a written agreement – the ‘Lavazé Integrated



Figure 1. Cross-country skiing is the most important winter outdoor activity in the Lavazé pass. On the background: the Dolomites World Heritage.

programme for Landscape Regeneration’ – on which the constitution of specific management consortium is based.

#### *Negotiating tourism and landscape diversity*

Finally the project is based on negotiation. In fact the excessive specialisation in tourist activity risks weakening the strong physical and mental tie which determines man’s sense of belonging to his own territory. Once the area begins to be “lived in” only in function of tourism, it ceases to have any value in its own right. The main principle is therefore to negotiate, that is to find points of agreement between two different systems of values: the landscape diversity as product of the interaction between nature and local culture on the one hand, and tourism as product of a global culture on the other hand. These two worlds are now not separable. With this principle of negotiation the project wants

to consider landscape diversity as the common good of a specific community, and would to operate on tourism as a vehicle of local specificity rather than an instrument of global standardisation.

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# Swedish-Norwegian regional cooperation increases access to outdoor recreation for people with disabilities

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Along the North Sea Coast Line in the West Coast Region of Sweden and in counties along the Oslo fjord in Norway, the 'Coastal Path' was established already in 2006. The path was regrettably not accessible for all. Approximately 20 % of the population has a diagnosis of a disability restricting their everyday life. "Disability" is here in general terms sorted into five different categories: Difficulties with sight, difficulties with hearing, difficulty with moving parts of your body, cognitive and mental problems, and finally difficulties with allergy or related problems. It has also been established that physical inactivity is linked to many physical problems such as blood pressure problems, risk of diabetes, different cancer forms and other types of illnesses (Barton & Pretty, 2010).

People with a diagnosis of disability, are more often in low mood and have generally a lower self-esteem. This in turn affects the immune systems negatively. For this category of people, green environment provides a very important health service. A significant improving effect on mental health has been shown even at short durations of green exercise such as five minutes (Barton & Pretty, 2010). Studies of the linkage between the mental health and 'Green Exercise' are recently analyzed in more depth. For instance, it can be shown that exercise in green environments improve mood and self-esteem. The presence of water gives greater effects than sites in inland areas (Barton & Pretty, 2010).

Improving general health standards for persons with disabilities was only one of the reasons for Uddevalla Municipality to initiate a project to follow up the earlier Coastal Path project. A second goal was to promote outdoor recreation tourism since tourism volumes to the area increases every year and give increasing job opportunities. A third aim was to make outdoor facilities known to people with less experience of outdoor recreation, for instance immigrants and young people. The project was named "*Outdoor activities accessible for all*" and combines resources and efforts of fifteen municipalities and seven regional organizations in the counties Västra Götaland (Sweden), Östfold and Akershus (Norway), facilitated by economic support from the European Union Cross-border Interreg Programme.

## The freedom to roam and the freedom to choose

Unique conditions in the Scandinavian countries give opportunities for creating access to outdoor recreation:

"The Freedom to Roam" or Right of Public Access is the ancient right for the general public to access most public and private land for recreation and exercise. This right is very closely linked to public responsibility for nature values and agricultural production in the landscape. As the project proceeded, it was clear that the autonomy or freedom to participate in the outdoor leisure activities of your own choice is perceived as being very important. To be able

to maintain a certain level of functional independence in your activities in life means having an identity and a human dignity (Mannell & Kleiber, 1997). The project manager made a strong recommendation that our upgraded outdoor facilities should have a toilet and a parking place for disabled persons situated as close as possible. Another important service enhancing independency is public transportation.

A pilot survey with 9 young persons with sight disorders detected the importance of creating places where it is natural to have social contexts. Why? Because the municipalities which joined the project are situated in a region dominated by small sized towns and countryside areas and in such municipalities it is very difficult to find friends in the same situation as yourself, especially if you are young. Job and study opportunities are primarily found in the larger cities.

The experiences made from asking people were supported by scientific publications (Hall, 2005). This made us to rethink the strategy of the project, using more effort on carefully select the sites where improvements should be done. The results are shown in Table 1, where a comparison is made to the scientific study of demand and constraints to outdoor recreation participation in Sweden (Romild et al., 2009). In this table it is shown that our sites are situated at places which are also by the general public perceived as popular places. The only important exception is biking because the landscape in our region consists of low cliffs and hills.

## Results

The project will finalize in 2013 and the main outcome will be the internet data base "Tillgänglighetsdatabasen" including close to 70 accessible sites and the publication of an atlas on the sites, including descriptions of accessibility. The atlas will be published as a physical book, but also for downloading free of charge and as a Daisy book for people with sight disorders. The result is due to be published in the spring 2013.

## Lessons learnt

- A governance group and effective working groups should be set up and invited to regular meetings at Day one of the project.
- Managing 22 partners in two countries need the attention of a full time coordinator. The municipalities are too small to have enough expertise in the areas covered. Some of the problems included solving matters which involve land owners, construction permits, nature reserve regulations and internal misunderstandings.
- Internal Information and communication must be efficient.
- Quality matters are essential. Quick feedback of problems in the field should be assured to ensure that

Table I. Activity types chosen for access improvement works by the municipalities of the project “Outdoor Activities Accessible for All” in Swedish and Norwegian coast municipalities -in comparison to general popularity of outdoor activities in Sweden (Source: Romild et al. 2009)

	<b>% of planned sites (N=147)</b>	Participating at least one time last 12 months (ranking), % of respondents
Walking/trekking	25.9	92
Beach	18.4	73–80
Rest site	15.6	22–80
Grilling site	8.2	22
Fishing site	6.1	39
View site	4.8	38
Boat Landing-stage	4.1	36
Outdoor Learning site	2.7	38
Canoe Landing-stage	2.7	12
Bird watching site	2.7	38
Outdoor Historical museum	1.4	-
Horseback Riding Site	1.4	7
Historical site	1.4	-
Sculpture park	1.4	-
Botanical garden	0.7	-
Geological site	0.7	-
Biking road	0.7	73
Beach-volley ground	0.7	-
Sauna	0.7	-

maintenance is up to date. In this case the inventory system and the database of Tillgänglighetsdatabasen ([www.t-d.se](http://www.t-d.se)) is used.

- Financial issues and the dissemination of instructions to follow EU regulations are taken well care of within the municipality administration, where staff is professional and well trained.
- Maintenance issues for future continuity should be a part of the project result. Contacts with local target group associations and individuals should be kept during all stages of the project. This ensures that mistakes are corrected.

- Reporting should be regular and sufficient competence for analyzing results should be present. A broad competence of the project leader is crucial for a successful result
- The marketing of the sites should preferably be done by inviting individuals in the target groups to expert group meetings and workshops at an early stage. Specially adapted guided tours for different parts of the target group should be arranged, according to the demand from target group representatives.
- Future needs – well this is easily analyzed: Society needs more of the same.

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# Making web-based maps accessible for elderly people: Development of an improved information source for recreational visits in natural areas

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Current demographic changes which are characterized by a steadily increasing number of elderly people call for changes in natural areas visitor management. Due to specific age-related physical deficits and changes such as visual impairment or walking disabilities these visitors demand for specific infrastructure. However, the availability of these elements must be communicated to the elderly. This asks for particular designed information media. Here web maps runnable on desktop and mobile devices can be the tools of choice. Based on research conducted within the project *AccessibleMap* this paper aims to offer suggestions for accessible web maps, providing elderly people with relevant information when visiting natural areas.

## Introduction

Several studies conducted over the past few years show that visitor management in natural areas is confronted by increasing numbers of elderly visitors, who can be divided into different subgroups such as the “new” elderly (best ager; aged 55-65) and the older people (seniors; aged 65plus) (Trachsel & Backhaus, 2011). Due to better health conditions and fitness, the elderly are more active than a decade before. Nevertheless, because of age-related deficits and changes this visitor group not only asks for particular infrastructure, services and facilities (Pfeifer et al. 2009), but also requires information about the availability of these elements.

Today, dynamic and interactive web maps (e.g. GoogleMaps), runnable on desktop and mobile devices play a significant role in getting information. To a growing extent, natural areas use these tools to inform and guide their visitors. Advantages of using web maps for visitor information are numerous: timeliness of information, well-known benefits of cartographic communication, relevance for navigation, etc. (Jekel & Jekel, 2010). Accordingly, web maps can be seen as a relevant information source for the elderly as well. However, there still exists a gap on the specific requirements of this visitor group with regard to appropriate web maps:

- Which content is asked for by this visitor group to support, i.e. encourage natural area visitation?
- How to design web maps (i.e. map layout) appropriate for elderly people (e.g. paying attention to age-related visual impairment)?

The main objective of the *AccessibleMap* project (funded by the Austrian Federal Ministry of Transport, Innovation & Technology/ Benefit program; [www.accessiblemap.at](http://www.accessiblemap.at)) is to develop and improve usage of web maps according to the requirements of the elderly and particularly visually im-

paired people. It aims at designing and implementing an accessible map application (prototype development). The *AccessibleMap* project is based on the research results of the *AmauroMap* project (Wasserburger & Neuschmid, 2010). Specific research findings of the *AccessibleMap* project can thus be used to implement accessible web maps, proving elderly people with relevant information when visiting natural areas.

## Methods

In order to specify user requirements of the elderly within the *AccessibleMap* project (focusing on users with visual impairment) a user survey was conducted in 2011. This questionnaire was developed using the internet survey tool SurveyMonkey and consists of 55 questions referring to:

- Demographic issues
- Characterization of internet and web map use behavior
- User needs on map content
- User preferences on user interface design and map design.

The questionnaire was spread across Austria and Germany by Email, telephone and face-to-face propaganda. The data collected by the survey resulted in 158 valid responses. After pre-processing results, they were statistically analyzed, interpreted and enriched with findings of a comprehensive literature review.

## Recreational visits in natural areas: How to make web maps accessible?

Generally, web maps being accessible and usable for the elderly have to be designed as simple as possible. This encompasses the visual design as well number and structuring of implemented functionalities. Only the most important and basic map operations such as zoom, pan, search, and identify features (incl. popup windows offering supplementary information) should be provided. With regard to these demands a number of common standards as well as Web-Accessibility standards and guidelines can be used. Standards (e.g. WCAG 2.0, ATAG 2.0, UAAG 2.0, ISO 28803, EN ISO 9241) can therefore support the design of an accessible web map application.

User interfaces of accessible applications should address the different human senses such as tactile, hearing and sight. This enables users to access and use information according to their personal preferences and capabilities. Thus an accessible web map should be designed as a multimodal interface and implemented as graphical, audio, and textual interface. To enable elderly to use computer applications



Table 1. Examples of map content items for elderly visitors

Category/ type	Characteristics/ aspects important to elderly visitors
<b>POIs (Points of Interest) such as picnic areas, nature attractions, viewpoints, wildlife observations points, parkings etc.</b>	<ul style="list-style-type: none"> <li>➤ Barrier-free access and usage</li> <li>➤ Provision of benches, resting places</li> <li>➤ Accessibility to transportation means (e.g. nearby)</li> <li>➤ Existence of guidance systems (e.g. signs, tactical signs)</li> <li>➤ Availability of toilets and/ or other services (restaurants)</li> </ul>
<b>Trails</b>	<ul style="list-style-type: none"> <li>➤ Length, height difference, inclination, material,</li> <li>➤ Provision of benches, resting places</li> <li>➤ Existence of barriers (e.g. steps)</li> <li>➤ Existence of guidance systems</li> <li>➤ Accessibility to transportation means (e.g. nearby)</li> <li>➤ Availability of toilets and/ or other services (restaurants)</li> </ul>
<b>Visitor centers</b>	<ul style="list-style-type: none"> <li>➤ Personal attendance</li> <li>➤ Barrier-free access/ entrance</li> <li>➤ Barrier-free design of presentation/ use</li> </ul>

and web map applications, assistive technology and visual aids (e.g. magnification software, Optical Character Recognition, Screen Reader, Voice Output) and textual, i.e. readable descriptions (with regard to the user interface and the map content) must be provided (Neuschmid et al., 2012).

In terms of an optimized map design for the elderly, particular attention should be paid to an optimized visual map design (referring principally to age-related visual deficits). This depends on the suitable configuration and combination of visual variables for presenting point, line and polygon features. User survey results point out that color contrast, color design, feature size, and feature labeling (font size) are of particular relevance to optimize web map design. Due to the wide range of personal preferences, provision of functionalities which allow user adjustment on contrast, symbol size, line width, color combination etc. can therefore be considered essential (Neuschmid et al., 2012).

Regarding the map content, information demand of the elderly is characterized by their particular recreational behavior, which in turn is depending on physical age-related

deficits and changes. Information is required on existing infrastructural supply, services and facilities, which is accessible and barrier-free. Table 1 shows a selection of specific information demanded by the elderly.

## Conclusion

The current process of demographic change asks for new and smart solutions even within the domain of recreation. One of the challenges is to provide suitable information material to the elderly communicating recreational infrastructure which meets their demands in terms of age-related physical deficits and changes. Here accessible web maps (specific map content, optimized map layout) are one essential information source. Implementing accessible web maps for natural areas contributes therefore towards delivering individual natural areas information for a wide range of users, including the elderly.

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# Managing Vatnajökull National Park

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Vatnajökull National Park is the largest and most recent national park in Iceland, established in June 2008. Its establishment marked a sea-change in nature conservation in Iceland in several important ways. First, partly because of its large size (ca. 13.200 km<sup>2</sup>), inhabitants of the communities that border on the park were given much more influence over the park's governance than has previously been the case. The park is thus divided into four semi-autonomous regions, each with its own regional council which is mainly comprised of local inhabitants (i.e. members of municipal councils and NGOs). The chairmen of the regional councils also have a seat on the park's Board of Directors. Second, the park seeks to reconcile nature conservation and traditional land use to a much greater extent than previous national parks in Iceland, it thus has a "tri-partite" classification with regard to IUCN protected area categories, including substantial portions that are classified as a Category VI PA. Traditional landuse (including hunting, fishing and sheep grazing) is allowed – if kept within sustainable limits – in most parts of the park and some areas within the park remain in private ownership. Third, the park's recently accepted Management Plan (2011) places considerable emphasis on the park's role in sustainable rural development, i.e. the park's "third role" in addition to the traditional roles of protecting nature and facilitating outdoor recreation of tourists.

The process of establishing Vatnajökull National Park took more than a decade from the time the first ideas about the park were put forth in the Icelandic Parliament until the final acceptance of the park's management plan. During this period the establishment of the park was discussed by four successive committees which each put forth different ideas about e.g. the park's boundaries, management goals and governance structure. The recommendations of the last committee in this line, mainly comprised of representatives of communities adjacent to the proposed borders of the national park, were then by and large adopted by the Ministry of Environment and became the foundation of Act nr. 60/2007 on Vatnajökull National Park. These recommendations placed considerable emphasis on the park's potential role in greatly increasing visitation of foreign tourists to Iceland, leading to economic benefits both for its neighboring communities and for the nation as a whole. The recommendations also briefly mentioned the possibility that such increased economic benefits from tourism in the national park could in turn reinvigorate development in the surrounding rural communities, which had been suffering from stagnation and depopulation for several decades. The latter considerations were not reflected in the abovementioned Act but did, however, find their way into the Regulation on the national park, issued in June 2008.

Regulation nr. 608/2008 on Vatnajökull National Park stipulated, amongst other things, the parameters of how the park's Management Plan should be drawn up. The

Management Plan should thus be in accordance with international agreements on nature conservation and follow the established guidelines and classifications of international organizations such as IUCN. The Management Plan should furthermore be drawn up in consultation with land owners, local authorities and other relevant stakeholders. Each regional council was given the responsibility of creating a draft Management Plan for their region, these were then to be combined into one document for the whole park by the Board of Directors. The total timeframe allowed for this process was 2 years, which was way too short given the both the size and novelty of the task (at least in Icelandic circumstances) and the complexities involved, e.g. in terms of coordination. During the final stages of drawing up the Management Plan, attempts were also made to define the "third role" of the national park, i.e. its relationship to sustainable rural development.

After completion in September 2009, the Management Plan was submitted to open public consultation, as part of a Strategic Environmental Assessment process. The plan received considerable criticism, mainly from various recreational associations whose primary complaints concerned issues of road accessibility in the highland wilderness areas in the middle of the park, as well as limits set on the hunting period of reindeer and pink-footed geese in its Eastern region. Some criticisms were also received from nature conservationists, e.g. concerning the use of multiple IUCN protected area categories in the park. The Management Plan was finally approved, with changes, by the Minister of the Environment in February 2010. The following summer, large-scale demonstrations were staged by recreationist groups (mainly large SUV owners) protesting the closing of a number of jeep tracks in the Central Highland. Attempts have since been made to reach a consensus about the most highly debated routes but the outcome of these is still not known.

In addition to these problems facing the park in relation to its Management Plan, there have also been a number of external factors that have influenced its development, including the financial crisis in 2009 which amongst other things led to major cuts in the park's budget, which in turn have led to delayed (and/or reduced) infra-structure build-up. These have also had negative effects on the park's capacity to develop "third role" initiatives, e.g. in cooperation with local tourism businesses, which to date remain largely unexplored.

The Hornafjörður Regional Research Centre launched a research program in early 2007, shortly after the establishment of the national park had been decided, which purpose was to monitor the effects of the park on its local communities and also to investigate potential changes in visitors' attitudes and behaviors over time. In 2007, interviews were conducted with local stakeholders in different regions, focusing on their views and expectations towards the park,

and in 2008 a fairly large-scale questionnaire was distributed among the park's visitors. In 2008-2009, attempts were also made to design a framework for the evaluation of the park's socio-economic effects on its neighboring communities. These studies were intended to be repeated at 3-5 year intervals but this has not yet proved possible because of much reduced research funding. Important baseline data was, however, collected that will hopefully be augmented in the near future.

# Management of visitors in Plitvice Lakes National Park (Croatia) – present situation, nature conservation, challenges

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Plitvice Lakes National Park is one of the oldest and best known protected areas in Croatia established in 1949 as an area of the exceptional natural beauty.

The international significance of Plitvice Lakes National Park as a unique natural location at the global level was acknowledged in 1979, when United Nations entered it on UNESCO World Heritage List in 1979.

The Plitvice Lakes are a specific geological and hydrological karst phenomenon. Unique continuous process of tufa deposition, where certain plants (algae and mosses play a significant role) cause the barriers between the lakes to grow and form new waterfalls, curtains and cascades, thus maintaining the form and existence of the Plitvice Lakes.

Placed within the forest karst landscape, the sixteen larger named and smaller lakes are interconnected with foaming cascades and waterfalls. The landscape value of this protected area is formed by an entire complex of natural elements, including forests, waters and meadows.

Forests, which take the biggest part of Park and grassland ecosystems, are abundant in biodiversity. There are 1,448 plant taxa have been recorded and many of them endemic, 50 of them represent various orchid species. Fauna of the Park is also rich and diverse. The forests are habitat of more than 50 mammals including large European carnivores – bear, wolf and lynx. Water areas of the Park as basic phenomena zone where tufa (kind of rock) is in progressive creation are the most visited but they take less than 1 % of Parks total area of 29,685.15 km<sup>2</sup>.

Developed infrastructure of current visitor system includes hiking trails, wooden bridges over lakes and tufa barriers which enclose water to the visitors. Electro boats on Kozjak Lake drive since 1978. The most of the hiking trails are constructed at the end of nineteenth and beginning of last century completed during the 1930s with some enlargements in 1960s, and some very new, established in 2010.

The area was affected with the war in period 1991–1995. After war ends the natural beauties of Plitvice Lakes attracted huge number of visitors with growing tendency. In 2011 the Park was visited with 1,083,451 visitors. The tourists of this area could be divided into group and individual visitors. The most of visitors come to Park during summer season (July, August; up to 10,000 people per day) from the costal part of Croatia while the number of tourist groups is largest in the pre- and post- tourist season during the spring and autumn. All of them visit to the lake's zone as a rule. Between 10:00 a.m. and noon is the most frequent arrival time in the Park. In 2007 the new Management Plan was finished and foresee Carrying capacity study. The Management Plan calls for the development of a Study to determine the burden and estimate the carrying capacity, with assessment of the daily and annual carrying capacity of this area.

Visitors are received in Plitvice Lakes NP at two official entrances: Entrances 1 and 2 and the auxiliary entrance "Flora". The all information about the Park area could be received here. Information points can also be found at Kozjačka Draga, Labudovac and dock P1 on Lake Kozjak. Visitors can also obtain additional information at the hotel reception desks, from the scenic tour-trains staff and information assistants at the parking lots.

According to the Physical Plan of 1986, a total annual number of 1,657,000 was foreseen. There are seven different sight-seeing programs formulated on the basis of time schedule criteria for the visit to different areas, depending on which entrance is the starting point of the tour. These programs also include the use of the scenic train and the electric boat on Lake Kozjak.

Park visitors can move around marked trails in the Park individually and in groups, either by hiking or by a combination of transport by tour-trains, tour-boats and row boats on Kozjak Lake.

The new Physical Plan suggests a relocation of the official entrances to peripheral areas.

Carrying capacity studies of more recent date do not exist.

Besides Entrances 1 and 2 and the auxiliary Entrance Flora, information points are on following locations: Kozjačka draga, Labudovac and Dock P1 on Lake Kozjak.

Visitors can also obtain information at the reception desks of the hotels and from staff members working on the scenic trains and electric tour-boats.

The number of people visiting this national park is continually increasing but it will be necessary to develop management based on the principles of sustainable growth and an acceptable eco-tourism concept.

As the one of the most visited tourist destinations in Croatia the popularity of Plitvice Lakes NP has long since exceeded Croatian borders which is reflected in the nationality structure of Park visitors in which are predominant foreign visitors. The Lakes are known and very popular among the visitors in surrounding countries and Middle Europe.

This protected area is so-called "must go" destination, meaning a location that must be visited, which was reflected in the number of visitors during the 1996–2011 period.

The Management Plan foresees the determination of a carrying capacity study for the lakes visitor system, the wider Park territory and determination and implementation of daily visitor limits. The zone of the lakes is open to visitors is a recreation and tourism infrastructure zone. It is the most attractive area in Plitvice Lakes National Park. The largest number of visitors is concentrated in this zone.

In the interest of preserving the ecological balance and



Figure 1. Veliki slap – The highest waterfall in Croatia, with Sastavci and the Lower Plitvice Lakes is one of the most visited locations in Plitvice Lakes National Park

avoiding possible negative consequences to the sensitive ecosystem of the lakes and the natural process of tufa formation, and to ensure quality tourist experiences in this part of Park for each visitor, it is necessary to compile a study on the carrying capacity of the lake system for visitors which will define the optimum number of visitors in this zone

These activities require the engagement of a multidisci-

plinary team of experts and use of all previous data on such research. The challenge is how to establish parameters for this and to be as more objective as it possible in nature conservation and impact of visitors. The spatial distribution of visitors exerts a great impact on the state of environment and on the quality of the manner in which tourists experience this area.

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# Let's Count with Geocaching

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Geocaching appeared only some 12 years ago but has now developed into a very popular outdoor activity in many countries. It is a more “sophisticated” form of traditional tourism, where a geocacher visits interesting places, learns something, finds a hidden treasure (a geocache), and logs his visit into a paper logbook in the cache as well as into an internet logbook. Various cache types, sizes, degrees of difficulty, and other attributes give the geocacher opportunities to make choices and go places that align with personal interest and ability. Cache listings contain information about the place and sometimes include interesting information that may not be found elsewhere.

Despite its origin in California, geocaching is today most intensive in Monaco and the Vatican (when measured by cache density). From the states that are comparable in size, the highest cache density was detected in Luxembourg (0,855 per sq. km) and Germany (0,712). Geocaching is very popular in other European countries, too: Denmark (0,546), United Kingdom (0,507), the Netherlands (0,450), Belgium (0,432), Switzerland (0,411), Czechia (0,381) and Austria (0,305). Although there are countries without any caches, we can say that geocaching has spread all around the world. Nevertheless, in some countries, geocaching is performed mainly by tourists (e. g. in Croatia).

Intensity of geocaching is still increasing, thus the activity has an exponential trend. This trend can be easily observed on the internet by number of caches created or by cache log numbers. The chart below shows the intensity in Czechia of the numbers of newly created caches between 2001 and 2011.

In the countries mentioned above, the geocacher community represents approx. 0.5–1 % of the total population. However it is very difficult to get useful data on geocachers (number of geocachers per state, their activity, etc.) from the web.

Most of the caches are placed in cities because a cache should be placed near the owner's home in order to maintain it. But traditional tourist points of interest host caches, too. Nature, and especially in protected areas, is one of the main targets to place a geocache. Because sensitive natural features can be impacted by visitation through the creation of caches, managers of protected areas need to be aware of newly established cache sites. Communication between managers and geocachers is necessary to prevent or solve conflicts and should be used instead of restrictions. According to geocaching rules, every new cache should be discussed by its owner with the landowner and land manager. So far, such cooperation is not a custom among cachers, at least in Europe. Problematic caches can be altered through a message to the owner (adjustments can be done by changing attributes, listing, hint, placement; and in very specific cases, removal). If the cache owner does not react properly, such caches can be archived by volunteer reviewers (this means that the cache listing exists and can be found by its

code, but is not published among available caches). Reviewer permission is also essential for publication of every new cache.

Geocaching can effectively serve for natural heritage interpretation through cache listings or geocoins. This is similar to what protected areas managers do, but geocaching costs significantly less than their usual measures (information boards, leaflets, information centres, etc.). Cache listings can be compared to information boards or to educational paths. It is well known that young people do not read interpretive signs. Geocaching, however, is popular mostly among such youngsters and therefore may be a way to spread information among them. In listings, cachers often find information about the place (what could be interesting here) including flora and fauna, geology (especially in earthcaches), architecture, etc. On the other hand, many geocachers are interested only in getting “a point” for finding a cache and do ignore the listing. This is typical for “traditional-type” caches that are found by coordinates and require no further description. Interpretation of an area could also be done also through geocoins. Geocoins are mostly made of metal and can carry any graphic and a short text (name, sentence, URL address...). Geocoins, as well as travel bugs, are marked with a unique code. Their aim is to travel from one cache to another cache and their journey is logged through its code and their total travel distance is measured and visualised on a map. These data can be observed on a web listing of each trackable item.

Because geocaching is a volunteer activity, it should not be funded by state or companies. The Geocaching community is quite sensitive to any marks of profit in cache listings (as the world nowadays is crowded by advertisement), but the community is fond of various stuff dealing with geocaching (cloths, outdoor equipment, stickers, etc.).

In the Czech Republic, experience offers examples of good and bad practices, which can help inspire other cache destinations. Generally, for protected area managers it is important to know about all caches in maintained areas and to be in contact with the local reviewer.

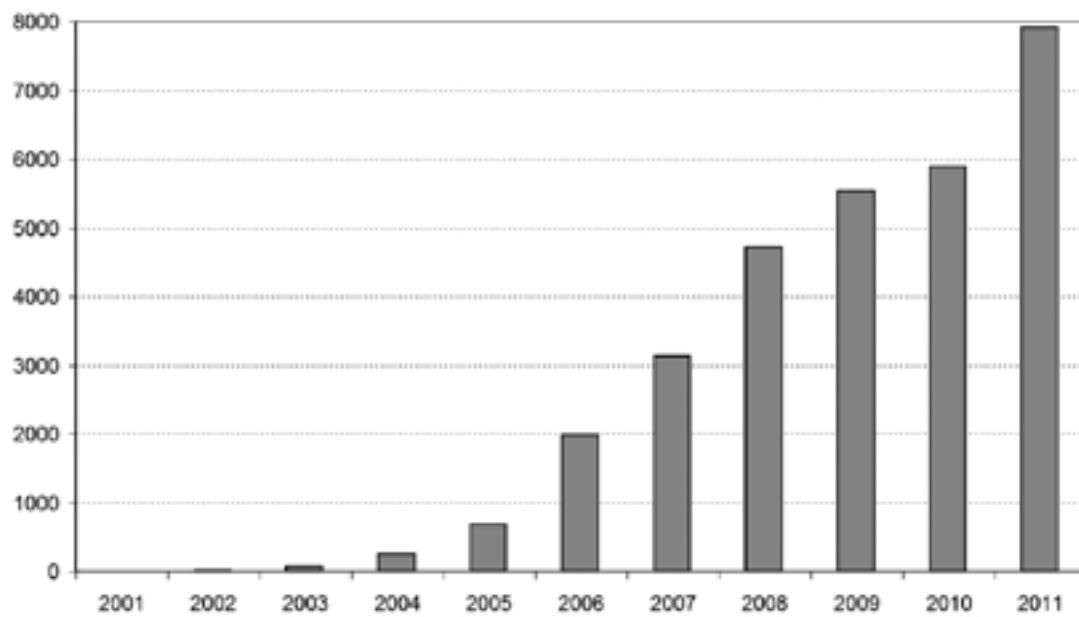


Figure 1. Numbers of newly created caches in the Czech Republic by year

# The roles of hardening and separating sites and planting areas in enhancing the carrying capacity in neighborhood parks

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In China, especially in big cities like Shanghai, there are large urban populations and high residential density but not many urban parks. Urban parks are bearing enormous pressure to carry a great deal of outdoor recreation activities for large numbers of residents. Consequently, improving the carrying capacity of these urban parks is of great concern for park planners and designers. Neighborhood parks are small urban park areas near residential communities and are primarily responsible for offering opportunities for outdoor activities to neighboring residents.

During five years of observation at the Neighborhood park-Songhe in Shanghai, we found that hardening recreation site (making the site “harder” with pavement) as well as separating the recreation site from the planting area can enhance the carrying capacity of the park.

Songhe Park is located in the Yangpu District of Shanghai, which is a very dense residential area. The park is small (about 1.3ha), but there are always a lot of people at the park, and the park appears to be frequently by elders in the community. Based on long-term observations, we found that the number of visitors in this park is always in the hundreds (instantaneous amount), and even reaches 700–800 persons during the peak periods.

“The Code for Design of Parks(CJJ 48–92)” in China provides that the per capita area in the small urban park should not be less than 30 m<sup>2</sup> per person. Generally, if the parameter is below this standard, the ecological environment of the park will not be good. However, in Songhe park, the per capita area during peak periods is about 17.5 m<sup>2</sup> per person (1.3ha/800person=17.5m<sup>2</sup>/person). The park visitation exceeds the standard which the Code provided by nearly double. Despite such visitation, the park’s ecological condition has not been impaired.

In Songhe Park almost all of the recreational areas and roads are hardened. Some sites were equipped with intensive recreational facilities. Most of the roads are wide and Chairs are provided for visitors to sit and chat. Most vegetation zones are separated from the recreation areas, and visitors are not allowed to enter the vegetation zones. The park contains three grassy areas (or lawns) that visitors are allowed to come in(see Figure 1). However, these areas are sometimes closed to visitors so they can regenerate. These three lawn areas are the only relatively large open spaces in the park where visitors can carry out sports such as badminton. The other main recreational activities in this park are: walking, bird-watching, chatting, jogging, fitness with equipment, playing chess, singing, and dancing.

Because of the hardening of recreational sites and the separation of the vegetation zones from the recreation areas, the park’s ecological condition is good, despite the

large number of daily visitors. This suggests that the carrying capacity of the park may be enhanced by the hardening of recreational sites and the separation of vegetation zones from recreation areas.

Meanwhile, we found more than 60% of the park’s participants were the elderly (>55years) accompanied by children (<14years) who were 30% of the population. The young and middle-aged visitors (14–55years) were less than 10%. Within this context, we wanted to better understand the recreational experience of park visitors through a survey.

We carried out a questionnaire survey of 186 respondents out of 200 questionnaires. The response rate is 93%. In order to understand the experiences of the young people, we encouraged the elderly to take home the questionnaires in this survey.

The results show that 34% of elderly responses report that they are “satisfied” with the park, while 52% rated the park as “acceptable” and 14% rated the park as “unacceptable”. In terms of the younger responses 7% reported that they were “satisfied” with the park, while 21% rated the park as “acceptable” and 72% rated the park as “unacceptable”. The first two evaluation items “satisfied” and “acceptable” means the visitors are willing to go to the park, the total ratio for the elderly is 34%+52%=86%, the young people is 7%+21%= 28%, so we can see that the current status of Songhe park is highly acceptable among old people, but unsatisfactory among young people.

The survey of the reasons leading to the above evaluation results showed that, the young people dislike the Songhe park because it has too many people, the facilities are too crowded, there are no large venues, and few private spaces; But the elderly inclined to accept this park because they more concerned about of the park : the opportunity of chat, the relaxation of the spirit, the convenience of fitness activities, proximity to their homes ,and the good environment condition.

The approach of hardening of recreational sites and separating the vegetation zones from the recreation areas has played an important role in enhancing the carrying capacity of Songhe Park. From our analysis of the recreational experience, we found this approach highly acceptable by elderly visitors, but generally not acceptable by younger visitors. In China, the proportion of elderly residents in urban communities continues to rise. Therefore, outdoor recreation care for the elderly should get increasing attentions in society. The way Songhe Park has enhanced the recreational carrying capacity of the park has important social significance for providing more outdoor recreation opportunities for elderly residents.



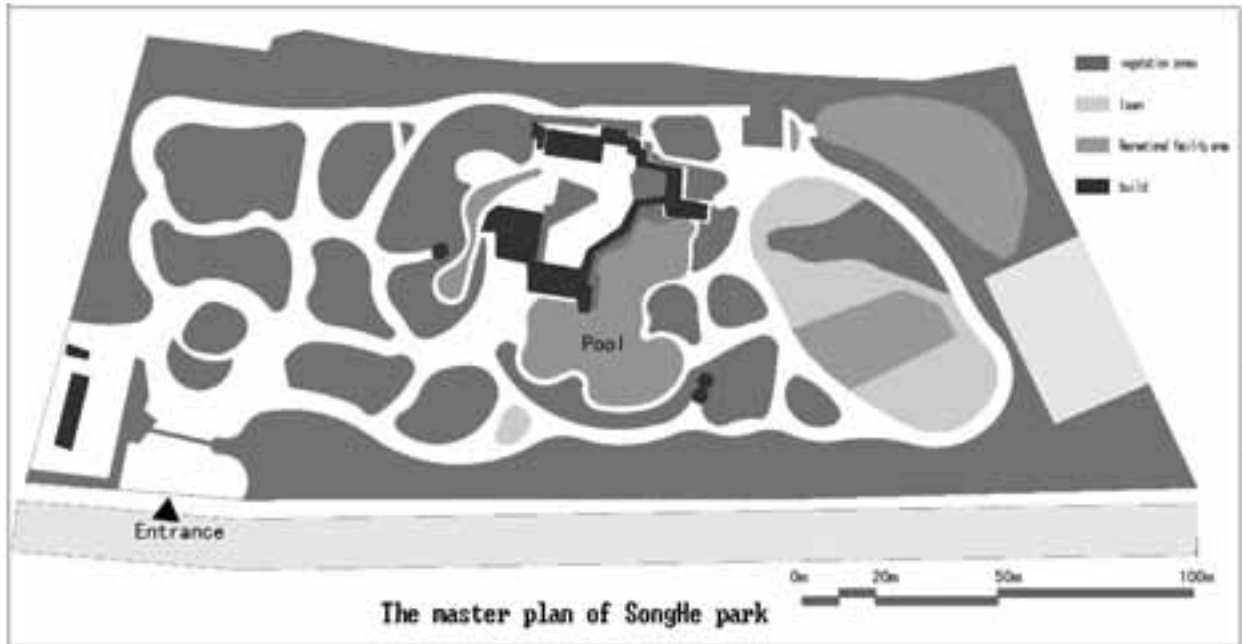


Figure 1. The map of SongHe park.

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# Managing outdoor recreation: Case studies in the national parks

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The popularity of outdoor recreation continues to grow worldwide. However, there is little systematic information on how to manage outdoor recreation in ways that protect park resources and the quality of the visitor experience. This paper describes development of classification systems of outdoor recreation-related problems and management strategies and practices. Management problems include impacts to park resources (soil, vegetation, water, air, wildlife, historical/cultural resources, soundscapes, night skies), impacts to the quality of the visitor experience (crowding, conflict, depreciative behavior), and impacts to park facilities (trails, campsites, attraction sites, roads/parking lots, and interpretive facilities/programs). Management strategies include limiting use, increasing the supply of recreation opportunities, reducing the impact of visitor use, and hardening park resources and the quality of the visitor experience. Management practices include information/education, rationing/allocation, rules/regulations, law enforcement, zoning, and facility development/site design/maintenance. These classification systems are then combined into a series of four matrices that can be used to help guide outdoor recreation management. One of the matrices is shown in Figure 1 as an example.

The paper uses a series of case studies drawn from the US National Park System to illustrate use of the management matrices. For example, one of the case studies addresses management of the Colorado River in Grand Canyon National Park. The Colorado River is the heart of Grand Canyon and offers visitors a world-class whitewater river trip. However, increasing use of the river was causing impacts to the limited number of campsites along the shore (Impacts to Campsites), many of the areas iconic side canyons and other attraction sites (Impacts to Attraction Sites), and some of the Canyon's archeological and historical sites (Impacts to Historical/Cultural Resources). The growing amount and diverse types of use were also causing crowding at campsites and on the river (Crowding) and conflict between motorized and nonmotorized boaters (Conflict). A new management plan is relying on the twin strategies of Limiting Use and Reducing the Impact of Use, and has implemented a coordinated suite of management practices, including spatial and temporal zoning of the river (Zoning), regulation of the number and type of boating trips (Rules and Regulations; Rationing/Allocation), ranger patrols to enforce regulations (Law Enforcement), a lottery system to allocate permits to noncommercial boaters (Rationing/Allocation), and an intensive program of public education (Information/Education).

The paper concludes with the following series of principles for managing parks and outdoor recreation that are drawn from the management matrices and case studies:

1. Parks and related outdoor recreation areas must be managed in ways that provide outdoor recreation opportunities but also protect park resources and the quality of the visitor experience.
2. Outdoor recreation management should be guided by a management-by-objectives framework.
3. Outdoor recreation management is an iterative, adaptive process.
4. Outdoor recreation should be managed within a three-fold framework of concerns: resources, experiences, and management.
5. The Recreation Opportunity Spectrum should be used to help ensure diversity in outdoor recreation opportunities.
6. Outdoor recreation can impact parks and related areas in many ways, including park resources, visitor experiences, and park facilities and services.
7. Outdoor recreation can be managed using four basic strategies.
8. Outdoor recreation can be managed using six basic categories of management practices.
9. Outdoor recreation management problems can be addressed by more than one management strategy or practice.
10. Outdoor recreation management strategies and practices can address multiple problems.
11. Outdoor recreation management practices can be used to advance more than one management strategy.
12. Outdoor recreation management strategies can be advanced by more than one management practice.
13. Where possible, a reinforcing program of outdoor recreation practices should be used.
14. Managers should think systematically, comprehensively, and creatively about the range of practices that might be used to manage outdoor recreation.
15. Outdoor recreation management practices should not be used simply because they are familiar or administratively expedient.
16. Potential unintended and undesirable consequences of outdoor recreation management practices should be identified and avoided.
17. Good information is needed to effectively manage outdoor recreation.
18. Management of outdoor recreation should be as informed as possible by understanding the cause of the impact or problem.
19. Outdoor recreation management decisions should be considered within the context of larger geographic scales.
20. Outdoor recreation management should focus on the impacts of recreation use, not use itself.

Management Practices	Problems															
Strategies Practices	Impacts to Resources								Impacts to Experience			Impacts to Facilities/Services				
Limit Use	Soil	Vegetation	Water	Wildlife	Air	Soundscapes	Night Sky	Historical/Cultural	Crowding	Conflict	Deprecatative Behavior	Attraction Sites	Trails	Campgrounds/Campsites	Roads/Parking	Interpretive Facilities/Programs
Information/Education	1	7	13	19	25	31	37	43	49	55	61	67	73	79	85	91
Rationing/Allocation	2	8	14	20	26	32	38	44	50	56	62	68	74	80	86	92
Rules/Regulations	3	9	15	21	27	33	39	45	51	57	63	69	75	81	87	93
Law Enforcement	4	10	16	22	28	34	40	46	52	58	64	70	76	82	88	94
Zoning	5	11	17	23	29	35	41	47	53	59	65	71	77	83	89	95
Facility Development/ Site Design/Maintenance	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96

Figure 1. Management matrix for the strategy of limiting use

21. Limiting use is generally a last outdoor recreation management option.
22. Limiting or rationing outdoor recreation use requires consideration of how limited opportunities for use will be allocated.
23. Indirect outdoor recreation management practices are generally preferred over direct management practices.
24. Intensive outdoor recreation use usually demands intensive management.
25. When and where warranted, outdoor recreation management should be designed to reach visitors before they arrive at parks and outdoor recreation areas.
26. The list of outdoor recreation activities that need management consideration continues to evolve and expand.
27. The list of park and outdoor recreation «resources» that need protection continues to evolve and expand.
28. Variations in outdoor recreation management practices continue to evolve and expand.
29. Outdoor recreation management can impact the quality of the visitor experience both positively and negatively.
30. Caution should be used when dispersing visitor use as an outdoor recreation management practice.
31. Partnerships between park and related outdoor recreation management agencies and other groups and entities can be helpful in managing outdoor recreation.
32. Responsibility for managing outdoor recreation should be jointly shared by managers and researchers.
33. Quality in outdoor recreation is most appropriately defined as the degree to which recreation opportunities meet the objectives for which they are designed.
34. Management of outdoor recreation should be conducted proactively, not reactively.
35. Managers must exercise their professional judgment in outdoor recreation management.
36. A strong program of management is vital to maintaining the quality of parks and outdoor recreation.

The material outlined in this paper has been developed into a book recently published by CAB International.

# Benchmarking for visitor management in parks

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## Managing visitors in parks

The future of parks is as much a political and social outcome as it is an ecological one. Political success, particularly where the resources are in public ownership, as is the case with many of the world's parks, depends on public support. Such support is increasingly based on being able to show value for money and the accrual of benefits to the public. Being able to report on the successes (and failures) of visitor management is part of this accountability.

## Benchmarking

Benchmarking – ‘a systematic procedure of comparative measurement with the objective to achieve continuous improvement’ (Wober, 2002, 2) – offers promise as a means of reporting on and comparing performance. It has been widely used by business but limited use has been made of it in tourism and virtually none in park management, with several notable exceptions. A recent review of visitor attractions identified benchmarking as a way of better understanding the factors contributing to the success or otherwise of management (Leask, 2010). Benchmarking within a particular park system has benefits in terms of difficult management decisions regarding resource allocation and to identify areas of poor and best practice so the latter can drive improvements in the former.

### Importance-performance analysis as a benchmarking tool

Importance-performance analysis, which measures and compares visitor's perceptions regarding the importance of, and satisfaction with, attributes such as the friendliness of staff, cleanliness of toilets, and usefulness of maps, can provide data for benchmarking. It provides a visual representation of how well an agency or company is meeting its customers' needs by placing attribute mean importance (performance) along the vertical (horizontal) axis of a two-dimensional plot (Fig. 1). Traditionally, cross-hairs are placed either at mid-scale or at grand means for importance and performance, creating four quadrants. For example, an attribute falling in the high importance and low performance quadrant suggests management action to ‘concentrate here’ (Tonge et al., 2011).

## Benchmarking for parks in practice

Few examples exist in the peer-reviewed literature of benchmarking across park systems. Wade and Eagles (2003) come the closest with their study of Tanzanian national parks where they segmented visitors into southern circuit users, northern circuit users and climbers and compared the IPA results. Three examples from current practice that have not (yet) made their way to the peer-reviewed literature follow.

*Yardstick Parkcheck* is a New Zealand based survey of vi-

sitors to parks managed by 16 councils in New Zealand and Australia. Visitors are asked to rate the importance and performance of specific park services and amenities (e.g., park gardens and trees, toilets) using a 5-point scale. The most recent report (Yardstick Board, 2010) illustrates the gaps between performance and importance for 10 attributes using bar graphs. For example, for cleanliness, all councils had a negative gap and for several councils this gap appeared relatively large. These graphs are easy to read and interpret.

The *United States Forest Service NVUM (National Visitor Use Monitoring) Program* provides results from visitor surveys across its national forests (USDA FS, 2012). Importance performance analyses cover 14 attributes including restroom cleanliness, employee helpfulness and signage adequacy. Results are provided for individual national forests, forest regions and the national system. Although tables provide results for each attribute in each park, benchmarking across parks is not explicitly performed.

Recently data collected from visitor surveys conducted in 13 parks and reserves in Western Australia has been used to undertake a *Statewide park benchmarking exercise*. The combined area of the parks managed by the WA Department of Environment and Conservation is 275,000 sq km (an area larger than Austria). Data have been collected for 23 attributes covering facilities provision and maintenance, information provision, staff performance, feelings of safety, and value for money. Several different approaches were investigated. Three are reported here, the first two relying on standard IPA and the third on a modified form – B-IPA.

1. Comparison of performance of parks across the system using standard IPA, with the cross hairs placed at the grand means for the parks. Two of the 13 parks appear in the ‘concentrate management attention’ quadrant, one a remote, but increasingly busy park and the other a peri-urban park with a long history of disruptive visitors in large numbers over public holidays (Karijini National Park and Land-Poole Reserve respectively).
2. Comparison of the performance of attributes across the system using standard IPA, with the cross hairs placed at the grand means for all the attributes. Usefulness of visitor guides was in the ‘concentrate management attention here’ quadrant and friendly, responsive staff was in the ‘overkill’ quadrant. This is similar to other analyses in the literature where data on attributes are aggregated for all parks in the system. It suffers from potential bias through benchmarking attributes to other attributes.
3. Modified approach called B-IPA (Benchmarking IPA) where the importance and performance of individual attributes are compared with the means of that attribute for all parks in the system. Such an

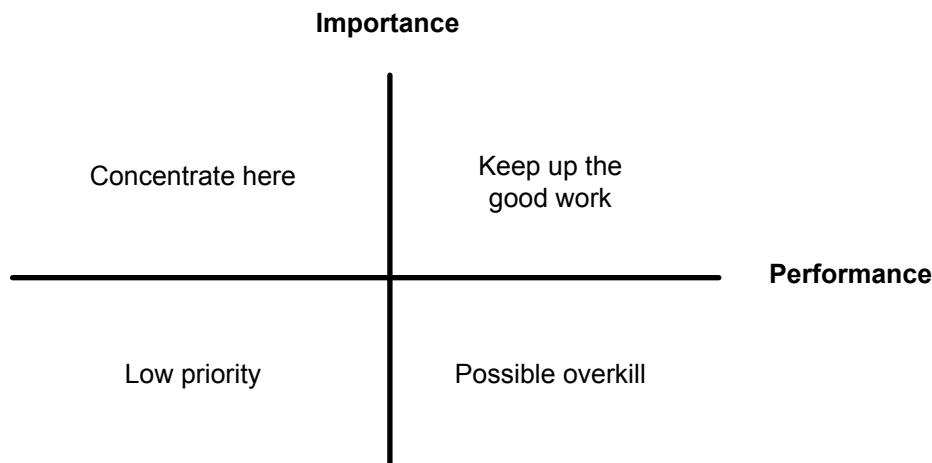


Figure 1. Importance-performance grid (Source: Tonge et al., 2011)

analysis allows direct benchmarking of an attribute with itself across the whole system. For example, B-IPA in the WA study suggested that at Karijini, road signs, road condition and maps and guides required attention relative to the performance of these attributes across the whole park system.

### Benchmarking issues and opportunities

These examples provide a promising basis for further developing benchmarking. Future issues include who to benchmark against and the ongoing issue of achieving standardization (or even consistency) in survey questions asked of visitors. A promising opportunity is to further develop and apply B-IPA given the important insights it provides for managers in allocating resources across a park system, through identifying poorly and highly performing attributes at one park relative to other parks.

### Acknowledgments

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# A place-based approach to building partnerships with recreational resource users

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## Introduction

As the largest land-based national park in Taiwan, Yushan National Park encompasses a highly mountainous landscape of 105,490 hectares in size. Mt. Jade Main Peak, which is 3,952 meters above sea level, is one of the most significant park features and represents the highest mountain in the nation and Northeast Asia. Every year about 35,000 hikers visit the Main Peak and this accounts for 77% of annual visits to the park's ecologically sensitive areas. Management issues have arisen due to concerns about recreational impacts on the fragile alpine ecosystems found on segments of the most popular trail leading to the Main Peak and potential conflicts among recreational users of the area. Our study examined three stakeholder groups involved in the use of hiking trails located within the ecologically sensitive areas of Yushan National Park. The purpose was to gain a better understanding of the values, beliefs and interests that each group ascribed to Yushan, and draw implications for developing partnerships between these groups and the park service.

## Literature review

A place represents more than a geographic location. It is also a socially constructed entity imbued with plural meanings (Stokowski, 2002; Williams & Patterson, 2007). From a social representation approach, reality is reconstructed and represented by individuals and thus becomes integrated into their value system (Abric, 2001). The processes of representation allow individuals to incorporate the objective characteristics of an entity, their previous experiences arising from interacting with the entity, and their belief and value systems into the production of a representation. Through these processes, plural representations of the same social object are created by persons varied in their social, historical, cultural, and personal connections with the object, that, in turn, guide their orientation toward it (Howarth, 2006). While most national parks were established with two seemingly clear goals, conservation and public enjoyment, balancing between these goals has proven to be challenging because different stakeholders represent national parks differently. These representations may guide their behaviors in the parks and responses to park related issues (e.g., resource uses, collaborative management), and, therefore, facilitate or impede sustainable park management.

## Methods

Informants were recruited based on their experience use history associated with Yushan National Park and motivations behind their visits, two factors contributing to how individuals view their relationships with recreational places (Hammit, Backlund, & Bixler, 2004). Forty-two

study participants were recruited through purposive and convenience sampling, and categorized into three groups. The first group comprised ten less experienced hikers who visited the ecologically sensitive areas within the park primarily for leisure and recreation, and were less committed to mountaineering. The second group consisted of sixteen experienced hikers who belonged to various non-profit mountaineering clubs, had visited the area at least numerous times for recreation, guiding tours, or mountaineering training, and were highly committed to mountaineering. Sixteen professional hikers who had frequented the area primarily due to their role as a tour guide or porter were highly involved in mountaineering, and lived entirely or partially on the services they provided for various non-profit or for-profit mountaineering entities were included in the third group. Semi-structured interviews were conducted to prompt informants to provide detailed accounts of the meaning they ascribed to Yushan National Park.

## Results

Three of the most recurrent themes from the interviews were Yushan National Park as (i) a place of significant environmental features, (ii) a place of easy access, and (iii) a national park managed for conservation and public enjoyment. The topographic feature of the Main Peak as the highest mountain in the nation and Northeast Asia was prominent among inexperienced hikers when describing the meaning of Yushan. Frequently, this feature of the Main Peak was expressed as representing the national identity of Taiwan and had played a major role in motivating inexperienced hikers' visit to the area. Ascending the Main Peak marked a significant milestone in the life of many informants in this group. Although this representation of Yushan was also endorsed by experienced and professional hikers, a broader array of features (e.g., ecological, geological, geographic, meteorological) that characterized various locations and phenomena within the park was also identified by these two groups.

The major differences between the hiker groups as well as the major differences between these groups and the park service rested in the remaining two themes. Well-maintained hiking trails, especially the most popular trail leading to the Main Peak that facilitated easy access to the area were appreciated by the most inexperienced hikers. The infrastructure installed by the park service to improve access and ensure hiker safety was, however, regarded by many experienced and some professional hikers to be in conflict with their ideal image of mountains as a setting to escape to wilderness and confront challenges. Moreover, easy access and the increased availability of commercial entities that provided guiding services and logistic supplies had signifi-

cantly increased the number of hikers and tour guides who had no or insufficient mountaineering training or did not acquire mountaineering ethics. This growing phenomenon was contradictory to what was conceived by many experienced and some professional hikers as mountaineering that required a certain level of skill and knowledge and respectful attitudes toward mountains. Meanwhile, this issue was less problematic for many professional hikers who suggested that commercial mountaineering services provided a mechanism to ensure inexperienced hikers' safety and better regulate their environmental impacts.

Yushan as a government managed place for conservation and recreation has a representation agreed upon by most of our informants. However, park management was viewed

by many experienced and some professional hikers as restricting public access and hindering hikers from expressing their aspiration for their attachment to mountains. This is because of implementation of a fixed daily entry quota to protect ecological and recreational values.

Stakeholders' representations of Yushan are incompatible with the management objectives of the park service can lead to uncooperative attitudes and behaviours toward park regulations. Mechanisms focusing on negotiating and reconciling differences in stakeholder representations and reinforcing their shared values will be needed for mutually trusting and collaborative relationships to be cultivated.

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# Protecting soundscapes in U.S. national parks: Developing visitor simulation and noise exposure models

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## Introduction

The majority of visitors consider opportunities to experience natural sounds as an important reason for protecting and visiting national parks, and many retreat to parks to experience the sounds of nature and natural quiet. Yet anthropogenic noise in and around these areas can mask natural sounds and negatively affect visitor experiences. Fortunately, policies and programs have been established to better protect these resources and social conditions, and specify that parks should integrate monitoring and planning efforts to protect soundscapes. For example, the National Park Service Natural Sounds and Night Skies Division (NSNSD), which is charged with protecting soundscapes, strives to improve resource and social monitoring and planning within parks. Collaborative efforts between the NSNSD, other federal agencies, research institutions like Colorado State University and the University of Vermont, and consulting firms such as the Resource Systems Group Inc. have fostered research initiatives that have advanced understanding of soundscape management in parks. The results of these efforts have been integrated into management processes, enabling managers to better monitor and manage acoustic resource and social conditions. This abstract provides a brief review of significant lessons-learned in the study of social aspects of sound management in parks.

## *Informing soundscape indicators and standards*

The cyclical process by which park managers access and manage the protection of acoustic resources and related social conditions, involves establishing soundscape indicators and standards of quality. Generally, this development requires that descriptive (unbiased data) and evaluative (subjective measures) components be addressed, so that management objectives (desired conditions) and ensuing indicators and standards of quality can be established (Manning, 2007). Once soundscape indicators and standards are established, they can then be monitored, and if standards are reached or exceeded, management actions can be taken.

## Case Studies

### *Establishing indicators and standards, role of motivations and education*

Through research at Muir Woods National Monument (Pilcher et al., 2009; Marin et al., 2011; Stack et al., 2011), Yosemite, Sequoia and Kings Canyon (Newman, et al., In Review), and Rocky Mountain National Parks (Park, et al., 2010) effective methods of determining potential social soundscape indicators and standards have been developed.

Furthermore, the results of research to inform these indicators and standards have discovered the role of visitor motivation, and effect of educational information in altering behaviors, perceptions and evaluations of park soundscapes. For example, visitor listening exercises followed by evaluations of sounds heard, can lead to viable social soundscape indicators. Additionally, audio recording evaluations can be used to determine acceptable and unacceptable levels of human-caused sounds such as voices, vehicles and aircraft, which are typically found to be annoying in park settings. Visitors that are highly motivated to hear natural sounds have been found to be less accepting of human-caused noise (Marin, et al., 2011). However, research suggests that educational messaging can decrease human-caused noise, such as loud voices (Pilcher et al., 2009, Stack et al., 2011), and alter visitor perceptions, expectations and normative evaluations of inevitable sounds such as those associated with aircraft overflights (Newman, et al., In Review).

### *Simulation and noise exposure modeling*

In the popular areas surrounding Bear Lake in Rocky Mountain National Park and Tuolumne Meadows in Yosemite National Park, a systematic research approach was taken in order to produce predictive, time-lapsed visitor density and soundscape modeling to inform management actions. In the Bear Lake corridor, data was gathered to quantify and model the effects of shuttle bus and private vehicle noise on backcountry-users. This was accomplished by collecting traffic volume, sound level data, visitor hiking routes, and trailhead visitation monitored through GPS tracking and trail counters. These methods provided input for modeling outputs that informed visitor use patterns and estimated the potential condition of soundscape indicators. Results indicated that in order for visitors to reach natural quiet, they would have to walk over half a mile; on average, for approximately 36% of visitors, their total hiking experience was spent hearing vehicle noise (Park et al., 2010).

In Yosemite National Park, vehicle noise was measured along with topography and visitor use patterns within the Tuolumne Meadows area. Results of the exposure modeling suggest almost all hikers in the area reach locations of the park exposed to roadway noise levels below 35 dB, and nearly half reach areas below 25 dB at some point during their hikes, suggesting that many visitors experience sustained periods of “unimpaired” exposure to natural sounds while hiking there (Newman, et al., In Review). Together, understanding visitor motivations, the capabilities of educational messaging, and systematic simulation modeling at these parks have enabled managers to see current trends and



impacts related to visitor use and experience that may be affected by noise, and predict potential impacts as they plan for the future.

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# Fifty years of experiential knowledge: Using oral history to understand wilderness management in Sequoia-Kings Canyon National Parks, USA

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## Introduction

Experiential knowledge is increasingly recognized as an important source of information about ecological change that can be used to monitor social-ecological systems. This presentation describes the results of a study to document the perceptions of changing conditions, use, and management of wilderness areas within Sequoia and Kings Canyon National Parks as perceived by long-time visitors, employees, and commercial operators. After nearly 50 years of active management by a cadre of seasonal backcountry rangers and other park staff members (e.g., trail crews, research scientists), it is important and worthwhile to attempt to collect and archive their experiential knowledge and reflections before it is lost. In particular managers with several decades of experience, who have been involved in the Sequoia and Kings Canyon wilderness program over multiple decades, can provide insights on the changing use, conditions, and effectiveness of management effort over time. Likewise, there are some in the user community including backcountry outfitters, private horse packers, and hikers who have many years of experience. The goal of study was to capture and document that experiential knowledge for both general historical purposes and to provide historical insight and context to the wilderness management planning process.

Sequoia and Kings Canyon National Parks are adjoining parks that are administered as a single unit (SEKI) located in the southern Sierra Nevada range in California. The two parks cover 351,854 hectares (865,952 acres), with 93% (327,225 hectares) designated wilderness. SEKI encompasses a wide variety of ecosystems – oak woodlands, stands of giant sequoias, mixed coniferous forests, and high alpine meadows – and include areas that range from 1,700 to over 14,500 feet (518 to 4420 meters) in elevation. The two parks are within a half-day drive of several major metropolitan areas, such as Los Angeles, Reno, Las Vegas, and San Francisco. The wilderness includes one hundred miles of both the John Muir Trail and the Pacific Crest Trail making the area a popular wilderness destination. In all, SEKI contains over 700 miles of maintained trails, as well as abundant opportunities for off-trail travel. Park rangers typically staff fifteen permanent/semi-permanent ranger stations located within the wilderness between June and October, and they often return to these positions for many years or decades. In 2011, eight of the 11 wilderness rangers had been working in the backcountry for 10 or more years. Three of those eight had over 30 years of experience in SEKI.

This study collected 23 oral histories from park employees (managers/rangers), private users (stock/hikers), and commercial users (stock/non-stock) to document their experiential knowledge of wilderness management and the

changes they have witnessed to wilderness conditions and uses in SEKI. The basic approach to the interviews was to ask respondents to reflect on their earliest experiences of the wilderness and then to discuss changes they have witnessed over time with respect to the basic conditions in the wilderness, the types and patterns of use and user characteristics, and management practices. With respect the latter an attempt was made to get respondents to reflect on (1) how changes in wilderness character and conditions were influenced by ranger practices and management level decisions and (2) how key management decisions were made, how they were implemented, and what resulted from these efforts. The interviews were conducted between June and November 2010. Interviews ranged in length from one to two hours and were guided by a flexible list of questions and were digitally recorded and transcribed verbatim. Most interviewees had consistently worked or recreated within the parks between the early 1970s and the late 2000s. This extensive experience allowed them to reflect on the condition and character of SEKI wilderness prior to, as well as after, official wilderness designation. In addition, the recollections of two individuals dated as far back as the mid-1930s. Data analysis began with close readings of individual transcripts. This process generated a list of six major topics: wilderness characteristics, visitor use patterns, park field staff, education/exposure, management practices, and public relations. Interviews were then reread and coded according to these categories.

## Results and conclusions

Although a variety of themes emerged from these interviews, this study focused on those themes deemed most relevant to the management of Sequoia and Kings Canyon National Parks. The topics included: (1) impacts on wilderness experience, (2) changes in visitor use patterns, (3), perceptions of park management and, (4) the evolution of wilderness ethics. In general, those interviewed for this project felt that the wilderness character within SEKI had significantly improved since the 1960s and 70s. This improvement was primarily aesthetic; informants noted a decline in trash, campsite developments, fire scars, and meadow impacts. Interviewees attributed these aesthetic improvements to the “on-the-ground” efforts of SEKI’s field staff, as well as to a more educated visitor. Most interviewees expressed appreciation for the parks’ attempts to preserve opportunities for solitude, self-reliance, and unrestricted travel. However, they also expressed concern regarding the parks’ ever-expanding regulatory system. Several stock users pointed to inconvenient restrictions as causing a decrease in both park visitation and cultural diversity. Other interviewees

wees, including two park managers, noted that a plethora of park regulations (accumulated layer by layer over the years) had fundamentally altered the wilderness experience of visitors. Interviewees also claimed that changing visitor use patterns, such as the concentration of campsites along popular trail corridors and the increased interest in adventure sports, were creating new challenges for park managers. They hoped that the parks would address these issues proactively, rather than simply “muddling through” as in the past. In addition, interviews with long-term wilderness enthusiasts demonstrate a constantly evolving ethos in

which experience and identity become inextricably linked and serve to define respondents as ‘enlightened’ wilderness users. Oral history appears to be a particularly effective tool for evaluating the efficacy of management practices over time as well a means to explore evolving practices and ethics in wilderness use. These findings also helped to corroborate and explain observed changes as documented through the Parks’ larger wilderness condition monitoring program.



## ORGANIZED SESSION: ORAL

## Recreation “betwixt and between”

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There is a continuum from ‘virgin’ nature to ‘denatured’ urban, within which we can locate spaces variously known as urban proximate, peri-urban, urban-rural fringe and others. These spaces are under pressure from urban expansion and are facing increasing recreational demand. Additionally, the diversity of ecosystems and often highly complex systems of governance may offer challenging conditions for management. Yet it is argued they can offer distinctive opportunities for recreation unavailable in ‘urban’ or ‘wilderness’ environments. Such opportunities may demand permanent infrastructure or occasional occupation for events or festivals and may be highly visible or even concealed from public view. This session addresses the conceptualisation of spaces of nature that fall betwixt and between the ‘urban’ and the ‘wilderness’ and the implications for recreation participation and management. It seeks to explore the personal, social, cultural and ecological factors which affect human-nature relationships in these spaces and the activities and performances that shape experiences. This session invites papers which address the following sub-themes:

- Contested definitions of natural spaces and the distinctiveness of the urban proximate.
- Conceptualising the social construction of spaces of nature.
- Urban proximate spaces as a resource for recreation.
- Urban proximate spaces as a location for deviance.
- Experiential dimensions of urban proximate recreation.
- Managing leisure in urban proximate spaces.
- Managing social-ecological systems for recreation.
- Governance, protection and development of urban-proximate spaces.

# Protected area within the city: Monitoring and management of visitors in Landscape park Tivoli, Rožnik and Šišenski Hrib in Ljubljana (Slovenia)

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A quality living environment is an extremely important value in the life of the modern man. Green surfaces are one of the key factors for pleasant living. Ljubljana, which spans on a surface of 275 km<sup>2</sup> and has approximately 280,000 inhabitants, is rich with green surfaces due to its architectural design. The green spikes that eat into the capital represent an advantage in quality with regard to comparable European cities.

One of the largest and most visited green surfaces is the 459 ha large Landscape park Tivoli, Rožnik and Šišenski Hrib, designated in 1984, spanning within walking distance to the west of the city center. The decree puts a special emphasis on the fact that this park represents the identity of the city of Ljubljana, where natural and cultural elements form a wholesome landscape image.

The area of the landscape park comprises the park-part Tivoli, the central forest part and the western part, including the green stripe along the POT (in the past known as Path of remembrance and comradeship, following the path of the barbed wire that encircled Ljubljana during WW II).

We carried out an extensive research in 2009 and 2010 on the role and importance of the landscape park. By using quantitative data such as counting visitors and charting the strain on certain trails on one side and carrying out surveys and interviews on the other, we attempted to determine whether the area is a value and how to develop it in the future.

We estimate that the Landscape park Tivoli, Rožnik and Šišenski Hrib is the most frequented protected area in Slovenia, as it is visited by about 1,750,000 visitors each year. Even though the Tivoli city park appears to be more frequented than the sloping, forested area, the analysis shows that both areas are similarly frequented. A notable difference occurs on the surface unit (Tivoli park 147 visitors/ha, central forest part 22 visitors/ha). The area is most frequented on Sundays, when up to 20,000 people visit it. Such a large influx to a protected area testifies that a landscape park is an important value in the eyes of the visitors and should be preserved. Park visitors can namely seek a quick and brief refuge from their daily worries. This was also confirmed by the executed survey, which revealed that the survey participants primarily connect the area with recreation, nature, and relaxation.

The answer to the elementary question of how many visitors can frequent a certain area at one time without noticeably endangering the local nature on one hand and still retaining its attraction to the visitor on the other can be partly answered by interviewing the landowners. They stress

the visitors' inappropriate behavior and the need to educate them. We may conclude that the number of visitors is not the deciding factor in determining the carrying capacities, but the visitor "quality" (awareness). Therefore the number of visitors is not, or at least, should not be the only criterion in identifying the carrying capacities of a certain area, although it is the most simple to measure. In addition to the number, the visitor structure is also essential, especially their reason for visiting (recreation, socializing, participating in mass events ...) and their behavior (respectful to the environment, fellow man, aggressive to their fellow man, the nature, the infrastructure). Familiarity with the most important forms of recreation activities is also essential in planning the recreation and recreation infrastructure, as the forms vary in their level of demanded attention, while some may even exclude one another or disturb each other to such an extent that the quality of the recreation is impaired.

Each of the three landscape park parts is recognizable by its specific characteristics, offers different ways of experiencing nature or leisure time activities and offers different habitats for the flora and fauna, which was also confirmed by the survey and the conclusions drawn from the available literature. The most common form of recreation in the forest part is walking, while cycling prevails in POT. One may meet pedestrians as well as bicyclists in the Tivoli park, even though cycling is prohibited there. A greater conflict may be sensed of the level of the less compatible groups of pedestrians and bicyclists, who mostly use the same paths.

The great influx of visitors to the landscape park has led mainly to a conflict between the landowners, visitors, and the objectives of nature and cultural heritage preservation. The numerous contrasts between the participants are impeding the regulation of the conditions in the park and represent a weight to the further area development. With the perceivable conflict of interest in the landscape park, it is evident the area urgently needs a professional manager to connect all the stakeholders and other interested public and prepare a development plan based on the evaluated heritage and zone the areas to satisfy the recreational, social, and aesthetical notions and also some strictly delineated nature conservation areas.

The central forest part of the landscape park that represents the highest value is intertwined with about 85 km of different types of paths (300 m/ha). The problem lies in this intertwining in the area, as it enables the visitors to move freely on practically every corner of the landscape park. It would be sensible to zone the landscape park in accordance with the principle of a thicker net of arranged footpaths on



Figure 1. A distinct conflict between the pedestrians and bicyclists can be noticed in the Tivoli park.

the outskirts and a sparser net in the central part, which involves abandoning some footpaths. Visitations to the Landscape Park Tivoli, Rožnik and Šišenski Hrib will namely be easiest to supervise with deliberate quality and amount of infrastructure in the area and by redirecting the visitors to similar, but less strained locations in the vicinity. Collaboration with the people – informing the landowners, visitors, and other stakeholders will therefore be essential to the project.

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# Urban-proximate nature as a resource for events and festivals: a SWOT analysis

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Events and festivals are a key sector of the leisure industry and throughout history have interacted in a close relationship with the natural environment. Urban-proximate nature is utilised considerably, particularly for outdoor events. If there is to be a successful global transition to a green economy, a more strategic approach to using natural capital must be developed. A traditional business approach is to undertake a 'SWOT' analysis and this strategy is adopted here as a first step. In this conceptual study, desk research using secondary data from academic, industry and environmental sources was undertaken to produce an analysis of the events and festival sector in relation to urban-proximate nature.

A 'SWOT' analysis, i.e. the strengths, weaknesses, opportunities and threats which are likely to impact on strategic development of an organisation (Johnson et al. 2011) is used to diagnose its strategic capabilities. The strengths and weaknesses of an organisation arise from its internal environment and the opportunities and threats derive from the external environment. Here I adopt the same approach in relation to the natural environment as a resource for events and festivals. For simplicity, the internal environment is that of the natural world, which is differentiated from the external environment of the social world which impacts upon it. The social world has two principal components, the socio-cultural environment and the socio-technical environment. However, the contested notion of '*external nature*' (Phillips and Mighall 2000) is acknowledged and hence both perspectives of environmental determinism and cultural determinism are adopted. Similarly, a 'dialectical' conception of society when applied to society-nature relations is appropriate as it stresses both social and individual agency.

I contend that the 'Strength' of natural capital as a resource for events and festivals, is its sheer *abundance* and *variety*; its 'Weakness', is its *unpredictability*, the 'Opportunities' arise from *cultural and technological agency* and its *vulnerability* is a 'Threat' to it.

Urban-proximate nature is *abundant* throughout the world and is available in many forms, both aquatic and land-based. Venues for outdoor events include coastal waters, rivers, lakes and canals. Land-based sites can be located on agricultural land, beaches, parks, woodlands, hills and mountains. These provide a variety of surfaces for event participants; grass, but also, sand, snow, ice, even mud. The sky above is also used for air shows and balloon festivals amongst others. The natural world also affords resources for events held both indoors and out. It provides the food and drink consumed at events, not only for nourishment but also as part of the offer – for example, the drinks consumed at wine, tea and rosewater festivals. Flora and fauna may be nurtured for events, such as flower festivals and animals are reared for entertainment and sport, such as horse racing.

The paper that is written on and the material for the bags that are carried and the T-shirts that are worn are all produced in urban-proximate lands.

The principal 'Weakness' of the natural world as a resource for events and festivals arises from the *unpredictability* of nature, particularly, of course, the weather in many countries. Every year, numerous outdoor events have their programme changed or have to be postponed or even cancelled, because of inclement weather. Other diverse natural phenomena may have an erratic impact such as the size and form of waves in coastal waters for sporting events; animals may not perform as desired and volcanic ash clouds have recently impeded travel to international events.

Culture, however, creates numerous 'Opportunities' for the natural world. There is a long tradition of events and festivals which revere nature, such as the Harvest Festival. Events such as conferences have always been at the heart of the environmental movement, for example, the United Nations Framework Convention on Climate Change adopted in Rio in 1992 and this year, its successor, Rio +20. Arts based festivals often depend on the natural world for their inspiration, thus stimulating its conservation. Socio-natural developments such as the breeding of domesticated animals and new plant varieties have been encouraged through agricultural and horticultural shows. Socio-natural places have been created as part of an event legacy, for example, the Sydney Olympic Park. Protection of the natural world has come about through societal expectations creating Standards for environmental protection, first specifically for the events industry, e.g. BS8901 in the UK and then generally e.g. ISO 14001. Cultural norms encouraging environmentally sensitive behaviour amongst visitors to events such as the recycling of materials may lead to behavioural change in other areas of their lives. The use of natural places for outdoor events can ensure their legal protection from development or exploitation in more damaging ways. Also technological solutions being developed, for example, modern media, allow a much larger audience to enjoy the experience of an event rather than limiting it to those who could physically attend, with the resultant environmental damage.

Finally, the principal 'Threats' from events and festivals are those of human activity in general, for example, carbon emissions contributing to climate change, the utilisation of natural resources, the creation of waste, damage to ecosystems and loss of biodiversity etc. Urban-proximate areas are of course, the most *vulnerable* to environmental exploitation and degradation and can ultimately be wholly lost through urban expansion, for indoor event venues, such as conference facilities.

SWOT analysis has two inherent dangers. It can be used to generate long lists of apparent strengths, weaknesses etc.,



without any prioritisation of issues. Secondly, it can lack specificity and can be based on preconceived or often inherited ideas (Johnson et al. 2011). However, it can help to focus attention on strategic choices through the development of a TOWS matrix, which uses the same information but through a different combination of factors, enabling four types of strategic options to be identified. The events and festival industry urgently needs to conduct further research in this area if it is to continue to have the natural resources available upon which it depends so heavily.

To conclude, a green economy requires not only that events and festivals are environmentally sustainable in their own right, but also that there is recognition of the continuing role of the industry in entertaining, inspiring and educating participants in and about the natural world.

# The role of the cultural background for nearby outdoor recreation behavior

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## Introduction

Recent literature suggest that attractive recreation areas in the proximity of urban settlements are of particular importance as they motivate the residents for physical activity and allow them to recover from daily work loads (Degenhardt et al., 2011). In German speaking regions nearby outdoor-recreation is a very common term for activities in these areas. In other regions, in particular in those with Latin cultures, no such term exists so that it has to be circumscribed in a rather complicated way. This raises the question whether nearby outdoor recreation is a specific phenomenon of German culture, or whether it exists in a similar form in regions of Latin cultures too. In the international literature, nearby outdoor recreation is not an issue, and research on the influence of culture on outdoor recreation focuses on the use of urban parks or remote nature parks (e.g. Sayan and Karagüzel, 2010; Gobster, 2002).

## Methods

With our study we wanted to find out which commonalities and differences in terms of nearby outdoor recreation can be found between residents with different cultural backgrounds. Based on a qualitative pre-study, we developed standardised questionnaires addressing a wide range of aspects related to nearby outdoor recreation. We then sent these questionnaires to random samples ( $N = 1200$ ) of residents of three middle-sized peri-urban Swiss cities with a mainly German, French respectively Italian speaking population. The questionnaires also recorded the cultural origin of the respondents' parents, so that a fourth (cross-regional) cultural group could be differentiated: Respondents of South European origin. The response rates of the surveys ranged between 22% and 29%.

## Results

Comparisons of mean values (ANOVA) revealed that in the Italian speaking study area, residents spent significantly less of their leisure time in the close to nature areas than in the other study areas, whereas their share of leisure time in the green space within the city was significantly higher than in the German speaking study area (see Fig. 1). Significant and systematic differences between the subgroups could also be found in respondents' outdoor recreation activities, their preferences of the area characteristics, their knowledge of the area, their preferred use of path qualities, and their outdoor recreation motives. Regression analyses corroborated that the cultural background was a much more relevant influence factor for diverse aspects of nearby outdoor recreation than gender, age or income. So health and restoration-related outdoor recreation motives could be explained best with the cultural background variable. On the other

hand, we could identify a number of shared features in the recorded outdoor recreation behaviour of the four cultural groups. So respondents from all four cultural subgroups showed very similar pattern of outdoor recreation activity, area, and motive preferences.

## Conclusions

The findings suggest that in spite of the linguistic differences regarding the term outdoor recreation and culture-specific differences in nearby-outdoor recreation features, the respondents of all four subgroups and all three study areas exhibited a typical nearby outdoor recreation behaviour. This behaviour is mainly characterised by a high variety of recreation goals including health, restoration and regeneration of resources needed for work as well as a frequency / short duration of the outdoor activity. In the Italian-speaking study area, however, the respondents' access to the outdoor recreation areas appeared to considerably worse and the use of the nearby outdoor recreation considerably lower than in the other study areas.

These insights implicate that in particular in Italian speaking regions, but generally in regions of Latin culture, where the concept of nearby outdoor recreation does not exist in a linguistic sense, more efforts are needed to communicate the importance of nearby outdoor recreation and a high quality of the outdoor recreation areas around the settlements. These efforts may include the creation of a new simplified term for this form of leisure activity, but also the explanation of the important function of nearby outdoor recreation for residents' resilience towards stress in their daily work.

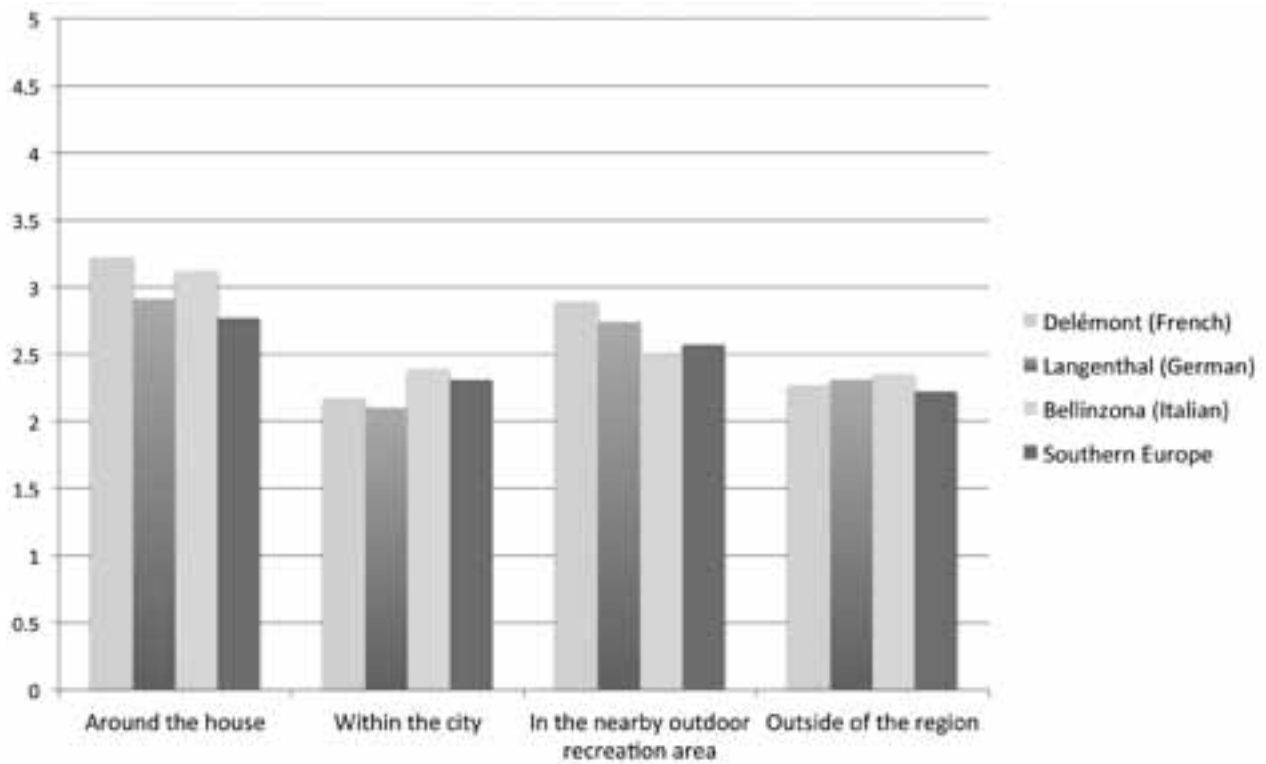


Figure 1. Mean values of cultural subgroups' share of leisure time spent in the green space of four different scales of their residential landscape (N=330). Scales: 1 = no time, 2 = little time, 3 = half of the (leisure) time, 4 = much time, 5 = the whole (leisure) time.

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# Visitor density, recreation motive, crowding and attractiveness

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Recreation planning in the Netherlands is partly based on the policy goal of offering enough nearby outdoor recreation opportunities to accommodate the local demand for such opportunities, at least for basic activities such as walking and cycling. Models have been developed to assess to what extent local supply and demand are in balance. In such models assumptions are made with regard to the social carrying capacity of certain types of natural areas: how many visitors can use the same area or path at the same time, without that this affects the quality of the recreational experience (too) negatively? However, the empirical foundation of the carrying capacities that are used in such models is weak, and largely indirect (see e.g. Sijtsma et al, 2012). This study focuses on the relationship between visitor density and crowding perceptions, and the extent to which this relationship depends on the motive behind the recreational activity and the type of area in which it is carried out. It also deals with the importance of crowding perceptions for the attractiveness of the setting, and how this depends on the same factors.

## Method

In an online experiment over 1600 members of an internet panel, aged 18 years or over, rated several 20-second movie scenes. Twelve realistic scenes were shot using 'actors' as visitors, with each scene depicting a recreational setting. Visitor density (2, 4, 8, 16 persons visible on a 100 metres stretch of path) was crossed with type of area (river foreland, forest, urban park). Moreover, two quite common recreation motives were selected: to experience peace and quiet, and to socialize with family and/or friends (Goossen, 2009). Participants rated six of such scenes on crowdedness, as well as on attractiveness as setting for a recreational walk, three with one motive in mind and three with the other motive in mind. For perceived crowdedness the scale introduced by Heberlein & Vaske (1977) was used, but with lower scores indicated more crowding. Motive, subset of scenes and order of the scenes within the subset were randomly determined for each participant. Since participants did not rate all twelve movies for both motives, the incomplete within-subjects design was analysed using multilevel regression analysis (Maas & Snijders, 2003). After the experimental part subjects were asked questions about crowdedness in their living environment, and the way they reacted to (anticipated) crowded situations.

## Results

Visitor density strongly influenced perceived crowding. Recreation motive had an equally significant ( $p < 0.001$ ), albeit much smaller effect. Actually, this effect only occurred at higher densities (interaction  $p < 0.001$ ): in those cases crowding was perceived to be stronger when the assigned

motive was peace & quiet than when it was socializing (see figure 1). Other factors and interactions showed less significant or no effects. Perceived crowding, in turn, strongly influenced attractiveness negatively. Recreation motive affected attractiveness, with the scenes being rated more attractive in the case of socializing. Additionally perceived crowding and recreation motive interacted: the effect of perceived crowding on attractiveness was stronger for peace and quiet than for socializing. Type of area also had a significant effect, with the forest being rated more attractive than the city park, and the river foreland in between. In addition type of area interacted with recreation motive: when the assigned motive was socializing, especially the forest and the city park were considered more attractive. The additional results showed that in the Netherlands 45% of the people that at least sometimes go for a walk in a green environment frequently adjust their walking behaviour to the (anticipated) level of crowding in favoured green areas. In addition 36% of these people indicated that they also frequently experience crowding during their visit. Moreover, 52% of the people that at least sometimes experience crowding during a visit, indicated that during those visits the crowding level is usually closer to extremely crowded than to just a little crowded.

## Conclusions

Results indicate that crowding in green areas is a common phenomenon in the Netherlands, which affects recreational experiences quite negatively. Although perceived crowding, and its effect on attractiveness, is influenced by the motive with which one goes for a walk, the differences between the two investigated motives appear to be relatively minor. Even when the motive is socializing with family and/or friends, high visitor densities have a strong effect on perceived crowding and thereby on the attractiveness of the setting. Also the effect of type of area seems to be relatively minor. Or, put differently, visitor density and perceived crowding have quite similar effects in different types of areas. One of the goals behind the study was to gain more insight in the extent to which social capacity figures used in normative supply and demand models are reasonable. Although basing social carrying capacities on a single experimental study obviously is a hazardous undertaking, we did so anyway, if only to see what the outcome is. Arguably almost all green areas in the Netherlands may be considered frontcountry settings. For such settings, Vaske and Donnelly (1997) suggest to take scores from 6 to 9 on the crowdedness scale as indicating an acceptable level and scores from 1 to 5 as indicating too high a level of crowding (values adapted to our reversed scale). Based on this suggestion and the experimental results we took four visitors per 100 metres of path as the upper limit for acceptable visitor

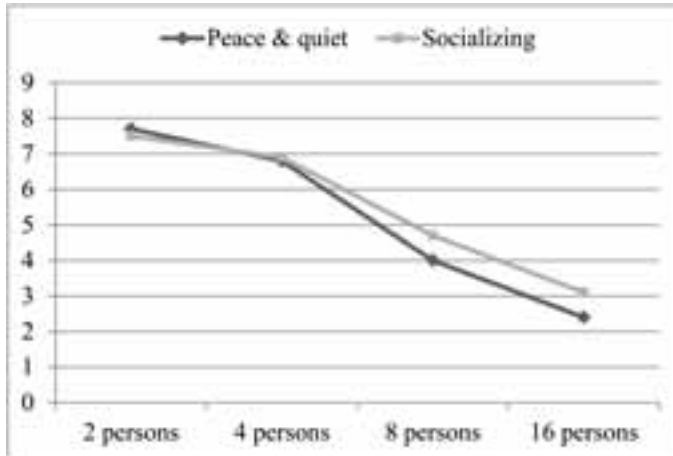


Figure 1. Perceived crowdedness by visitor density and recreation motive (lower score: more crowded)

density during the busiest hour of the day. For forests this would imply an average social carrying capacity of about 11 visitors per hectare per day, which is quite close to the value that is used for forests in the models that were referred to earlier: 9 visitors per hectare per day. Therefore the exercise suggests that there is no reason to drastically change the social capacities used thus far.

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# Get off my land! Managing youth leisure in multiple natural environments

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The UK has seen a rise of state managed outdoor leisure destinations in recent years, partly in response to government agendas to improve the nation's health by encouraging more active lifestyles in key population groups such as young people. The health agenda has identified young people as a target group for whom regular physical activity can help to prevent health problems, but whose participation in active forms of sport and leisure is low (Department of Health 2009). In addition there is what is perceived to be an absence of young people from activities which take part in 'nature' (Natural England 2006). This is despite evidence to suggest that that experiencing nature could play an important role in improving health and increasing levels of physical activity (Bingley and Milligan 2007). Experiencing the natural environment in childhood and youth is thought to be beneficial to the cognitive and social development of children and young people (Bell et al. 2003) and is claimed to hold multiple benefits for well being and future development of healthy lifestyles (Ward Thompson et al. 2006; Bingley and Milligan 2007).

Several initiatives have therefore focussed on improving young people's participation in physical activity and access to natural environments and has led to a rise in state managed outdoor leisure initiatives which place inclusivity of diverse population groups at the centre of their objectives (see DEFRA 2011). Sports such as mountain biking which are performed in a variety of natural environments and which appeal to young people's lifestyles and identities have formed the basis of some of these schemes and represent a significant opportunity to leverage participation. Young people perform mountain biking in a variety of leisure environments from open countryside and forests to urban fringe woodlands and derelict land all of which present different challenges and opportunities for managers to promote participation.

This paper will draw upon the findings of two research projects which investigated the experience of mountain biking by young people and the experience of managing and encouraging youth mountain biking participation by leisure destination staff respectively. The first set of findings relate to qualitative research conducted at a forest in the South East of England which received government funding to increase participation in physical activity in key target groups. The forest was redeveloped to provide facilities for mountain biking and opportunities for engaging young people in the sport with forty young people took part in ethnographic style research which included a series of semi structured interviews, mobile methods, participant observation and social media activities.

The second part of the paper will present preliminary findings from a recent study with forest management staff at several forest destinations in the South of England, all of which are supported through some form of state ma-

agement or funding. Ten forest managers took part in semi structured interviews to explore some of the management issues associated with young people's participation in mountain biking, paying particular attention to the differences between participation in urban proximate space and other natural environments.

The paper will first explore young people's use of different natural environments for mountain biking specifically highlighting the distinctive opportunities these different spaces can offer for the performance of youth mountain biking lifestyles, paying particular attention to urban proximate environments which are often easily accessible to young people and can offer more significant opportunities for mountain biking.

The paper will then focus on the practices which characterise youth mountain biking lifestyles which can at times present particular challenges for leisure managers. For example young people can experience exclusionary lifestyle practices such as localism, class based discrimination or sporting tensions between rival youth groups which could prevent access for some individuals. This therefore presents a challenge for schemes which seek to encourage fair access and participation for all. In addition experiencing risk is an important part of youth mountain biking lifestyles and participants describe involvement in trespassing, vandalism and unpermitted jump building as some examples of risky behaviour that can threaten the management of ecologically sensitive environments. The second part of the paper will therefore explore forest managers responses to these challenges and the different strategies employed for managing and enhancing opportunities for mountain biking. The notion of ownership emerges as central to the development of sustainable relationships between young people and management staff, with particularly important implications in urban proximate locations.

The paper will conclude by reviewing the implications of these findings in relation to government policy which places inclusivity at the centre of state funded initiatives in natural environments and consider the potential for urban proximate spaces to contribute to these agendas.

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# Educational needs of South African national parks' tour guides

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## Introduction

Parks under the authority of South African National Parks (SANParks) are distributed across many South African provinces. SANParks constitute almost 62% of South Africa's formal protected areas (Castley et al., 2009: 403). The Protected areas, including national parks are one of the major attractions to tourists visiting South Africa (Saayman and Saayman 2010). In 2008/2009 for example, 4, 374 739 people visited South Africa's national parks (SANParks) protected areas which resulted in the generation of ZAR 664.14 million in revenues (Strickland-Munro, Moore and Freitag-Ronaldson, 2010: 664). Tourism in SANParks provides nature-based tourism. Communication competency is essential for the interaction of guides and tourists in nature-based tourism in national parks in particular because it enables tour guides to fulfil the purpose of persuasion, education, resource protection strategies and entertainment (Goh, 2008; Hu, 2007).

The South African Tourist Guide Bill stipulates that people are allowed to use indigenous knowledge rather than formal education as the basis for becoming a tour guide and any gaps in professional knowledge should be filled by access to training opportunities (Spenceley, 2003). This is based on the recognition that under apartheid regime many black South Africans were denied access to formal, accredited training, and that development and training opportunities should be availed to them to gain competencies and experience.

Literature has shown that guides in protected areas lack the professional communication skills which enhance the conveying of scientific messages in a simple and interesting way that matches the educational and interest level of visitors (Carbone, 2006). In South Africa, tour guides join the industry from diverse educational backgrounds and this has resulted in a concern that guides in South African protected areas need to improve their communication skills (Paton, 2007). This raises concern on the educational background and guiding competencies of tour guides in South Africa. The aim of the study therefore was to identify SANParks' guides' continuing education and training needs.

## Interpretation and tourist satisfaction

It is generally accepted that interpretation is concerned with providing information to tourists in an educative, stimulating and entertaining manner about the places they visit, in order to promote the economic development, environmental quality and conservation and socio-cultural sustenance of such places (Moscardo, 2000; Reisinger & Steiner, 2006; Powell & Han, 2008;). In SANParks one of the key tourism objectives is to develop and grow a sustainable nature-based tourism business (SANParks, 2008:13).

The role of tour guides in enhancing interpretation has been of interest to researchers for a long time (Ham and Weiler, 2005; Ballantyne & Hughes, 2001; Cohen, 1985). Training is an effective mechanism for enhancing a wide range of guides' roles to ensure professionalism and competence (Hu, 2007:45). In the past, the standard training format was "front-end loaded" meaning that people were trained at the beginning of their working lives for a particular job and rarely received any further training. Nowadays education is recognised as a continuous process which equips employees with skills in a dynamic work environment (Eagles et al., 2002). It is therefore important to determine the type of skills needed for interpretation in order to cater for relevant interpretive training as well as continuing education and training (Chou et al., 2002).

## Research method

This was a descriptive study which used a triangulation of quantitative and qualitative data collection methods. Five telephonic interviews and one direct interview with six park officials were held. Purposive sampling was used to identify participants of the study. Interviews were transcribed verbatim and categorised into themes.

A survey of SANParks' tour guides was also undertaken. Twelve of the 24 SANParks provide interpretive guiding activities. Six parks which offer interpretive guiding were selected (see Figure 1). A convenience sampling was used to identify respondents. 98 questionnaires were distributed to tour guides, and 46 were completed and returned representing 47% response rate. SPSS version 18.0 was used to analyse data. Descriptive statistics were used to present data.

## Results

### Qualitative data

Most SANParks tour guides were qualified. SANParks also run in-house training for unqualified tour guides. Interviewees identified areas where tour guides needed further training to include research skills, communication with the visitors especially in other languages other than English, legislative requirements and general knowledge of the tourism industry.

### Survey results

SANParks tour guides were mainly black South Africans who had acquired academic qualifications and substantial guiding experience. The majority of guides (65.5%) had also received formal training in interpretation accredited by the South African accreditation body (THETA). SANParks also hired tour guides who had no formal guide training.

The majority of the tour guides (50% emphasised custo-





Figure 1. Map showing the six selected national parks (Source: SANParks 2008)

mer, followed by guiding (23.0%), and nature conservation (19.6%) as priority areas for training. Unlike the park officers tour guides ranked communication very low (N=3, 6.5%). Language was also not mentioned.

### Conclusions

There is recognition of the need for continuing education and training for tour guides in SANParks. This is in line with the literature where continuous education and training is emphasised as a way of keeping abreast with developments in the field (Pereira, 2009). The study also confirms that the right sort of training prepares guides to satisfy customers' basic needs and influence behavioural change (Mason & Christie, 2003). Other training gaps identified in this study included accurately understanding the sites,

hence the need for nature conservation training (Yamada, 2011:148).

The study makes significant contribution to published research on interpretation. The study shows indigenous knowledge system can enhance interpretation if complimented by on-the-job training. Indigenous knowledge system is an area that has been underplayed in guides further education and training. In a number of cases local people have developed valuable indigenous knowledge systems most of which is undocumented. Involvement of such indigenous people in the on-the-job training of tour guides can help transfer such knowledge to younger generations.

# Outdoor teaching on the school grounds and in the bush

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## Background

Research on outdoor teaching and learning mainly concerns learning in natural or cultural settings away from school, whereas research on outdoor teaching and learning on the school grounds is not as common (Thorburn & Allison, 2010). This presentation will report on results from a PhD project exploring longitudinal school-based learning in a Swedish junior high school. The project also includes a study on outdoor environmental education in Australia. In the literature on out-of-classroom teaching and learning, the significance of the place is often highlighted (Dahlgren & Szczepanski, 1998). In outdoor education as well as in the place-based education approach (Gruenewald, 2003) learning in the community and society as well as in the natural environment surrounding school is considered valuable. The rationale is that the study of places can help increase student participation, engagement and understanding through multidisciplinary and experiential learning. Place attachment and connectedness are other possible outcomes of outdoor teaching and learning. Connectedness to nature is a dimension considered important by many scholars as research suggest that children's experience of nature is decreasing in Western urban societies and schools thus play a key role in enabling children experiencing nature. The school grounds as a place for learning has received some attention (Dyment, 2005) but mainly in primary school. Studies reporting on barriers to outdoor teaching have found that time and cost for travel, inflexible curriculum, disciplinary issues and teachers' lack of confidence are some of the barriers limiting the amount of outdoor teaching (Bentsen et al., 2010).

## Purpose of the research

Regular school-based outdoor teaching, particularly in a high school context is not frequently researched. Thus, the aim with this research was to explore outcomes of regular school-based outdoor teaching in a Swedish junior high school. Another aim was to explore environmental education center officers' and high school teachers' observations and perceptions of children's experience of the natural world in Sydney, Australia.

## The empirical context

The data material consist of semi-structured interviews with twelve Swedish junior high school teachers, thirteen Australian environmental education center (EEC) officers and eight Australian high school teachers. The Swedish teachers participated in an outdoor teaching project where all teachers at a junior high school were involved. They participated in a professional development course in Outdoor education and during the intervention phase of approximately ten months (a Swedish school year) the students were supposed to receive about three to four lessons a week outdoors on a regular basis. The Swedish teachers were in-

terviewed before and after the intervention. The Australian EECs and schools were situated in different geographical and socioeconomic areas of the Greater Sydney region. An inductive thematic analysis, which seeks to find themes or patterns in qualitative data (Boyatzis, 1998) was used to analyze the data. Another set of data were self-reported loggers from two teams of teachers responsible for eleven classes (Year 7: n=4, Year 8: n=4, Year 9: n=3). The loggers comprised data of number of outdoor lessons, and in what subject, which were taught outdoors during the project year.

## Results and analysis

Before the one-year outdoor teaching project, teachers emphasized the significance of the place and discussed place-based learning in the municipality and nearby nature resulting in holistic and authentic learning as a major potential of outdoor education, but these expectations were difficult to realize. Instead, results from the Swedish high school project revealed that particularly social and physical space contributed significantly to teachers' experienced potentials of outdoor learning. It was mainly the school grounds that were used as a learning environment. Contrary to initial beliefs, the school grounds worked well as a place for learning for particularly language and mathematics teaching. However, the desired amount of three to four lessons a week and class was not realized which indicates that changing teaching method is difficult for a majority of teachers. At the end of the project, approximately 4.5 % of the lessons were taught outdoors which equals one lesson a week. There were a rather large variation between teachers and classes and only a few of the teachers taught outdoors on a regular basis. Contrary to initial perceptions of outdoor education as particularly suitable for science teachers and difficult to utilize for language teachers, only 0.6 % of science lessons were taught outdoors whereas 4.5 % of German lessons were taught outdoors. Increased on task communication and participation were two frequently reported potentials of outdoor teaching, particularly in language learning.

Outdoor teaching was considered time demanding in preparation and performance. Other barriers were inflexible schedule and crowded syllabuses. Initial expectations on increased teacher collaboration and multidisciplinary teaching were difficult to realize. The study confirms previous research revealing positive effects on social and emotional outcomes. The contributions from this study are that positive effects on social and emotional dimensions of learning also apply to a high school context and for learning on the school grounds. The context in the majority of previous studies is primary school and natural environments. Disciplinary problems was mainly perceived as a barrier before the project but many teachers reported on a rather long implementation period, up to three month before the students adjusted to the new learning environment. During

that period disciplinary issues were a concern.

If space was significant in the Swedish parts of the study, the place for learning was in focus in the Australian study. According to interviewees, the results reveal a picture of Sydney children as having limited experience of nature. The teachers' observations were that the children were interested and engaged but often were uncomfortable and even afraid in nature. Their limited experience further resulted in a de-contextualized and vicarious understanding of Australian ecology, flora and fauna.

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# Skill development and our perception of the environment: A phenomenological approach to canoe tripping in Canada

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## Purpose

This investigation set out to explore the perspectives of students who have participated in an outdoor learning programme that is theoretically underpinned by the perception of the environment, place consciousness and skill development. The study focuses on the student's socio-cultural and geo-physical stories from time spent, skills learned, and experiences made in the Canadian Rockies. Of particular interest for this study, is to explore ways of moving from a predominant wilderness discourse, with the view of seeing nature as something 'out there', something wild that is to be manipulated, controlled and concurred, towards an emerging ecological sustainability discourse in outdoor education practice. From this starting point, our aims are: (i) To provide insight into how skill development influence our perception of the environment, (ii) To provide insight into how sense of movement and sense of place may influence our lived experience and perception of our surroundings, and (iii) To provide insight into how power operates within this socio-environmental discourse, as well as what subject positions are made available, thus creating certain subject positions as more desirable than others.

## Method

The intention of this study is to follow the design suggested by Mullins (2011), who used Ingold's (2011) *dwelling perspective* to interpret performances and experiences, which allowed alternative accounts of the meaningful ways in which participants related to, as well as shaped their environments. This research project is designed in the form of a case study and a common place journey. Through the commonplace research methodology and from travelling together, the researcher can come to know some of the ways in which participants engage with, as well as understand their surroundings (Mullins, 2011). The investigation will examine observations and participant narratives from journal entries and group discussions, to explore engagement with place and issues of sustainability.

Each participant of this study will be asked to record individual observations and reflections on practices and experiences in a field notebook/journal. The units of analysis will be the various experiences made by the participants in the project. This case study involves examining the process by which our perception of the environment is built. The case consists of multiple levels of components, all by which will be examined through specific prompts asked to the participants, at different stages of the trip. Following Mullins (2011), five guiding topics will be used to focus participant observation and help the researcher recognize the relevance of events as they occur, both mundane and unexpected. Observations will be noted as soon as possible in a water

proof field notebook.

The guiding topics are:

1. *Skill*: How attention to landscape and environmental features was shaped by travel activities, tasks, performances, equipment, and other group members.
2. *Place*: Meanings, impressions, and knowledge of particular landscapes and places gained through travel, shared group experiences, individuals' past experiences, and encounters with other people and animals during the trip.
3. *Interrelationships*: The influences of individuals and group on surroundings and vice versa; how movement was shaped by environmental factors and landscape features.
4. *Self*: Identity and roles related to particular skills, tasks, environments, and places.
5. *Stories*: The role of stories within the group, as influencing travel, and as communicating landscape meanings within and beyond the group of participants.

## Results

Data was collected in May, 2012. At this point we can only show some preliminary results, since the data has not yet been fully analysed.

## Conclusions

Ingold (2005) admits a conspicuous lack of attention to power relations within his dwelling perspective, which has focused primarily on the material relations of life. According to Mullins (2011), greater attention to the interpersonal implications of outdoor education adventure travel is certainly needed and possible from the dwelling perspective. Therefore, our interest lies in exploring how skill development serves to influence our perception of the environment and our surroundings, as well as exploring how power operates within this socio-environmental discourse. For this analysis, we draw on a discourse perspective inspired by Foucault (1980). The investigation is designed in the form of a case study and examines observations and participant narratives from journal entries and group discussions, to explore engagement with place and issues of sustainability. To analyse the data, this investigation uses hermeneutic phenomenological approach and a commonplace journey, through which the participants and the researcher questioned and reinterpreted their experiences. All analysis in this project has the overarching purpose of providing insight into how skill development serves to influence our perception of the environment, our sense of place, and how power operates within this socio-environmental discourse.

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# An educational tool for outdoor education and environmental concern

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Although there are many indications that nature encounters can play a significant role in people's concern for the environment, an oversimplified belief in a general causal relationships are problematic. In this abstract we present an educational tool that respects the need to critically discuss the general relationship between experiences of nature, environmentally-friendly attitudes and behavioural change, but that at the same time respects the legitimate claims on the part of outdoor education practice for concretisation and clarity. The foundation of this model consists of a combination of theoretical perspectives and models that have been generated through a number of Swedish interdisciplinary research projects during the last decade. The presentation is based upon the article Sandell and Öhman (2012) where further references and discussions will be found.

## Environmental concern

“Environmental concern” can be said to consist of elements of all the various main themes of environmental engagement during the 20<sup>th</sup> century (Sandell et al., 2005) mainly: (i) *Nature protection* where certain areas (national parks, “wilderness”), places and objects (natural monuments, landmarks, preserved species) in the landscape are protected; (ii) *Nature conservation* seeing people as collaborating in the formation of the landscape with an increased interest in which landscape values are worth preserving and an awareness of that these values often are culture-related; (iii) The need for *environmental control* as nature and environmental issues not could be isolated to certain places, areas and species; and (iv) *Sustainable development* that includes both a globalised version of dealing with the symptoms as in environmental control and the demands of critical alternative thinkers for fundamental reconsiderations.

## Outdoor education

Different aspects of outdoor education are presented with the aid of two specific models: (i) principally diverse ways of motivating this education; and (ii) different approaches to the landscape when executing outdoor education.

The first way of motivating outdoor education focuses on the *instrumental values* of outdoor experience, i.e. that such experience consists of a suitable mean for different purposes, such as physical and mental health, group solidarity and a feeling for nature. In this case the valuable outcomes of outdoor experiences are separated in both time and space from the outdoor activities. The second way focuses on the *intrinsic values* of outdoor experiences, for example an affiliation with nature and a sense of humility towards the various non-human forces that can be experienced outdoors. Here the values are inseparably bound up with the outdoor experiences in themselves and cannot straightforwardly be found in the milieus and lifestyles of urbanised

modern society.

With regard to landscape relations we use Sandell's conceptual framework of ecostrategies (see e.g. Sandell, 1988, 2006, 2007) and identify three approaches to the landscape summarised as: (i) *active domination* where the landscape is regarded as a “factory” that should be adapted to the activity by means of different settings and requirements (ski facilities, adventure parks, climbing-walls) in order to produce the prerequisites the pedagogue is looking for; (ii) *active adaptation* where the activity is subordinate to the landscape (in terms of topography, time of year and weather) at the same time as one readily utilises and changes the landscape (hunting, fishing, log fires etc); and (iii) *passive adaptation* where one passively relates to the landscape and contemplates, studies and copes with the landscape and its accompanying topography, season, weather and animals (for example bird-watching).

## An educational tool

By relating the different aspects of outdoor education to the different themes of environmental concern a model that describes five main interconnected educational paths is suggested (Fig. 1).

*Path 1* is about how “outdoor pedagogic bridges” use outdoor contexts for deepening environmental engagement in the direction of sustainability. This path takes its point of departure in the “instrumental values of outdoor experiences” and is about using different outdoor contexts as a basis for discussions, experiences and illustrations of issues relating to people's relations with nature and the environment.

With regard to the utilisation of the landscape, the outdoor approach of “passive adaptation” can be an important source of inspiration in terms of wanting to protect animal species, plants or places from human impact in accordance with an environmental protection perspective (*path 2*). This is a basic mechanism in line with: “I like *this* place and I do not want it to be destroyed”.

The “active adaptation” approach can be an important source of inspiration for a nature conservancy perspective (*path 3*). The basic mechanism here could be described as: “I want to continue this hunting, fishing, berry picking, and these landscape values in this place must be preserved”.

Outdoor education motives in line with the “intrinsic values of outdoor experiences” have traditionally served as an important source of inspiration with regard to a more radical environmental engagement that includes issues of power and social planning (*path 4*). “Environmental politics” and “development issues” are however indicated in the diagram as main sources of inspiration for the perspectives of environmental control and sustainability, although we believe that a direct personal encounter with nature could be regarded as an important extra and complementary

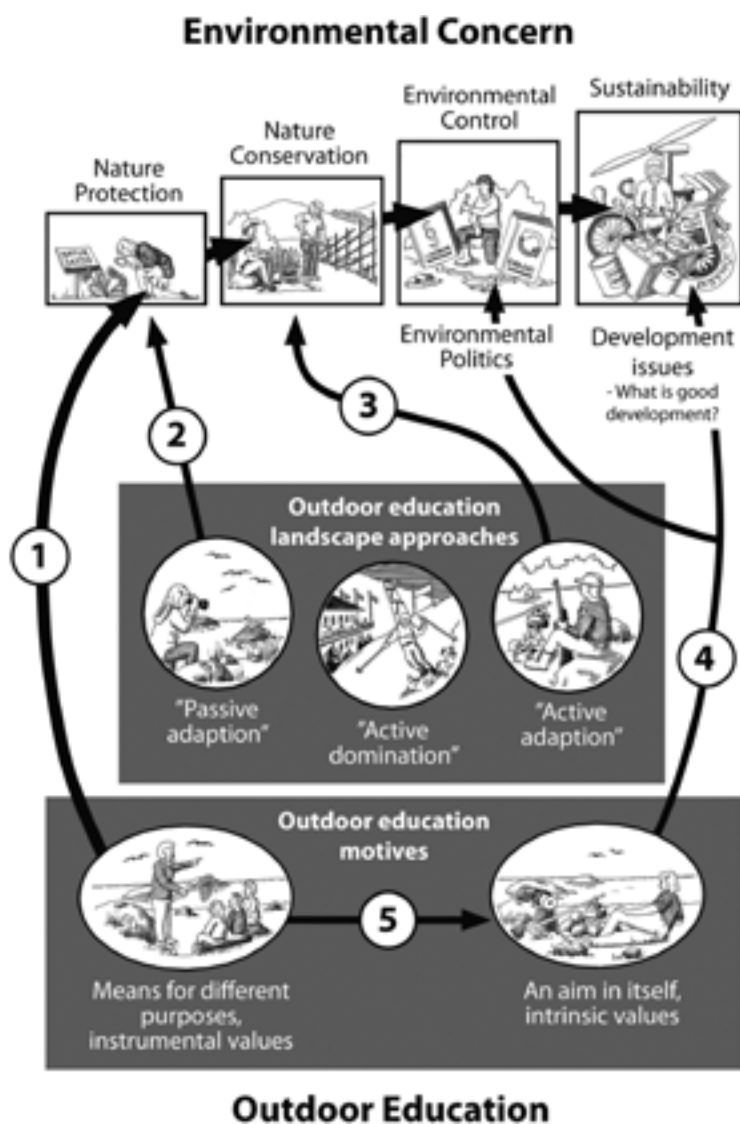


Figure 1. A model for outdoor education and environmental concern including the subtleties of “environmental concern”, “landscape approaches” and “motives” as well as five main environmental educational paths (Sandell & Öhman, 2012; drawing by Matz Glantz).

path. This is due to the fact that “intrinsic values of outdoor experiences” often indicate values that contrast with the conventional view of development in terms of material consumption, and therefore raise basic questions about the sustainability of “a desirable development” (see Sandell & Öhman, 2010).

Outdoor experience as “a means” can also give rise to the perspective of outdoor experience as “an aim in itself”

(*path 5*). As an outdoor pedagogue this is very much about capturing the moment; where the intrinsic value of contact with nature is given a place in outdoor activities even though it is in general motivated by different specific purposes (team-building, science, environment, self-reliance). It is also about nurturing more extensive and comprehensive environmental perspectives.

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# The importance of place for learning and teaching – an outdoor educational perspective

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## Introduction

### Theoretical framework

Outdoor education is an environment-focused educational approach characterized by action-centred and thematic learning processes frequently involving outdoor activities (Dahlgren & Szczepanski, 1998). It aims to foster learning through the interactions between emotions, actions and thoughts, based on practical observation in authentic situations (Dahlgren & Szczepanski, 2004). This perspective on knowledge and learning, where a diverse learning environment is emphasized, contrasts with the traditional educational system, which is based on theoretical knowledge taught in a classroom setting and which limits the interactions between emotions, actions and thoughts. Outdoor education has the potential to become an integrative, complementary education form in a pragmatic and progressive pedagogy tradition, which can offer students and teachers opportunities to learn on the basis of observations and experiences in authentic situations. Moreover, a more movement-intensive form of learning is created in outdoor education (Grahm, Mårtensson, Lindblad, Nilsson, & Ekman, 1997).

### Aim of the study and research question

The aim of this phenomenographic study is to describe the variation in respondents' experiences of outdoor teaching space-related practice, i.e. *what perceptions teachers have about teaching and learning outdoors*. This study focuses on the following two issues: (a) understanding which perceptions teachers consider to be significant for learning and teaching in an outdoor educational context; and (b) can these significant perceptions be observed and distinguished among respondents in the the study group?

## Methods

### Context of the study and data collection

The study comprises a total of 19 respondents (denoted by numbers 1-19). Thirteen work as teachers, five as principals and one as a member of the local education authority all have teaching qualifications. All types of schools are represented: preschool, primary school (preschool, primary and middle school) and high school. To illustrate various physical learning environments, especially outdoors, an interview guide was constructed with "open questions" and photographs: school environment, urban areas ('grey'), aquatic ('blue'), industrial environments ('grey'), and forest habitats ('green') during the interview. The purpose is to highlight the didactics – the issue related to the questions in the interview guide. The following interview questions pro-

vided the conceptual framework: *What is outdoor education for you, what is knowledge for you, how do you teach about environmental issues and why do you teach, as you do*. Data formation rests on a "convenience sample", where principals could choose the respondents (Bryman, 2002). After the completion of 19 interviews "theoretical saturation" was reached (Glaser and Strauss, 1967).

### Data analysis

The transcribed interview responses were used as input for the analysis. The analysis was conducted in five stages with nine categories identified and systematized:

First, different keywords in the major text sections were indicated in the margin in order to obtain an overall impression. Second, statements were distinguished and sorted into different categories based on description of possible patterns – similarities or differences, to identify the different views. Third, a clearer picture of the text's content (core beliefs) crystallized after a further reading of the interviews. Fourth, a labelling (naming) and description of what is peculiar to each category was conducted. Fifth, identification and systematization of the teachers' perceptions were presented in a category system (cf. Uljens, 1998).

Marton and Booth (2000, p. 163) sets out three criteria for properties that description should include as categories, namely, that they say something clear about a particular way of conceiving the study phenomena, that they are logically related to each other, and they are limited in number, allowing the critical variation to be narrowed down. These three criteria have guided the analysis. To ensure accuracy in the categorization of the interview material, consultations and negotiations with the co-examiner have taken place in accordance with what is called "Negotiated Consensus" (see Beerman et al. 1997) in order to increase the validity of the categorization.

## Results

The analysis of the results in the form of description categories with illustrative quotations is presented below. Based on the phenomenographic analysis, respondents' perceptions are described through nine main categories, which together form the "room of the outcome" in the study.

*Learning and teaching outdoors offers opportunities to:*

- A. discover environments for learning other than the classroom,
- B. use larger open spaces,
- C. make use of spatial diversity,
- D. link theory and practice,
- E. support interactions between different learning environments;



- F. apply physical, sensual learning,
- G. create varying meetings with a lot of outdoor phenomena,
- H. use time more freely,
- I. create an outdoor platform for environmental work.

### Conclusions and implications for teaching

The analysis is based on some opinions that are more or less developed than others. The categories represent ideas whose meanings are qualitatively distinct from each other (Uljens, 1989 and Alexandersson, 1994). If outdoor education as a didactic tool is to have a greater impact in the Swedish education system we need more research into and knowledge about outdoor education theory and practice, the relationship to and importance of interactions between different places of learning: what, where, when, how and why teach outdoors? And in what ways may the place and the question “where” be a factor in explaining the basis for the variation in learning results, both indoors and outdoors?

It may be that students and teachers in XX municipality are fortunate with respect to a rich variety of available learning environments. Some uncertainty appears, however, in this study, both in terms of subject and didactic knowledge in outdoor education. It is therefore important in all education of our children and young people to argue for an increased awareness of place and space sense (sense of place) (cf. Grunewald and Smith, 2008). It is learning “about, and in” landscape (urban and rural) and to take the green, blue and grey learning environments in possession (Szczepanski, 2011). The study shows that the “didactic gap” must be filled with knowledge of the various places relevant to learning and teaching and the place of learning; this question must be put in the foreground in relation to both the subjects and topics of current and future teacher training.



ORGANIZED SESSION: ORAL/PANEL

## Communities in change: managing local tourism impacts

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With a rise in tourism worldwide, the importance of community management becomes increasingly vital for ensuring positive local outcomes from tourism. Nature-based tourism is often centered around communities sensitive to change, whether economic, socio-cultural or environmental. This interactive panel discussion invites contributions that include research covering supranational to local level management in differing geographical contexts. Studies of the local impacts of tourism, both positive and negative, with a focus on particular approaches to managing change are welcomed. Future management issues related to climate change and other exogenous factors affecting local development are also welcome.

# Connecting nature, culture, and art in the context of socially responsible ecological tourism

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After facing with mass tourism and its destructive impacts on particularly national parks, alternative approaches have come into the focus of tourism literature. The World Tourism Organization (EC, 2003:5) predicted alternative tourism movement and facilities would take 20% of the general tourism economy in near future and a shift from “sun and sand tourism” to other segments. The shifting is shaped by several factors: a) people are encouraged to experience new places and cultures, b) transportation opportunities become more available, c) holidays become longer, d) people are more active for cultural and social activities, e) awareness of environment impacts. This shift to nature, culture, religion, sports, ecological, scientific, has driven sustainability concept permeating all practices after a milestone report (WCED-1987) for conservation of resources effectively (Krüger, 2005:579; Leung, Marion, & Farrell, 2008:20). In ecologically sensitive areas, sustainable tourism has become the umbrella concept for acquiring economic, social, and environmental benefits continually. Ecotourism is then defined as “responsible travel to natural areas that conserves the environment and improves the well-being of local people” (TIES, 1990). It has also been described as small-group “appropriate travel”; “socially responsible tourism” (Sirakaya, et al., 1999); and it is highly related to commercial activities, such as SMEs (Gala, Galb, & Hadasc, 2010:281). Ecotourism could provide the impetus and economic investments and conservation of species and habitats (Lopez, 2002) and also amalgamate with the other tourism activities (Wommels, 2009).

Ecotourism contributes to (Diamantis, 1999; Moskwa, 2010): a) conserving natural areas where initial criteria for assessing ecological sustainability in tourism related economy is to monitor and lessen the unintentional harms of tourism activities (Leung, Marion, & Farrell, 2008:20); b) deploying gathered income which means ecotourism is a business industry, a network industry, and a market driven industry (Libosada, 2009: 391) and the portion is held by ecotourism in tourism industry increasing; c) promoting cultural and traditional values by educating tourists which relies on the ethical and cultural assumption that respect the cultural assets (Donohoe, 2011), d) containing interpretation/learning experience; e) prompting responsible actions for tourism industry and tourists; and f) emphasizing cultural identity and participation on decision making process particularly for local governments, entrepreneurs, and community (Wood, 2002). Emphasizing cultural and artistic assets is vital for socially responsible ecological tourism (SRET). The description for SRET suggested in this study is “*Social ecological tourism concept that contains and enhances facilities of culture, science, and art, promotes both learning and entertaining while considering in respect to local people, nature, and existed culture.*” The concept of social

ecological tourism is based on the principle of sustainable development, learning by doing, practices of science, art, nature and cultural living and it boosts the values of nature and culture with respect. The conceptual framework is given in Figure 1.

The purpose of this study is to provide SRET and review an example of the current and past activities and local initiatives in wildlife and biodiversity conservation in Kackar Mountains of Eastern Black Sea Region. This case is about a local outdoor recreation initiative, bringing local communities in action to promote ecological values while connecting the elements with culture and art, such as drama, music, drawing, traditional lifestyle of mountain villages. We discuss that such local initiatives are, in fact, effective in keeping the nature in balance with other activities through applying socially responsible tourism as a sustainable business case. We will address the benefits of SRET to society by looking at the needs of the communities where SRET could make contribution to their well-being and living conditions SRET promotes the values of nature and culture are in need to conserve for future generation.

The components of SRET (McKercher & Hom, 2002; TIES, 2000; Amatya, et al., 2010:74-75) are taken up at national, regional, and local levels; therefore the methods applied for this study are: a) SWOT analysis; b) participative observation; c) semi structured interviews (with entrepreneurs and local authorities); d) documentary analysis.

The high plateaus of the Turkish Eastern Black Sea region are one of the most important areas of Eastern Europe regarding biodiversity and nature conservation. This area is extremely valuable with its old growth forests, plant diversity, wildlife, landscape beauty, and untouched nature. Kackar Mountains (3937 m) is partly protected under the status of a National Park, which is managed by the Directorate General of Nature Conservation and Natural Parks of the Ministry of Environment and Urbanization. While there are many other sectors actively involved in the area, such as forests, agriculture (tea planting), rivers, and tourism, there is a fragmented administrative structure that may affect people’s lives, especially in the villages of the high plateaus of the precious natural resources. Over the past 10 years, these local actions bring people together from various parts of Turkey for outdoor camping on the Amlakit plateau (~2.600 m.) for promotion of the natural, historical, and cultural values through the involvement of local young people who support and generate local income from these activities. There are a wide variety of wildlife, with wolves, bears, pigs, wild goats, deer, jackals, and wild hens in this area. Facilities for outdoor recreation in the Kackar National Park are mainly in Ayder Plateau and Camlihemsin town. Others include few designated camping areas, because trekking is becoming more popular by national

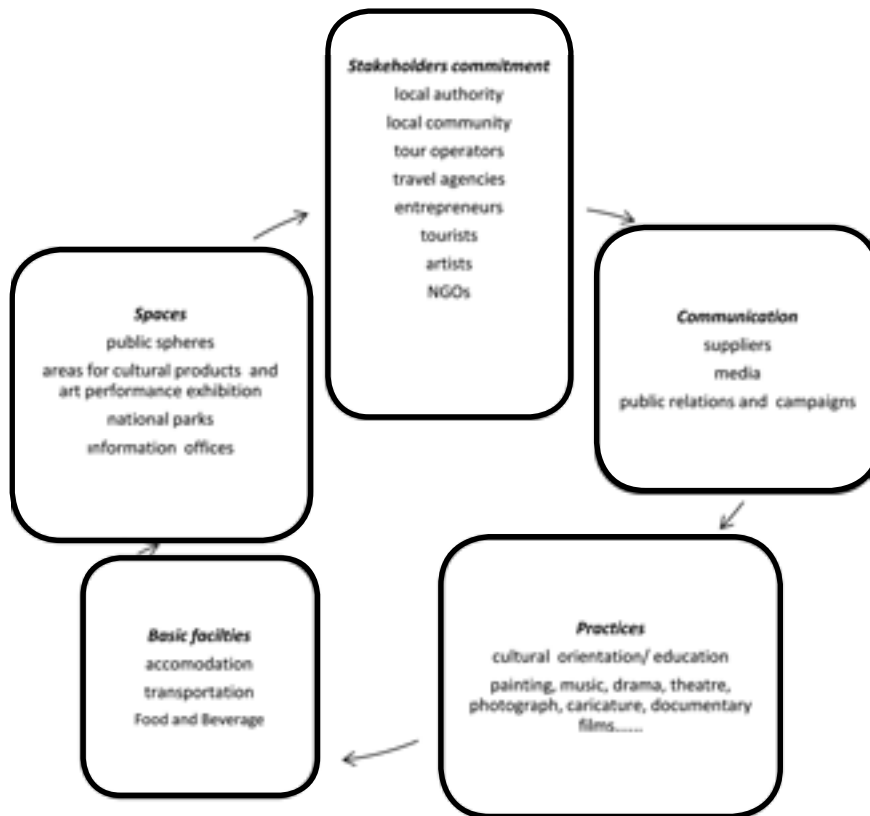


Figure 1. A Conceptual Framework for SRET.

and international tourists. The current trends and situation identified by SWOT indicated number of strengths; such as rich flora/fauna, endemic plants (orchids etc.), rare animals (Caucasian grouse), registered status of the national park and its accessibility with a strong cultural identity as well as high interest from academic (fishing, wild-life watching) and artistic (writing, nature photography, art performance) makes this location a unique place for its visitors. However, there are still lack of interests from 'green' NGOs and insufficient knowledge and skills by local guidance and governance about the value of the area mainly due to the low awareness of these values. In addition to these, absence of public management (info desks, leaflets, maps, etc.) and marketing leads to the migration of youth population to other big cities. By recognizing the room for improving the situation, local stakeholders found great opportunities

for collaboration with international nature conservation organizations, (NGOs, governments, science and education institutions) using national funds for targeted project development for this area. It is also found that local employment opportunities are better in the ecotourism field. Threat from mass tourism and planned hydroelectric power plans in the whole region combined with the unplanned urban development could only be tackled with the good practices and showcases.

In conclusion, we observed that mass tourism trend is still predominant in Turkey. The example provided in this paper suggests that more interaction between cultures (not talking to but talking with) have potential chances for such local initiatives to contribute the region's natural values and economic conditions with the assumption that SRET concept could interject these solid practices.

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# Tradition and innovation in farm-based nature tourism: Lessons for protected area management

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## Introduction

This study is focused on farm-based entrepreneurs, their place relations and values, and the process of meeting new demands in the development of nature-based tourism. The study is based on interviews with farm-based tourism entrepreneurs around the Trillemarka nature reserve in eastern Norway. We analyzed whether the entrepreneurs are situated on a dynamic continuum between tradition and innovation to more fully understand the nature of creativity and innovation at the farm level. With this, we also wish to contribute some knowledge for tourism development as an element in integrated development approaches in regards to protected areas (1).

Farming has traditionally been connected to the production of food and fibers as raw materials. However, during the last few decades this type of production has decreased in regards to the overall rural economy (2, 3). Consequently, both income and employment opportunities in the traditional agricultural sector have dropped. This has resulted in the establishment of various diversification schemes to encourage entrepreneurship on farms, many of which focus on farm-based tourism. Farm-based entrepreneurship is a complex phenomenon often raising issues in terms of identity, lifestyle and values (4-7). Much of farm-based tourism in Norway is related to nature-based tourism; as both forms of tourism are sub-sets of rural tourism. With nature-based tourism we mean tourism that are dependent on nature, enhanced by nature or are situated in nature coincidentally (8).

## Theoretical framework

As the early entrepreneurship research focused on economics and personal motivation, current research look more at entrepreneurship as multi-sided, process-oriented and with a larger attention to social, spatial and everyday contexts (9-13). Further, the role of place; its assets, people relations and culture have received more interest in the research on entrepreneurship and innovation (10, 14-18). We find the broader view of entrepreneurship, as well as the attention to place, to be fruitful perspectives in our study, especially since farm-based entrepreneurs often stand in an intimate relationship with their own place and its larger context. Although an entrepreneur is shaped, by context or structure, is also important to note that the entrepreneur is able to take an active step to override the context and create new social praxis (19, 20). This challenging, yet creative process forms the basis for new creations of value, what we might call innovation (16-18).

In our study, we use the Structural Life Mode Analysis (14, 21-25) to gain a more systematic knowledge of farm-

based entrepreneurship as a phenomenon that seemingly stands between tradition and innovation. We find this to be an interesting analytical perspective since it links both the physical dimension of farm-based activities and the mental understanding of it. It is a useful perspective in examining how basic values and norms are challenged, or stretched, with the onset of structural changes, like decreased income from traditional agriculture and the need for diversification (26). This process of revising, or stretching, values to adapt to new situations has been called "neoculturation". The structure of a life mode will continue, although with new content (14, 21). We classify farm-based entrepreneurs as belonging to the independent-life mode. This is developed further in a model for good agronomy that identifies certain basic social values among Norwegian farmers (23-25). These are values that have been stable over time and to a large part connected to the farm and traditional production. With structural changes, there is an onset of new and challenging values.

## Findings

Preliminary results from our study show that farm-based entrepreneurs facing new values and demands are challenged in the following ways:

- The strong value of independence and the corresponding lack of deeper commercial cooperation between farms is a challenge when there is a need for flexible network cooperation in the packing and distribution of tourism-products. New forms of mobilization and organizational structures seem to be needed.
- Farmers view their own traditional stewardship of the farm and natural areas as the primary value. The farmers have a tendency of looking into history towards traditional (production oriented) ways than to fully adopt new experience based forms of farm and nature-use. This can be a deficit when developing tourism products and meeting foreign customers with other frames of reference. In a simplified way, we could say that farmers are occupied with the products from the farm and nature, Norwegian visitors use nature in solitary ways and foreign visitors view nature (including the farm).
- There is seemingly a larger focus on tradition than true innovation among farm-based entrepreneurs. There is much creativity among farm-based entrepreneurs. However, this seems to be used in finding good imitations of other successful tourism products, rather than critically reflect on their own place and develop new inventions.
- There seem to be a need for new terms to describe

Table 1. Farmers values

Traditional values	New and challenging values
Stewardship connected to the farm	Place, hamlet and landscape attachment
The management responsibility	Multifunctional host, guide
Proficiency	Practical communicator
Production orientation	Experience producer, service, provider of landscape goods
Independence	Fleksible cooperation. Networks

the room in between tradition and innovation to more accurately describe the creative process that takes place there (18).

## Lessons

- Much tourism development starts with the tourism product, distribution and the attractiveness of protected areas. However, our study shows that in a

development process, it can be an advantage to focus on people and place, as in the farm and the surrounding landscape (including the protected area).

- There is a need to critically reflect on the nature views and use, of farmers (the supplier) and the various customer groups. More knowledge can perhaps lead to more effective and innovative tourism products.

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# Understanding tourists' choices in a developing tourist community

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## Introduction

Recently tourism has gained currency as both a poverty reduction strategy and a means to promote the conservation of biodiversity for lower income nations. Poverty reduction is a central concern for Uganda with a GNI of US\$500 (2010) and 35 % living below the poverty level. Concurrently, Uganda's population (34.5M) is growing rapidly with a 3.1% annual population growth rate and has been estimated to reach 150M by 2050 at current growth rates, placing unprecedented pressure on the country's natural resources. Uganda is a country rich in natural and cultural resources with opportunities for sustainable tourism, providing local impetus to support the conservation of wildlife and natural areas. In order to capitalize upon this potential, Ugandans must derive benefits from tourism. Although critiques of ecotourism in Africa caution on its natural and cultural limits (Laudati, 2010), community conceived alternative tourism development strategies can lead to rural development and avoid dependency (Lepp 2008). Developing local capacity to research, plan and manage natural resources is essential to sustainable development of tourism products and realizing profits (Ashley, Roe, & Goodwin, 2001). In 2006, the University of Manitoba and Makerere University began a 6-year project aimed at enhancing rural livelihoods in support of biodiversity conservation through sustainable community based tourism (see Campbell, MacKay, & Dranzoa, 2011). A key subcomponent of the project was the development of locally initiated tourism activities in project partner communities bordering protected areas. The first of the communities to be engaged in community tourism, Ruhija, organized itself in to several community groups under one umbrella community group, the Ruhija Community Tourism Association (RCTA). The success of initiatives such as these depends, in part, upon understanding visitor's images of the destination and using this information to enhance their experience and promote repeat visits.

## Context

Ruhija (pop. 1200) is located in the Virunga Mountains of southwestern Uganda on the border of Bwindi Impenetrable Forest National Park, a UNESCO World Heritage Site. The Park and larger ecosystem that includes the Albertine Rift, Parc des Volcans in DRC and Virunga National Park in Rwanda are recognized as a global biodiversity hotspot and is home to the endangered mountain gorilla (*gorilla beringei beringei*). Gorilla tracking forms the backbone of Uganda's primate based tourism offerings and accounts for 70% of all Park revenues. While gorilla tourism has been taking place in Uganda since 1994, gorilla tracking only became available in the Ruhija district with the habituation of

the Bitakura group in 2008. This spurred the UM-Makere team to assist the community in the development of the Ruhija Gorilla Friends Resort Camp. Majority ownership of the camp (80%) is composed of small investors while the remaining 20% is owned by the larger community through the umbrella organization RCTA.

## Method

In order to determine tourists' perspectives on the community tourism offerings, 55 semi-structured interviews were conducted with tourists who stayed in Ruhija between August 19 and September 18, 2011. Interviews were conducted in English and took approximately one half hour to complete. Only 10 tourists declined to participate. Another 28 were unable due to time constraints. The 10 individuals who declined to participate indicated that they were not comfortable answering the questions in English.

The interview guide development and procedure followed Patton (2002) and included questions related to destination image, leisure specialization, and activities undertaken on the trip and specifically at the site. A thematic content analysis utilizing open and structured coding provides the basis for the findings. Firstly, the interview audio recordings were transcribed verbatim. Question responses were analyzed individually and then considered across questions for recurring and unique themes.

For this paper we are considering the responses to questions that focused upon the tourist's image of the destination along with pre and post trip decisions with respect to the destination.

## Results

When asked to share their impressions of Ruhija, respondents expressed thoughts ranging from the descriptions of the people "open lovely people", the community "isolated, poor, alive", the landscape "beautiful-gorgeous" "wild dramatic", infrastructure "awful awful roads" and the environment "impenetrable green". Most often respondents talked of the gorillas, the lush beautiful landscape and the friendly people.

Respondents were also asked to describe what pictures they would share that described Ruhija and two themes dominated – not surprisingly gorillas and cascading mountains. In addition respondents identified the village as focus of their shared photos. In response to the question "why did you choose Ruhija?" responses can be characterized by the response "we didn't" as most respondents were in Ruhija due to availability of gorilla permits and the plans of their tour groups. When asked if they would return to Ruhija respondents were fairly evenly split between those who would and those who would not return. Those who would not



return responded so “not because we were disappointed but there are so many other places to see” reflecting something of the life list mentality. Those who would return cited their desire to pursue other activities with a particular focus on birding.

## Conclusion

For decades destination image has been supported as a primary factor in deciding where to travel (Hunt, 1975; MacKay & Couldwell, 2004; Tasci & Gartner, 2007). As the summary impression of a place comprised of cognitive and affective evaluations, image is an essential ingredient of tourism. The dominance of gorilla tracking as the destination choice driver was reinforced by the image and impressions while at the location. This image verification

(Okoroafo, 1989) was illustrated by the choice of likely photographs to share. The preliminary results suggest post visit image would not be particularly influential on repeat visitation in this context of a developing tourist community in rural Uganda. The current focus on gorilla tourism ignores a significant opportunity to engage repeat visitors and lengthen visits in the form of birders and those interested in pursuing other activities in the community. Additionally, tour operators should be informed of other activities available in the so that they can include these in their offerings. While the tourism initiative is currently successful, long-term viability will require product diversification.

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# Managing tourism in a popular wilderness destination

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## Introduction

Visitors go into the wilderness to see beautiful unspoiled nature where human presence is absent, or is believed to be absent and therefore human-made constructions reduce wilderness experiences considerably (Manning, 1999). The idea of tourism carrying capacity (TCC) has been used in wilderness and tourist destination management for assessing the impacts of tourism, both from the point of view of the impact of visitors on the environment, the physical carrying capacity, as well as from the point of view of the impact people have on other people, that is the psychological carrying capacity. Butler's (1980) model of tourism area life-cycle describes the stages that tourist destinations go through as the various capacity (e.g. environmental, social and economic) levels are reached. As the destination develops, the type of tourist changes, from adventure seekers in the involvement stage, to mass tourism in the stagnation stage. Many different variables can be used to distinguish visitor segments. Tourists can, for example, be analysed by the type of trip, characteristics such as nationality, age and sex, or their attitudes towards various factors. One of the most notable such models, was the so-called Purist Scale which was developed by Stankey (1973) in order to compare visitor perceptions and use of different wilderness areas. The TCC concept and the models Purist Scale provide valuable tools for managing tourism. The TCC concept structures the information gathered, which can then be used when deciding how many visitors are suitable for each tourist destination, what type of tourism is appropriate and how to manage tourism according to target groups. When that has been decided, decisions regarding capacity can be taken and if the destination is threatened by overuse, maximum numbers of users should be set.

Wilderness is often used as an image in the promotion of Iceland and is an important part of the tourism product (Sæþórsdóttir, 2010). Tourism has expanded rapidly in the country in recent decades. Nature is the main reason that 88% of foreign visitors come to Iceland and more than one third visit the Central Highlands which is the uninhabited interior of Iceland (Icelandic Tourist Board, 2012). Landmannalaugar is by far the most popular tourist destination in the Highlands. This very fast growth of tourism to the country and into the wilderness raises concerns regarding the difficulties of maintaining the qualities of the resource and the experiences of visitors. This study focuses on tourists' attitudes in Landmannalaugar and whether they have changed in a decade by comparing data that was collected in the year 2000 and in 2009. The research questions addressed in this paper are:

- Has the composition of tourists changed?
- Is there a change in the attitudes and satisfaction of the visitors in this period?
- How should tourism in the area be managed in the future?

## Methods and main results

The study was conducted in Landmannalaugar which is a nature reserves of 470 km<sup>2</sup> located in the southern part of the Icelandic Highlands. A questionnaire survey was handed out in Landmannalaugar in the summers of 2000 and 2009 by two interviewers, who stayed in the area for a week during the high season of tourism. Questionnaires were in English, German, French and Icelandic. Completed questionnaires were received from 546 guests in the year 2000 and 1105 in 2009. The data was analysed with the help of the statistics software SPSS. Descriptive statistics are used to present the data. In the questions related to visitor's attitudes a five point Likert-scale is used, and t-tests and chi-square tests are used to test whether there is a significant difference between the two years.

The main conclusion of the study is that in 2000 20% of the visitors experienced that there were too many tourists in the area but in 2009 this had increased to one third of the visitors. The area now appeals to visitors characterised by less puristic attitudes than before as the proportion of purists has declined from 29% in 2000 to 20% in 2009. At the same time, many visitors are very satisfied with Landmannalaugar. The place is a symbol of wilderness in many people's minds and they value it and use it to gain a wilderness experience.

Planning tourism in a wilderness area is a complex issue, as tourism inevitable changes the area. To provide recreation opportunities in a wilderness area like Landmannalaugar is a complex issue, as pluralism exists in values and interests and there are conflicts of opinion about the development of tourist facilities. When finding the appropriate use level it is, though, not enough to identify the main target group at a destination and find what the visitors consider to be acceptable change. As Butler (1997: 18) points out:

Adopting an approach which relies on identifying what users regard as acceptable change, and basing usage levels on user norms and expectations can only result in increasing levels of use and development as those users concerned by development and increasing numbers will go elsewhere and will be replaced by those with higher use threshold levels.

Therefore, many destinations would exceed their appropriate use level and would not be able to maintain themselves at existing levels of quality and thereby not be sustainable.

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## ORGANIZED SESSION: ORAL

# Recent advances in visitor monitoring: GPS tracking and GIS technology

Session organizer: **Isabelle Wolf**, NSW National Parks and Wildlife Service, Australia,  
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Recent advances in the monitoring of visitors and their infrastructure include the implementation of GPS tracking and GIS technology. This technology is used to capture data on the spatio-temporal behaviour of visitors in a level of detail and reliability that is unprecedented via conventional visitor monitoring techniques. A variety of devices is available for tracking visitors including standard handheld or wristband GPS units as well as GPS tracking apps in mobile phones. GPS tracking and GIS technology pose new challenges for the researcher. These include the choice of the most effective and accurate GPS tracking device, the most appropriate analytical procedure ranging from simple visual exploration to sophisticated spatial analysis, and the optimal data management and processing of massive datasets. The technology can be integrated into both an observational and experimental context in urban as well as natural recreation settings. For example, it has been used to examine general patterns in the spatio-temporal behaviour of visitors to cities and national parks, and the effectiveness of visitor management actions to increase visitor compliance or enhance visitor interpretation. It provides practical information on the small to large scale movements of visitors within and between visitor sites, travel preferences and sequences, and the variation in the visitor usage intensity in relation to visitor characteristics such as demographics, travel motivations, activities, and management actions as well as landscape characteristics and features such as terrain, natural attractions and visitor infrastructure. The latter itself can be subjected to GIS analysis to inform modelling approaches to travel route planning and management of park facilities. This information guides decision-making by park agencies and other tourism professionals on the extent to which visitor movements behave in a predictable and desirable way, the extent to which changes in visitor management have the desired effect, and on the monitoring of social and environmental impacts in relation to visitor usage patterns.

# Integrating geospatial technology with behavior mapping method in monitoring visitor use in open landscapes

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## Introduction

Open landscapes like meadows, dunes, beaches and urban natural areas are valued resources that serve as vital plant and wildlife habitats as well as spaces for diverse visitor activities. These resources are subject to a variety of ecological pressures exacerbated by anthropogenic threats, including intense visitor use and the resulting biophysical impacts to flora and fauna. Informal trails are a common and growing impact issue in protected areas due to the unmanaged and proliferating nature of this problem. Defined as identifiable pathways outside of a protected area's formal trail system (Leung et al. 2002), managing informal trail impacts requires timely information on the character of visitor use and trail impacts. Quantitative and spatial data on the location, intensity, and nature of visitor use can alert managers to potential resource or experiential impacts and guide future management action.

## Method

Multiple points of visitor access and limited or no containment infrastructure common in open landscapes present unique monitoring challenges for protected area managers seeking to obtain visitor use data. To address these concerns, we implemented a field monitoring method that integrated geospatial technology with an established observation method known as behavior mapping to characterize spatial patterns of visitor use in open landscapes. Behavior mapping entails a systematic scan to record the location of individuals and observable attribute data within identified target areas. A PC-based tablet computer running ESRI ArcPad 7 was employed to map visitor locations directly into shapefiles with pull-down menu in which pre-coded visitor attributes, including gender, age group and activity type, were recorded.

## Study Location

Researchers from North Carolina State University, USA, applied the behavior mapping method to three high-use meadows in Yosemite National Park, California, USA, in the summer of 2011. Yosemite National Park, a UNESCO World Heritage site, was the third most visited national park in the United States' National Park Service (NPS) in 2011 (NPS, 2012). Meadows are an integral component to the ecosystem and visitor experience in Yosemite National Park and comprise 85 sq. km. of the park's 3,026 sq. km. The United States' National Park Service (NPS) routinely monitors several aspects of meadow health and resource condition in select meadows, including informal trail proliferation in the meadows chosen for behavior mapping.

## Findings and Discussion

### *Accuracy and Reliability*

Prior to data collection and analysis, researchers assessed accuracy and inter-observer reliability. A trained observer mapped a second researcher on the base map, while the second researcher collected GPS waypoints. A comparison of 22 matched points established an 11.32 m margin of error. A percent agreement method comparing independent collected observable attribute data for three observers examined inter-observer reliability. Percent agreements fell within acceptable ranges at 82.4% for activity category, 86.8% for age category, and 88.2% for gender.

### *Visitor Use*

The descriptive data generated from the behavior mapping method offered a snapshot of visitor demographics and activity. A total of 108 behavior mapping scans were conducted during the summer of 2011, resulting in 1,507 visitor use points. The number of visitors recorded was roughly equal across the three meadows. Overall, a slight majority of visitors were male (53.9%), visitors were more often engaged in active activity (e.g., biking, walking, running) and visitor use was greatest between noon and 16:00.

Several spatial analysis tools available in GIS software examined the concentration of visitor use as well as the spatial association of use with respect to informal trails. Across all three meadows in this study, visitor use was highly concentrated at statically significant levels ( $p = .0001$ ). Kernel density maps, a graphic representation of density using a kernel density equation, illustrated areas of intense visitor use. In one study meadow, El Capitan Meadow, the kernel density map indicated concentrated visitor use along the northern and eastern boundaries of the meadow, as well as moderate use of informal trails (figure 1).

### *Visitor Use of Informal Trails*

The utility of the visitor use data also extends to other spatial data sets. When compared to informal trail data, an independent t-test found a statistically significant difference ( $p = .000$ ) between distance visitors were observed from informal trails and activity category (i.e., stationary, active). Stationary activities, such as standing or photography, occurred further from the informal trail corridor ( $M = 5.52$  m,  $SD = 8.29$ ) than active activities ( $M = 2.40$  m,  $SD = 2.63$  m). However, a one-way ANOVA found no statistically significant relationship between informal trail condition class (i.e., barren, some bare ground, stunted vegetation) and distance visitors were observed from trail ( $F = 1.145$ ,  $p = .319$ ).

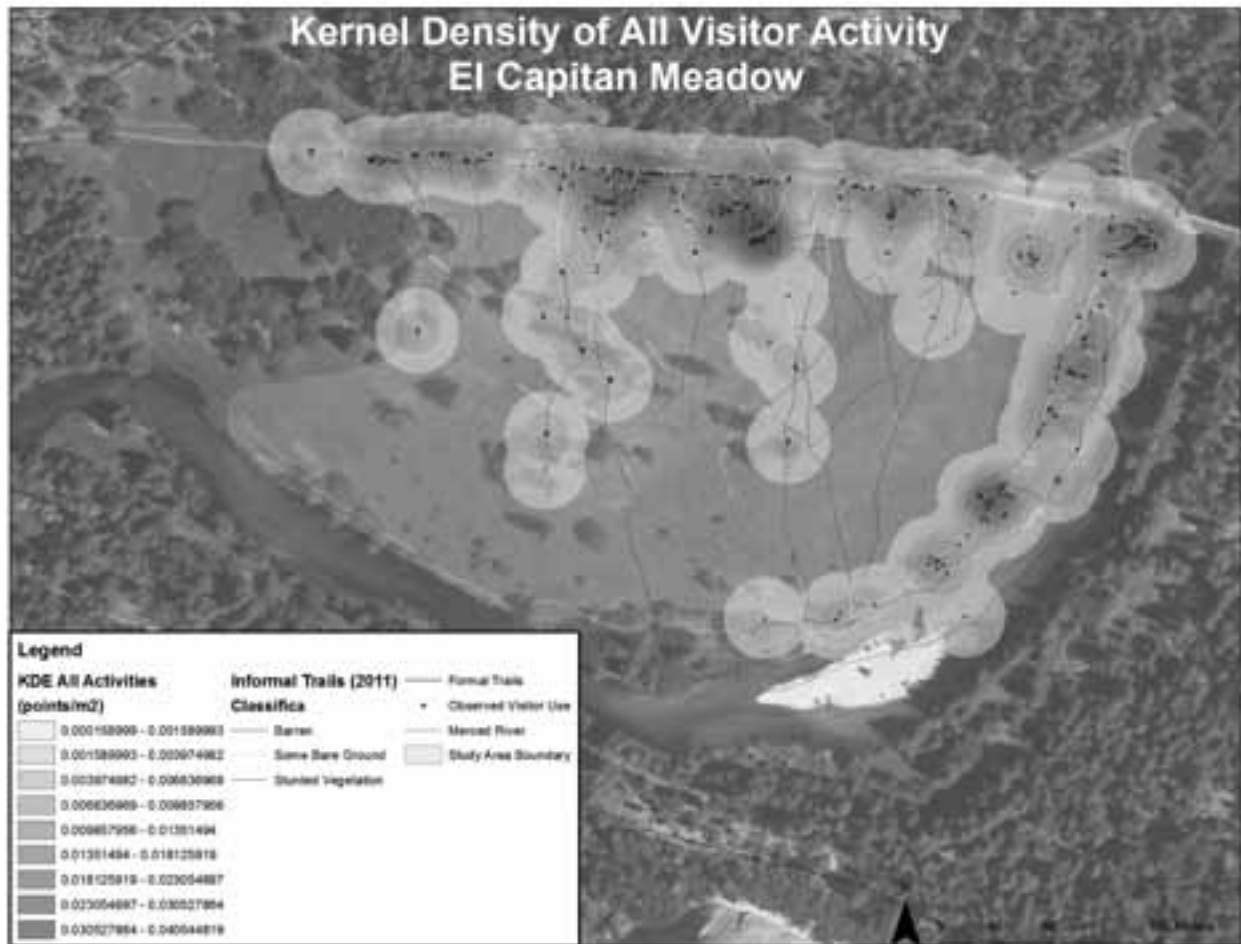


Figure 1. Kernel density map of El Capitan Meadow illustrating intense visitor use along the northern and eastern borders.

## Conclusions

The behavior mapping method proved adaptable to the open landscape as well as an acceptably accurate method to monitor visitor use of open landscapes. Researchers chose observation locations that allowed for complementary views of the scanning area that also lessened the opportunity for visitor interaction. However, distance from use and vegetation height may have influenced accuracy. The accuracy level found in this study may be acceptable for visitor management purposes, however further consideration is warranted for integration with other spatial data layers. Areas with dense informal trail networks may consider subdividing the study area to increase accuracy or employing a complementary method.

A major consideration and benefit to behavior mapping is the ability to implement the method with a wide variety of individuals, including volunteers. A paper-and-pencil version of the method allowed volunteers to collect longitudinal data in two of the three study meadows for examination of seasonal variation in visitor use. Open source software and advances in mobile technologies may reduce

material cost and increase the efficiency of behavior mapping with volunteers while reducing the time pressure to protected area staff and providing an opportunity for stewardship education.

Behavior mapping may also prove effective in other protected areas with open landscapes, like beaches or dunes, experiencing visitor pressures. Unlike questionnaires or visitor-carried GPS studies, behavior mapping does not require participation from the visitor and therefore may lessen the influence on behavior or impact on visitor experience. Resulting descriptive and spatial data can aid management in identifying areas of intense visitor use, help inform trail maintenance or surface hardening plans, or support restoration efforts.

# Using a mixed-methods approach to explore the human dimension of Willmore Wilderness Park, Alberta, Canada

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The management of a protected area involves more than just management of ecological aspects; it also requires managing the *people*. Understanding the human-dimension component of park management can be critical for achieving conservation-based targets and objectives. “An understanding of the amount, character, and distribution of recreational users is essential to wilderness management because such use is the cause of many impacts, the source of many wilderness values and potential funding” (Hendee and Dawson, 2002, pp.369). Unfortunately, it is often a challenge to gather visitor information and to learn about trends related to the characteristics, activities, and preferences of visitors to wilderness and other natural areas (Dvorak et al., 2012).

There have been few studies that have focused on park visitors in provincial wilderness areas within Alberta, Canada. Historical existing user-profile data collected for Willmore Wilderness Park are sparse and out-of-date and, due to the park’s physical remoteness, there have been few attempts to gather relevant information of this kind. As such, visitor information for Willmore Wilderness Park has been identified by park managers as an important knowledge gap in park management. Willmore Wilderness Park is approximately 4600 km<sup>2</sup> and is Alberta’s largest wilderness provincial park. It was created in 1959 (officially named in 1965) and is located in the Rocky Mountains straddling the Alberta and British Columbia provincial border. It lies adjacent to Jasper National Park which is a member of the UNESCO Rocky Mountain World Heritage Site (Figure 1). Willmore is considered to be a benchmark for protected, undeveloped, intact ecosystems in west-central Alberta (Fisher et al. 2011). Willmore Wilderness consists of rugged, remote, and extensive natural landscapes capable of providing rare and unique wilderness experiences and a wide array of recreational activities. It is popular both recreationally and politically, so a solid evidence-based management plan is required that is based on sound visitor information.

The purpose of this study is to address the need for acquiring an improved understanding of visitor use in Willmore Wilderness Park. Specifically, this study will examine the demographics, trip patterns, motivations, park management preferences, knowledge about the park, and the sense-of-place relationship of visitors to Willmore. This project utilizes a mixed-methods approach including: trail surveys, in-depth mail surveys, trail cameras, Global Positioning System (GPS) tracksticks, and in-person/telephone semi-structured interviews. Trail surveys were distributed through trailhead kiosks, local visitor information centers and through the Internet. In-depth surveys were mailed out to users who provided their contact information on the trail surveys. Visitor characteristics and visit informa-

tion were acquired by placing trail cameras (Reconyx PC) at the main trail entrance at each of the four staging areas into Willmore (on the Alberta side). GPS tracksticks were deployed to capture satellite-based route information about users and to also test their practicality within a wilderness setting. Lastly, a series of semi-structured questions, either through the telephone or in-person, were posed to park users in an in-depth interview that focused on sense of place. Interview participants were selected through a snowball sampling technique.

The fundamental research questions include the following and mainly focus on park visitors using the four main Alberta staging areas for Willmore:

1. What is the visitation level in Willmore Wilderness Park?
2. What are the visitor characteristics, motivations, level of knowledge of the park, and park management preferences of Willmore users?
3. What are the spatial patterns of visitor use?
4. What are the trip characteristics and the main activities of Willmore users?
5. What is the relationship and sense-of-place between visitors and the park?

By understanding more about users and what they prefer or desire in Willmore, this project will help balance conservation with recreation objectives. The information, summaries, figures, and conclusions from this work will be suitable to integrate directly into a Willmore Park management plan. In addition, the use of emerging technologies such as trail cameras and GPS for use in visitor monitoring is a relatively new approach in Alberta’s provincial parks. This project is an excellent opportunity to help understand the utility of these emerging instruments and how they could be applied on a more provincial level to attain visitor characteristics and information.

This presentation will review preliminary results gathered from the project study instruments. Project results related to the main research questions will be discussed with a focus on Global Positioning System (GPS) tracksticks and the utilization of Geographic Information Systems (GIS). Specifically, the effectiveness, benefits, and challenges of utilizing GPS tracksticks as a study instrument to utilize for visitor monitoring in Willmore and other Alberta Parks will be explored.



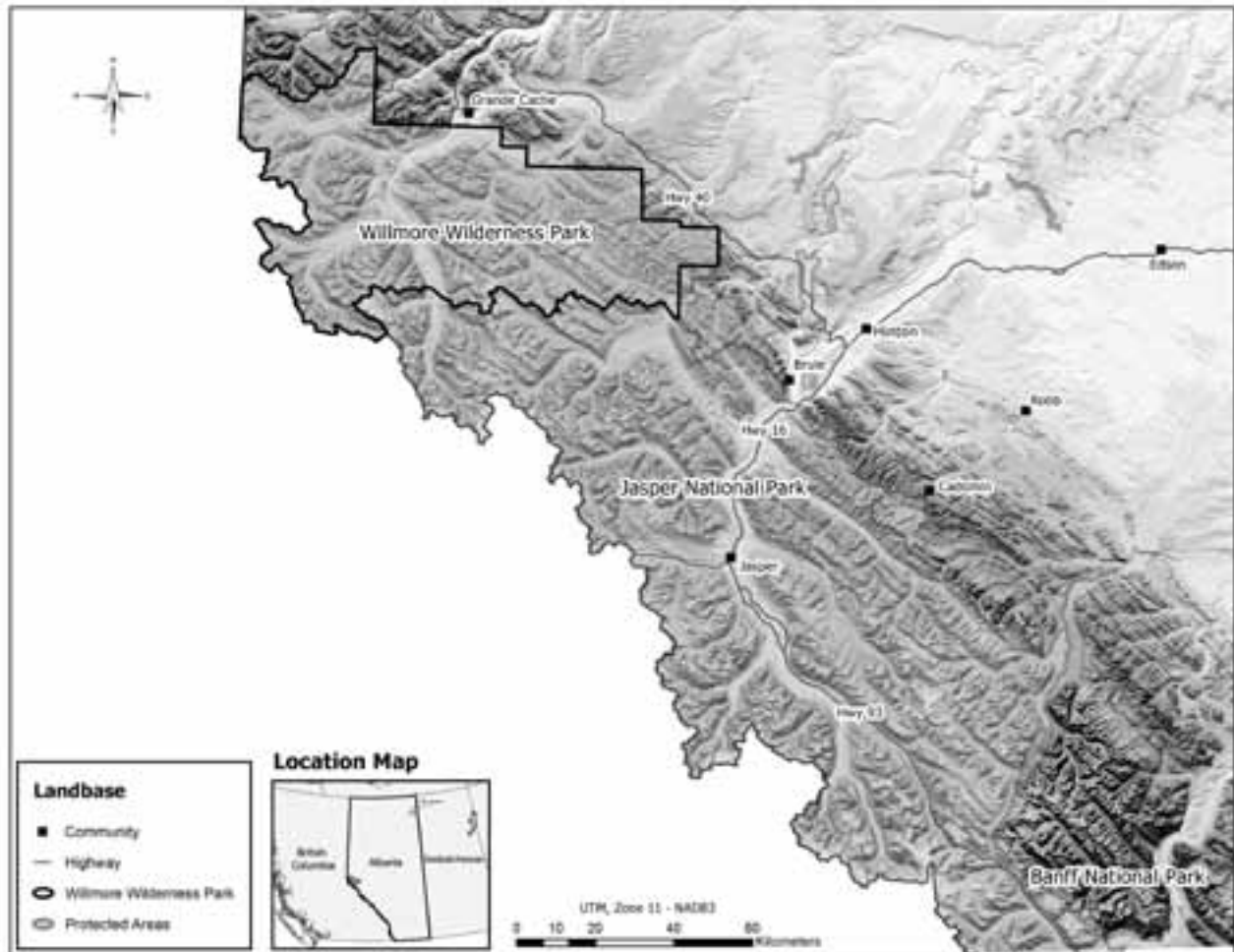


Figure 1. Study Area, Willmore Wilderness Park, Alberta, Canada.

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# The implementation of GPS tracking and GIS technology for park visitor monitoring: a key to managing visitor assets and experiences

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## Introduction

To achieve visitor satisfaction, park management needs to provide a range of recreational opportunities and ensure that these are resourced with an appropriate level of facilities. However, due to budget constraints, managers are required to target resources in relation to visitor needs and preferences. Visitor use of protected areas varies with the popularity of sites and specific assets within sites. Given this local-scale variation in usage, precise visitor monitoring methods are required to assess whether the provision and maintenance of facilities matches recreational demands.

We employed GPS tracking and GIS technology in combination with questionnaire-based surveys to monitor visitors in selected national parks within the Sydney Metropolitan area in Australia. The project consisted of two components: (1) An observational study in which we examined how visitor usage of assets varies with type of visitor activity. (2) An experimental study in which we examined how the provision of various interpretive media, affects the spatio-temporal behaviour of visitors along a scenic walk.

## Visitor asset management (1)

In many protected areas worldwide, park agencies need to manage the provision and maintenance of a wide range of visitor assets to accommodate visitor needs and expectations. These facilities encompass a broad range of infrastructure such as benches, picnic tables, barbecues, walking tracks, roads, parking lots and entire visitor precincts. Facilities that maintain the natural and cultural values of a park and provide a high quality of service are integral to visitor satisfaction. Close alignment of supply and demand will ensure cost-effective management of such facilities whilst reducing unnecessary development with unwanted facilities.

The aims of this study were to determine how demand for visitor facilities depends on their intrinsic characteristics, and their relationship with other site features and with visitor attributes. We also used this study to evaluate the performance of our methodological approach.

## Methods

Demand for visitor facilities has been traditionally determined by questionnaire-based surveys. However, surveys tend to generate demand data on a coarse spatial scale as the data collected are typically tempered by the memory of visitors and their ability to reference their movements on a map (Wolf et al., 2012a). We capitalised on recent advances in visitor monitoring and used GPS tracking (Shoval and Isaacson, 2010) to determine demand for facilities. Ques-

tionnaire-based surveys complemented the GPS tracking and both were analysed in conjunction with the New South Wales National Parks Service's comprehensive visitor asset management database.

## Preliminary Results

According to preliminary results, demand for point assets, such as tables and seating, was strongly influenced by their spatial relationship with other assets. This included proximity to barbecues, parking lots, playgrounds, toilets and garbage bins. Whilst the former three attracted or repelled visitors depending on their primary motivation to visit, the latter two repelled visitors universally. Natural landscape features that increased the appeal of point assets included scenic views, trees and proximity to water.

Asset type was another predictor for demand. For instance, open picnic tables were more popular than pavilion-style sheltered picnic tables. Shelters containing numerous picnic tables, along with other facilities, were popular among larger visitor groups and families but repelled others. In contrast, asset condition was of minor importance presumably because the overall level of asset maintenance was high.

A limited number of point assets attracted significant numbers of visitors while some were seldom visited. Regular visitors were very loyal to specific point assets. Interestingly, first-time visitors frequented park information centres less than expected. Follow-up surveys indicated that a considerable number of visitors missed two of the centres due to lack of signage and the inconvenient location of one of the centres away from the major visitor precinct.

## Interpretive media (2)

In addition to the provision of facilities, effective interpretation is another important tool for park managers to attract visitors and enhance their experiences. Although, advances in technology have expanded the range of interpretive media available, their effectiveness in nature-based settings has not been well established. In this study we used GPS tracking and GIS analysis to compare the performance of modern technical media with traditional media along a scenic walking track in a national park in Sydney (Wolf et al., 2012b).

## Methods

Participants were provided with one of two types of modern media: (1) an MP3 player (audio tour), (2) a GPS-triggered multi-media tour; or with one of four types of traditional

media: (1) text-rich or (2) image-rich pamphlets, or (3) text-rich or (4) image-rich signs. The media were evaluated by measurement of their relative attracting, distracting (number of detours that people take to access sights) and holding power via GPS tracking of visitors and GIS analysis. These measurements were accompanied by a questionnaire-based survey to assess visitor satisfaction with the media, willingness to give word-of-mouth recommendations and short-term factual learning.

### Results

The GPS navigation tour performed well compared to traditional media, achieving an intermediate attracting power, highest distracting power and highest holding power. It was also rated more highly than the audio tour for overall experience with the medium and for facilitating fun. Further, visitors were more willing to provide word-of-mouth recommendation for the GPS navigation tour than the audio tour. Both modern media achieved the highest satisfaction ratings for discovery and learning and were most efficient at facilitating factual learning. Traditional media were considered most conducive to socialising and relaxation and were more consistent with a nature-based experience. Signage outperformed pamphlets on most performance measures.

### Conclusions

Both studies exemplify how the implementation of GPS tracking and GIS technology was crucial in determining the ways that local park management should manage existing visitor assets and the types of assets and experiences that should be provided in the future. Our methodology was suitable for identifying small differences in the attracting and holding power of visitor assets and experiences, which are exceedingly difficult to capture with traditional visitor monitoring techniques. Analysing fine-scale spatial data of visitor movements in light of traditional criteria, such as visitor satisfaction, enabled a more comprehensive assessment of the performance of visitor assets and experiences. Hence, we recommend that the GPS tracking of visitors be embedded in a mixed-method approach using questionnaire-based surveys, analysis of visitor asset databases and field verification of visitor behaviour. Whilst the former detects differences in the usage of assets, the latter may ascertain the underlying reasons.

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# GPS-based data collection and analysis methods for better management of recreational areas

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## Introduction

Recent technological advances, such as Global Positioning System (GPS) and its wide availability can contribute to a better understanding of visitors' behaviour in recreational areas and effectively support management of those sites (Gimblett and Skov-Petersen, 2008; Taczanowska et al. 2008, Shoval and Isaacson, 2007). In this paper we give an overview of methods concerning GPS data collection, analysis and visualisation. However, the spatio-temporal data alone does not provide a fully comprehensive description of the visitors' behaviour. Therefore, the focus of this paper is to present several possibilities of integrating spatio-temporal data with additional information about recreationists. The combination of methods can be used in different thematic contexts and provide a better basis for management decisions.

## Methods & results

GPS data (N=534 GPS tracks) were collected in the suburban leisure sites of the city of Vienna, Austria within the framework of three research projects: BALANCE (ASAP, 2008), I AM HERE! (Schauppenlehner et al., 2012), and CARDIO-GPS (Taczanowska et al., 2012). The projects implemented different data collection strategies ranging from a large-scale on-site data collection campaign (GPS-tracking combined with structured questionnaires) up to in-depth studies focused on a smaller number of selected individuals (GPS-tracking combined with a qualitative study on public space; GPS-tracking combined with measurements of human physical activity).

Several analytical tools have been used in order to investigate the visitors' spatial behaviour at individual and collective levels. The analysis at individual level focused on the characteristics of trip itineraries, such as route length, trip duration, velocity of movement, as well as number and duration of stops. The properties of trips, based on the GPS data, were calculated in ArcGIS, BALANCE (prototype of analytical software) and Matlab. Analyses at a collective level refer to the overall distribution of recreationists within a leisure site. In order to better understand the spatio-temporal dynamics of daily recreational use ArcGIS modules such as Spatial Analyst (density analysis) and Tracking Analyst were used. The same tool has been used to analyse the density of stops in order to identify the significance of resting places in the investigated leisure site. Table 1 gives an overview of methodological approaches used to collect and analyse GPS data in three different research projects.

## Discussion and Conclusions

The reported experience with a broad spectrum of data can contribute to the on-going discussion on the value of GPS tracking for management of recreational areas. GPS-based data collection and analysis are suitable for those, who are interested in a high-resolution spatio-temporal characteristic of visitors. Such information can be used in different ways to support specific management situations. In this paper we have presented the methodologies of three recent studies dealing with GPS-tracking in outdoor leisure sites.

GPS-tracking can be successfully applied in quantitative as well as qualitative research approaches. Current technological advances and better availability of GPS allow collecting larger samples of spatio-temporal data. Different types of GPS-based devices offer more flexibility in the design of data collection process. In the presented studies, next to typically used outdoor GPS devices (Garmin eTrex), other methods such as GPS equipped PDAs (Personal Digital Assistant) or smart t-shirts with integrated GPS and other sensors were used. In future, smart-phone applications could be very interesting from the GPS-data collection perspective. Linking GPS-tracking with other methodologies delivering data about physiological, demographic, psychographic and behavioural characteristics of recreationists are necessary to provide a more complete description of leisure activities. According to our experience, the most effective approach, in terms of collecting large samples of data, was using typical GPS devices and structured questionnaires. However, qualitative methods such as the participatory multiple media approach applied in I AM HERE project, gave more comprehensive insights into understanding the driving forces of recreational behavior.

In our work we stress the importance of Geographic Information Systems (GIS) as a useful tool supporting spatio-temporal analysis of the collected GPS data. Common applications such as Google Earth can be used to have a general view of the collected GPS tracks or other geo-tagged information. However, for more detailed analysis professional tools such as ArcGIS or other dedicated applications are necessary. In case of large samples of the collected GPS tracks one can face data processing problems. In the presented studies application of standard software (ArcGIS 9.3) was possible.

Finally, GPS-tracking is an increasingly promising data collection method. There is a need for further development of data processing, analyses and visualization methods. On the one hand, detailed spatio-temporal information can be

Table I. Overview of methodological approaches and tools used to collect and analyse GPS data. Summary by three different research projects.

	BALANCE	I AM HERE!	CARDIO-GPS
Objective of the project	Creating a prototype of the BALANCE IT-system for guiding visitors and at the same time collecting and analysing visitors' behaviour	Understanding recreational behaviour of adolescents in urban public space	Measuring human physical activity during hiking
Research approach	Quantitative approach	Qualitative approach	Quantitative approach (pilot study)
Target group	Hikers	Adolescents (high school students)	Healthy hikers (students of the sport university)
Study area	Lobau, Austria	City of Vienna, Austria	Wienerwald; Lobau, Austria
Data collection methods (GPS)	GPS devices (Garmin eTrex) Mobile Guides (PDA with GPS chip)	GPS devices (Garmin eTrex)	Smart t-shirts (built-in sensors, e.g. GPS chip)
Data collection methods (additional information)	Structured questionnaires	Participatory multiple media approach (photography, video, audio and analogue documentation)	Smart t-shirts (built-in sensors measuring human physical activity)
Data analysis tools (GPS)	ArcGIS BALANCE IT-system	ArcGIS Google Earth	Matlab
Data analysis tools (linkage of GPS data with additional information)	ArcGIS BALANCE IT-system SPSS	Google Earth Webapplications	ArcGIS Matlab
Data visualisation (GPS)	ArcGIS BALANCE IT-system	ArcGIS Google Earth	ArcGIS Google Earth

used for monitoring and planning of recreational areas, on the other one it can be offered to visitors itself. This bilateral interest in GPS-based data should be further investigated and eventually considered in planning future visitor monitoring campaigns.

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# Developing parameters for agent-based models using choice experiments

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## Introduction

Outdoor activities are increasing as a balance to a stressful business life and urban habitation. Especially in sensitive areas in the Alps the resulting pressure on nature and wildlife is increasing (Lamprecht et al., 2008). To avoid serious damages to nature and wildlife new planning instruments are needed. Agent-based models (ABM) are regarded as one such planning tool, to simulate the behavior of artificial recreationists or wildlife on a platform of infrastructures such as topography, land cover, trail network, etc. Such recreationists and wildlife are programmed as self-acting agents who behave according to certain rules. Thus ABMs serve as tools to study spatial behavior of recreationists and to estimate changes in recreation-wildlife-systems in anticipated future scenarios (Hunt et al., 2010). The challenge of “how to detect parameters for human agents” remains. This article is based on a case study of mountain bikers.

## Framework mafreina

In the summer framework of the mafreina project – management-toolkit recreation and wildlife – the focus is on hiking and mountain biking in mountainous regions in the Swiss Alps. (First results of winter situation were published by Rupf et al. (2011).) Skov-Petersen (2005) suggests to develop rules for human agents based on a combination of revealed preference data (e.g. GPS-tracking) and stated preference data (e.g. choice experiments). Choice experiments (CE) are based on a theory of human behavior (i.e. random utility theory). In a CE at least two situations are provided to respondents who must choose the preferred one (see Figure 1). Hunt et al. (2007) applied an ABM based on a choice model of revealed preference data. With the integration of animal agents in the mafreina framework shortcomings of Hunts model could be improved.

## Developing rules of mountain biker agents

In general, mountain biking agents need two different sets of rules, first about the selection of geographic entry points into the system and suitable routes, and second about the agents' behavior on their trips. During a GPS-tracking campaign among 159 mountain bikers 247 different trips were recorded. The analysis with a geographical information system (GIS) of the tracking data delivered diverse information about trips: distance, duration, altitude, start and end positions, etc. That information constituted the main source of information for defining the range of attribute levels for the CE of tours (see Figure 1) as well as the “Trail choice at a junction”.

The first choice experiment was designed to present tour

choices to the respondents. Because the duration of the actually tracked mountain bike trips showed a bimodal distribution (peak 1 at 1 to 2 hours and peak 2 at 4 to 5 hours), the decision was made to develop two different tour choice experiments for short and long trips. From the mountain biking literature (e.g. Morey et al., 2002) and interviews with experts, a total of 14 attributes for mountain bikers were integrated in the choice experiment which presented a challenge for succinct presentation; therefore nine variables were visualized in a route profile. With the additional five attributes (excluding “estimated time”, which was calculated as a function of distance and altitude) the response task was feasible and quite enjoyable.

The second choice experiment dealt with the situation at a trail junction, once biking along the route. Here, for each hypothetical situation the respondent had to choose between two hypothetical trail sections, which were characterized with eight attributes, such as trail surface, slope, forest cover or crowding. Together with the answers to the other survey questions, e.g. about their habits, trip planning, and environmental interests, the results of the two choice experiments allowed the definition of the different agent types of mountain bikers.

Each CE was based on an orthogonal fractional factorial designs with 64 choice sets. In the visualization process of the tour choice experiment few corrections were needed. Consequently the statistical designs of the two tour choice experiments had to be adapted slightly and the analysis of short and long tour choice had to be done separately.

After data cleaning 126 short tour bikers and 191 long tour bikers remained for analysis. For the simple analysis we assumed that beside trip distance, time and altitude, the overall interests of the short and long tour bikers are quite similar. The crowding issue seems to be a major concern, especially the encounters with hiking groups. More tolerance is shown to other bikers. Another attribute of great importance is a good view, and the bikers like to be in higher altitude. But cable cars are refused by most bikers.

So far in general no differences between short and long tour bikers could be detected in their stated behavior at a junction. Significant trail attributes for bikers (Latent Gold, Wald-Test,  $\alpha = 0.05$ ) were:

- Trail type (highest ratings: single trails)
- Steepness (highest ratings: moderate)
- Numbers of hiking groups
- Rest infrastructure (highest ratings: hut selling alp products)
- Trail signalization (as good as possible)
- Closed trails

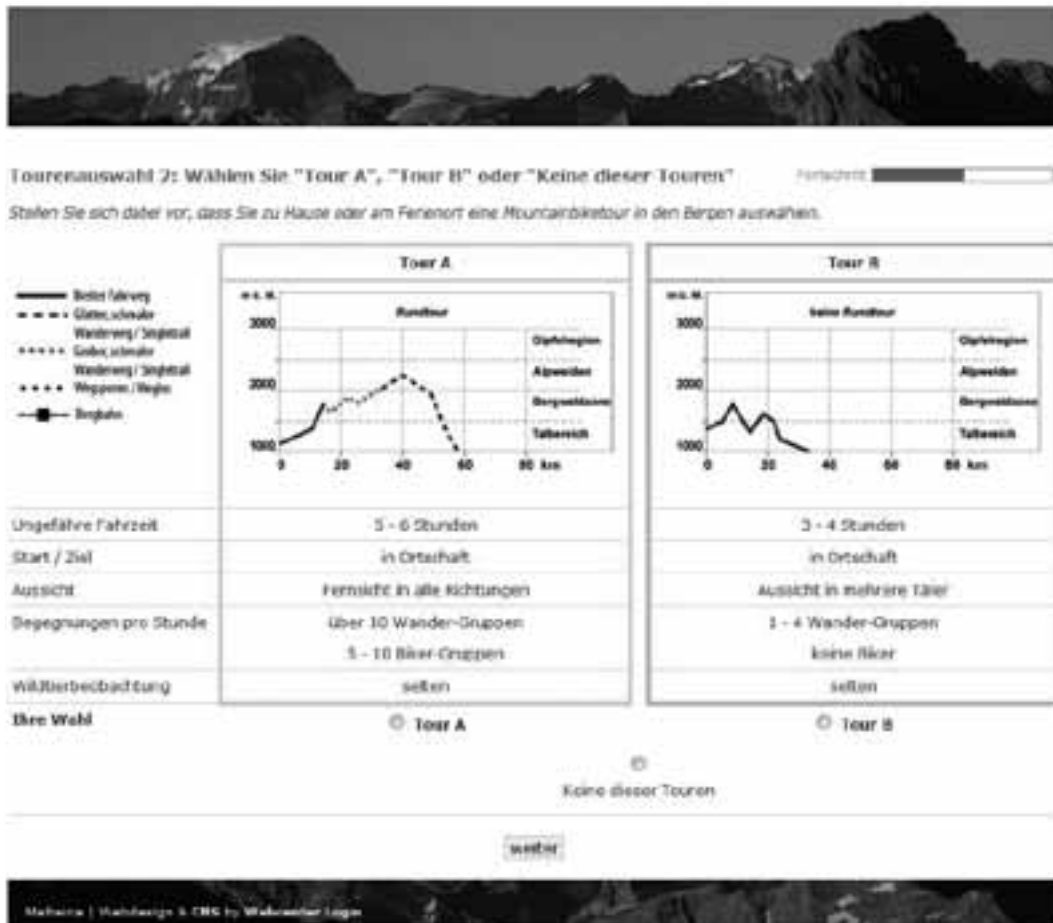


Figure 1. Choice experiment for a mountain biking tour – respondents had to choose “Tour A”, “Tour B” or “None of those tours”. The presented attributes described the tour as profile, roundtrip or not, its estimated duration, start/end in a village, view, encounters per hour (hiking groups and mountain biking groups) and chance to watch wildlife.

No significance occurred for time difference (little bit longer or shorter), proportion of forest and number of other mountain bike groups.

## Conclusion

So far the first experiences and findings with the process GPS-tracking and GIS-analysis as base for the CE are positive as it guided the design of the CE into the right direction. It will provide a suitable rule set for the ABM. Further analysis will lead to the identification of additional subgroups and agents (Morey et al., 2002) which will be the next steps in the project mafreina.

## Acknowledgements

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# Revealing recreational behaviour and preferences from GPS recordings

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## Introduction

The mafreina project (Management Toolkit Freizeit und Natur: [www.mafreina.ch](http://www.mafreina.ch)) is conducted in the Biosfera Val Müstair. As part of the project a vast amount of GPS track were recorded, including 550 winter and 1100 summer trips. Automatic visitor counters and automatic sensor cameras supported the recordings. Further, additional information – including main activity during the tour and familiarity with the areas – was collected by means of questionnaires.

Beyond basic analysis of tour length and duration, average speed, etc., the main focus of the presentation is on analysis of more detailed aspects of the visitors' behaviour. The analysis' includes:

- Analysis of 'stops' (i.e. location where the subject had a break)
- Analysis of activity type (mainly distinction of hikes, mountain bikes, skiers, and snowshoers)
- Relation of slope and speed (for different activity types)
- Probabilities of selecting destinations from given entry points
- Tour distribution over land cover, elevation and gradient classes

Finally the presentation demonstrates how GPS tracking data can be analysed to provide visitors preferences and route choice behaviour. By means of logistic regression of the routes subjects actually took vs. possible alternatives (within a given max additional time/distance limit) the significant, sign and estimated influence of characteristics of the path network can be revealed.

## Analysis of 50 tracks

A subset of 50 subjects for the summer of 2010 was selected for the present analysis of the relation between slope and speed. The sampled comprise 127.955 point in total. The tracks were broken up into subtracks (routes taken between locations of pauses). In total the data set comprise 243 subtracks of an average length/duration of 7.5km/98.4 minutes). On average the subtracks had an elevation difference (difference of min and max altitude along the subtrack) of 266 m. For analysis of elevations (and slope) a 25x25m Digital Elevation Model (DEM) was applied. The dataset include both hikers and mountainbikers.

In a mountainous terrain – like the present case study area- it is intuitively expected that there is a relation between a subjects' speed and the local slope of the path. That is, speed will be higher when moving downhill than uphill. Further it could be expected that mountainbikers' speed

would be more influence by slope than hikers. The same would be expected for winter activities (which is not part of the present analysis) – i.e. skiers' speed would be more affected by slope than snowshoers'.

In figure 1 the resulting relation between subjects' average speed and slope is shown. The relation was analysed by means of simple linear regression. The displayed results are based on respondents' entire tracks (i.e. not subtracks between stops). The reason for this is that subtracks often goes up to a location at a higher elevation where a stop is made, and then back. Accordingly the diversity of slopes for a single subtrack would be relatively small (i.e. primarily positive or negative), which would jeopardize the explaining power of the regression analysis.

The resolution of the applied DEM – 25x25 m – was often larger than the resolution of the GPS recordings (distance between points). The revealed slope (difference in elevation divided by distance between two consecutive points) would frequently be 0. Accordingly the applied algorithm was set up to look for the distance/elevation differences of points along the track being minimum 100m apart.

In general the explaining power ( $R^2$ ) ranges from 27% to 0%. As expected by inspection of the beta-values, the explaining power is generally higher for higher speeds than for lower. Further, it must be concluded that an individuals' speed in influenced by more factors than slope.

The results displayed in figure 1 support the proposed hypothesis: there seems to be a relation between slope and speed – the steeper the slops downhill, the higher the speed. Further it appears that the group of respondents at relatively low average speeds (around 4 km/h) has a lower tendency (if any) of influence of slope. Intuitively these 'slow respondents' are expected to be hikers – the faster are bikers. Yet again, this support the second hypothesis – that hikers are less vulnerable than slope than bikers. The chart (fig. 1) indicates that there are two types of bikes (high-speed respondents'. One strain at relatively low speed (average speed of 6-9 km/h), being highly influenced by slope and one slightly faster (9-11 km/h) being less influenced. This could indicate two types of bikes with different levels of shape and technical skill. In general it appears that the faster the mountainbikes are, the less slope influences their speed.

As mentioned above, the relation between slope and speed for subtracks would be expected to be less prominent as for the entire tracks. Tests and plots (not included) supported this expectation.

More work has to be conducted to compare the finding of the analysis with the recording made in field of the respondent's actual activities.



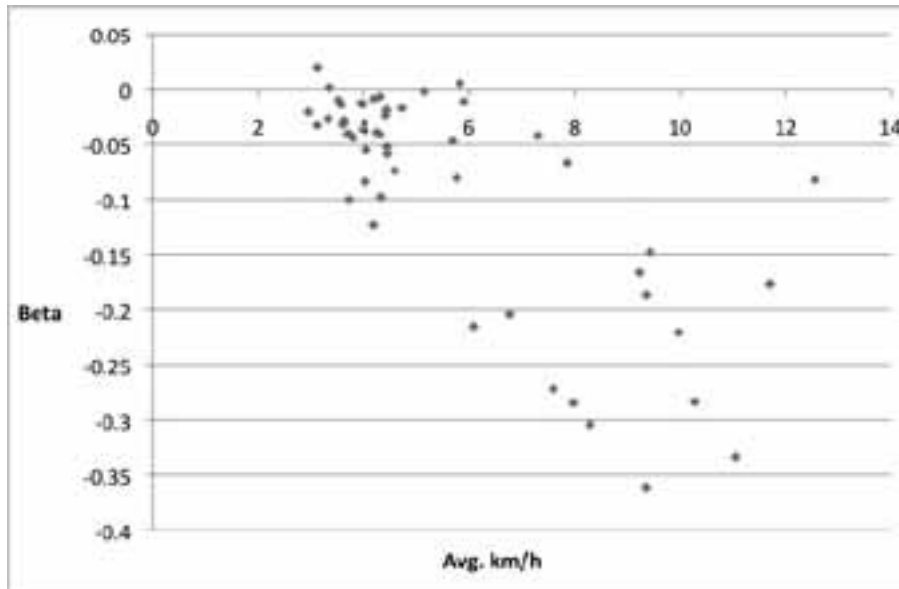


Figure 1. Relation between subjects' average speed and relation of speed and slope (n=50). The relation is expressed as the beta parameter of a linear regression of speed and slope of points recorded along the track(s) of individual subjects.

## Extro

The results provide insights in visitors activities, preferences and behaviour. Further, the results can be applied as parameters to an Agent Based Model of the case area. Such parameters include: visitors' speed, speed/slope relations, destination choice, off-piste activities, and route choice behaviour. The presentation will conclude by provision of examples of application of such parameters to an ABM.



## ORGANIZED SESSION:WORKSHOP

## Sustainable tourism in Sweden's protected areas

Session organizer: **Ulrika Karlsson** and **Ingvar Jundén**, Swedish environmental protection agency, [ulrika.karlsson@naturvardsverket.se](mailto:ulrika.karlsson@naturvardsverket.se)

This workshop includes a presentation how authorities in Sweden are working with tourism in protected areas, combining the aim to secure environmental values while managing these areas for tourism. The presentation also covers a brief introduction to the bill “Outdoor recreation for the future” which includes the national objectives for outdoor recreation.

Sweden has a long tradition of protecting nature and culture from unsustainable use by means of both regulating practices and protection of designated areas. Starting with Europe's first national parks in 1909, the area protected in Sweden has increased substantially over that last decades. While emphasis historically has been on preserving biodiversity and natural environments, more recent policies have emphasized the role of protected areas for local and regional development. In this respect tourism is a key issue, especially since protected areas are often located in rural regions where employment opportunities and economic development are politically augmented. From a tourism point of view, protected areas often function as markers of attractive nature destinations having a positive effect on visitation numbers.

Sweden has set a target to double the tourism sector until 2020 implying a 500 billion SEK turnover and 260 000 jobs. Reaching the target is highly dependent on the natural and cultural heritage of Sweden and a critical issue is how to develop these values in a sustainable way. Sweden has still relatively large areas of undisturbed nature. More than 50% of the land area is forest, there are almost 100 000 lakes and a 2700 km coastline with archipelagos including more than 60 000 islands. There are great areas of marshes, bogs and pastures and almost one fifth of Sweden's surface area is mountain. These are all important assets for both outdoor recreation and tourism. Yet another important aspect of outdoor recreation in Sweden is the Right of Public Access which provides the right to roam freely in the countryside on both private and public land. But with the right come responsibilities – to take care of nature and wildlife and to show consideration regarding landowners and other people enjoying the countryside. The access is however partly repealed in territories with special requests such as national parks, certain nature reserves and wildlife habitats.

The main focus of this workshop is to discuss what Sweden should do to develop a sustainable tourism in protected areas and maintain natural values in further work. How should we manage access and at the same time stimulate visitors to come, enjoy and enrich themselves in the treasures of the protected areas. We are asking for your opinion and your knowledge!

# The environmental, social, health and economic impacts of recreational use of all terrain vehicles (ATVs) in North America: Lessons for Europe

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## Introduction

Throughout North America, the Off Highway Vehicle (OHV) lobby actively campaigns to open access to ATVs (Quads) on public and private lands whether in pristine protected areas or more developed rural communities to expand and connect their already extensive trail networks. This study reviews the relevant environmental, social, health, and economic literatures to ascertain the broad impacts of passively or actively supporting ATV access in public policy. The available evidence suggests, using Nova Scotia, Canada's ATV experience as a focus, that the costs substantially outweigh any public benefits. Furthermore, jurisdictions, including those now targeted for expansion by the ATV industry in Europe should carefully examine the North American ATV experience before granting unfettered access for ATVs to recreation and multiple-use areas. It is argued here that the public is better served by generally restricting ATV access in outdoor recreation areas rather supporting their use.

## The documented evidence

### *Environmental impacts*

There are three fundamental concerns regarding the environmental impacts of recreational ATVing. The first is landscape destruction, the second relates to vehicle emissions, and the third is noise. Experience in North America suggests that landscape damage from recreational ATVing is extensive and cannot be easily contained once ATVing gains a foothold (Wuerthner 2007). The second concern, one that has more direct health implications is ATV exhaust emissions. According to the US Environmental Protection Agency, ATVs produce from 16 to 35 times the amount of air pollution of the average family car, and the exhausts contain several carcinogens. Such high levels of exhaust plumes, particularly given the propensity of users to ride in large convoys, present a very real yet uncharted health hazard to users. The third environmental health concern is noise. Noise is a key irritant for host communities and ambient noise is recognized by the World Health Organization as a significant health hazard. While there are numerous popular media accounts of nuisance noise from ATVs, and the State of California among other jurisdictions, has measured ATV noise levels and established standards, the health hazard to host communities is yet to be systematically assessed. Be that as it may, ATVs are said to have a large auditory footprint, over a kilometer as one approaches and a similar distance as an ATV retreats.

### *Social impacts*

The literature assessing the social impacts of ATVing is sparse. On the one hand there is an emerging literature that documents the camaraderie among recreational ATV riders (e.g. Albritton, Stein, & Thapa 2009). And on the other, a neophyte academic literature (e.g. Pitter 2009) supported by burgeoning popular press coverage points to the escalating social discord in rural communities who are forced to endure recreational ATVing either as a result of enabling public policy or as a consequence of a policy vacuum. As in the village of Paradise, Nova Scotia, communities are increasingly taking legal action against local and regional governments that fail to protect their basic rights for peaceful enjoyment of their properties that are disrupted by recreational ATV use.

### *Health impacts*

ATVing is an extremely dangerous activity. In the United States The Centers for Disease Control and Prevention pegged the annual costs of death and trauma to the US economy at \$3.24 billion dollars (Helmkamp & Lawrence, 2007) while the combined estimates of ATVing and Snowmobiling in Canada was estimated at \$381 million (on a per capita basis this is similar to the USA). In response to the growing recognition of the health impacts of ATVing in North America, the Canadian ATV distributors council recently sponsored a study "to prove" that ATVing was a healthy active lifestyle. Its claim of health benefits have been brought into serious question, however, by Bissix and associates. (2012).

### *Economic impacts*

A number of economic impact studies sponsored by the ATV industry and various user advocates document substantial economic activity but fail to incorporate the broad costs of ATVing to society and as a consequence, overestimate net value. To attain a realistic economic valuation of ATVing, it is important to go beyond gross expenditures to include healthcare, landscape damage, atmospheric pollution, community nuisance, and law enforcement costs. Unfortunately, no such studies have comprehensively measured this. Even without a reliable estimate of environmental and social costs, however, the health burden to society of ATVing is sufficiently large to negate the net economic value of ATV sales.

## Summary and conclusions

In summary, it is clear that recreational ATVing has substantial environmental impacts as well as social, health and

economic costs that present a huge burden on the general public. While it is also clear, given the substantial adoption of ATVing as a recreational activity in North America that this activity is very popular--there are over 10 million ATVs in use in the USA alone--there is increasing evidence that their enjoyment is at public expense in terms of environmental damage, social upheaval and health burden costs. While this literature review provides a basis for assessment, the generation and analysis of purposeful data would allow for an increasingly more precise calculation of the social and

economic impact of ATVing. Although this study focuses on the North American experience, land-use and health promotion and protection policy makers in Europe, who have yet to feel the full force of aggressive ATV marketing, should heed this review as a warning in order to respond effectively when early adoption of ATVing moves to mass adoption in their jurisdictions.

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# Recreational carrying capacity in hiking trails. Three case studies in protected areas in Nicaragua

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To accomplish the goals of nature conservation, the protected area management may need to generate economic benefits through non-extractive use such as ecotourism, even though this is not the primary purpose of a protected area. Therefore, it should be considered the number of visitors that can be accommodated. As Shelby and Heberlein (1986) defined it, Recreational Carrying Capacity is “the level of use beyond which impacts exceed standards”. In this study the aim is to provide a range capacity that will maintain the standards for the wilderness experience by applying a minimum regulation of tourists on the trails. The ecological or economic carrying capacity is not within the scope of this paper.

## Methodology

Estimation of the carrying capacity of hiking trails in protected areas takes into account the specific physical conditions of the trails, the tourists' opportunities to experience the natural attributes of the site, and the management capacities of the protected area. The different components of RCC can be identified and estimated based on the particular conditions previously mentioned. The steps to estimate the carrying capacity starts out from Cifuentes (1992) and Somarriba et al. (2006) and are modified by the authors.

### *Spatial capacity (SC)*

The spatial capacity (SC) is the theoretical maximum number of persons that can be admitted during a day, considering the space available along the trails. Used in the meaning of “number of people occupying specific areas or lengths” (USDI Bureau of Reclamation, 2004), but not considering their impacts like Shelby and Heberlein (1986). The figure is given by the relationship between the available space in the hiking trail and the number of hours available to visit the site (Cifuentes, 1992).

### *Social Carrying Capacity (SCC)*

The social carrying capacity is the maximum number of visits that is possible considering the factors that could restrict the possibilities for appreciation of the area by the tourists under the critical minimum conditions of the site. There are limiting factors such as difficulty to walk on steep slopes or on inundated sections of the trail. These factors are defined according to the particular characteristics of the site. The SCC is estimated after applying the limiting factors to the SC.

### *Recreational Carrying Capacity (RCC)*

The RCC is the maximum number of visitors that should be allowed considering the social carrying capacity of the hiking trails and the managing capacity of the reserve. This

is the critical level for recreational purposes, because it considers the social variables that will affect the tourists' enjoyment of the area. It is a function of the social carrying capacity and the managerial capacities of the protected area to provide the minimum conditions for the tourists and the maintenance of the trails and associated facilities in the site.

### *Management Capacity (MC) of the Nature Reserves*

The management capacity is defined as the possibilities the administrators in a protected area have to develop tourism activities which meet the objectives of the protected area management plan (Cifuentes, 1992). The MC considers the infrastructure within the area, the equipment available, and managerial skills among the staff to implement and maintain tourism activities. For the estimation of the MC, variables such as legal authority, policies, equipment, competence of the staff, funding, infrastructure, and existing facilities are included in the rationale for assignment of values.

## Main results

The results are presented in table 1, indicating each of the factors estimated, the two figures in Spatial Limiting factor correspond to 50 meters and 100 meters distance between groups of tourists. Giving a range of SCC and RCC estimated for each trail evaluated.

## Conclusions

One of the main criticisms of applying carrying capacity is the difficulty to determine how much impact or change should be allowed (Manning et al. 2005; Papageorgiou and Brotherton 1999). As has been pointed out by Manning and Lawson (2002), managers need to be informed as much as possible by scientific data on the relationships between visitor use and resulting impacts. This type of information for protected areas in developing countries such as Nicaragua is not always available.

This RCC methodology allows identifying the physical factors that affect visitor impacts and the main constraints for the protected area management. It is an instrument for the administrators to improve the physical conditions and the management capacities of a protected area for tourist management. The methodology applied in this study is recommended for small protected areas. The sum of the trails' RCC does not provide the total RCC for the area. On the contrary, the lowest RCC rank is the one that limits the tourism operation.

Table I. Summary of Recreational Carrying Capacity (RCC) for the hiking trails in the Nature Reserves Mombacho Volcano, Datanlí-EI Diablo and Cosigüina Volcano

Nature Reserve	Mombacho Volcano		Datanlí-EI Diablo			Cosigüina Volcano		
Hiking trails	El Crater	El Puma	El Congo	El Leon	Campanero	Guacamaya	San Luis	El Humedal
Spatial Capacity (SC)	9436	6045	8236	9229	10603	2292	4187	6000
Limiting Factors	The spat LF has two values, as explained above, providing a SCC and eventually a RCC range.							
Spatial: spatLF (* include dead end correction)	0.09 0.17	0.09 0.17	0.09 0.17	0.09 0.17	0.09 0.17	0.05 * 0.09 *	0.05 * 0.09 *	0.09 0.17
Inundation: inunLF	0.99	0.99	0.99	0.97	0.99	1.00	1.00	0.96
Temporal closing: closLF	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00
Precipitation: precLF	0.69	0.69	0.75	0.75	0.75	1.00	1.00	1.00
Social Carrying Capacity (SCC)	510 930	320 580	560 1030	610 1200	720 1320	110 210	200 380	520 960
Management Capacity (MC)	74 %		62 %			54%		
Recreational Carrying Capacity (RCC) persons per day	From 380 to 690	From 240 to 430	From 350 to 640	From 380 to 690	From 450 to 820	From 60 to 110	From 110 to 210	From 280 to 520

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# A comparison of 5 western US *Wild and Scenic River* users: Trip characteristics, opinions and satisfaction levels

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## Background

Managing for high quality recreation experiences typically involves the use of traditional social carrying capacity variables; crowding, conflict, satisfaction, expectations and trip experience Shelby, (Graefe, Kuss & Vaske, 1990; Manning, 2011; Shelby & Heberlein, 1986). Rivers, similar to federally designated Wilderness areas, or other specially designated recreation areas demand tailored management (Whittaker & Shelby, 2007).

The purpose of this study was to examine river use on selected rivers in the western US. This river use study was part of a larger study conducted on selected US Forest Service (USFS) land and water-based recreation sites in Region 5 (Pacific Southwest Region) and Region 6 (Pacific Northwest Region). We examined data collected on five western US rivers with the intent of examining differences across the settings and to determine satisfaction in these settings.

Data were collected over a period of three years (2009-2011) in the US states of Washington, Oregon and California. The rivers settings included the Grand Ronde River, Oregon (n=166), Klamath River, California (n=135), Skagit River Washington (n=567), White Salmon River (n=1056), Washington, and the North Umpqua River Oregon (n=653). All five of the rivers are designated as “Wild and Scenic” rivers. The settings range from a more developed recreation setting (White Salmon River) to a river that is much more closely related to a “semi-wilderness” setting. No sections of rivers included in this study were located within federally designated Wilderness areas, although the North Umpqua River borders a Wilderness area. On-site interviews were conducted with a total of 2,577 river users from May through August over a three year period (2009-2011). The survey days were stratified across weekday and weekend periods, as well as morning, mid-day and evening timeframes.

## Results

A great deal of variation was seen in socio-demographics and trip characteristics across these five rivers. Though still significantly different, fewer differences were noted across the satisfaction and trip experience variables. The proportion of first time visitors ranged from a high of 24.1% on the White Salmon River to a low of 59.3% on the White Salmon River ( $P=147.699^{***}$ ). River users on three of the five rivers reported being first time visitors between 33.6% (Skagit River), and two rivers were similar, with 40.7% first time use on the Klamath River and 41.8% on the North Umpqua River. A similar range of responses ( $P=335.505^{***}$ ) was noted when inquiring about the trip type (day use or overnight), with nearly all (93.9%) of Grand Ronde River respondents on overnight trips and 60.0% of North Ump-

qua River users on overnight trips. On the opposite end of the spectrum, just 27.1% of Skagit River respondents on overnight trips, while about a third (34.5% of White Salmon River users were on overnight trips. The number of days recreating on the river on which the respondents were interviewed was significantly different as well. Skagit River visitors reported the highest number of visits (mean=16.1) days per year, followed by N. Umpqua River visitors (mean=13.0) and White Salmon River respondents (mean=10.1). Klamath River (mean=6.2) and Grand Ronde River (mean=7.4) visitors reported the lowest number of days recreating on their respective rivers ( $F=6.043^{***}$ ). Day users stayed an average of 4.2 hours, with significant differences noted. North Umpqua River visitors reported the longest duration of stay (mean=6.0 hours), followed by Skagit River visitors (mean=5.2). Klamath River visitors (mean=2.7) reported the shortest duration visits, followed by Grand Ronde (mean=4.4) and White Salmon River respondents (mean=4.7;  $F=39.226^{***}$ ). Quality and satisfaction ratings were all significant at the .000 level, as described below. Klamath River respondents reported the lowest quality ratings for four of the five quality items, while the Grand Ronde visitors rated the same items highest for four of the five items. Overall satisfaction can be considered very good to excellent for all rivers (mean=5.07 on a 6-pt. scale). North Umpqua River respondents reporting the lowest overall trip experience ratings (mean=4.26) and White Salmon River respondents reported the highest trip experience ratings (mean=5.56). The primary reason for visiting was understood by asking respondents their most important reason for visiting. Again, numerous significant differences were noted across the various rivers. The results showed that participating in the chosen recreation activity was more important than simply enjoying the place itself, although variation was noted across the rivers. Over half of White Salmon River respondents (56.3%) indicated that the activity was most important, while nearly half (48.7%) of both North Umpqua River and Skagit River users were activity-centric. Conversely, just 29.8% of Klamath River and 36.4% of Grand Ronde River users reported the activity as their primary reason. On none of the rivers was place the most important reason for more than one-third of the respondents. River respondents were also less likely to indicate that their primary reason for recreating was for social reasons (35% or less from all river users). When queried about whether there was an adequate balance between social and biological values regarding management of the rivers, the Klamath River (62% agree/strongly agree) was rated much lower than the other four rivers (Grand Ronde=78.2%, White Salmon River=75.4%, Skagit River=74.2%, and N. Umpqua River=71.1%). Finally, we wanted to understand if the ‘setting experience resource



managers are providing is that sought by visitors on a continuum of wilderness to social recreation. Recreationists on the Grand Ronde River felt that river should be managed more closely to wilderness/semi-wilderness (62.4%) than the other four rivers. Still, about half of the respondents on the other four rivers indicated their preference that the rivers be managed more closely to wilderness/semi-wilderness than for scenic or social recreation.

## Discussion

Significant differences were noted in the socio-demographic and trip characteristics across the five rivers. White Salmon River users were more likely to be first time visitors and Klamath River visitors reported lower satisfaction levels, and Grand Ronde River users were most likely to be overnight users. Potential reasons for these differences are discussed and contrasted with Wilderness and front-country settings.

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# Too many people in the mountains in the winter time?

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## Introduction

Outdoor activities in natural landscapes have become very popular in recent decades. Especially new trends in winter outdoor activities such as backcountry skiing and snowshoeing attract a broad range of recreationists of all social groups (Lamprecht, Fischer et al. 2008). Therefore the crowding of such areas has become an increasing concern as it affects the perceived attractiveness of an area. Crowding situations also lead to alternate route choices and use conflicts with wildlife. Therefore, the carrying capacity question of “how much use or impact is too much”, arises (Manning 2002).

## Method

Data used for this study has been collected in 2010 as part of a larger project which focuses on developing specific tools to monitor and manage recreational activities (mafreina). In an online survey, concerning winter recreational behaviour in the Swiss Alps, the perception of crowding was one focus. Among other questions, 934 recreationalists responded to four crowding situations during the winter, which were shown on photorealistic images. The method of “people at one time” (PAOT) was applied and respondents evaluated crowding on a 9-point-scale ranging from “too few people” (crowding level 1 to 3) over “pleasing number of people” (crowding level 4 to 6) to “too many people” (crowding level 7 to 9) with the ideal number of people set as the middle value of 5 (Manning 2007). At this point, the perception of the number of people has reached the highest acceptance (see Figure 1. Perception of crowding in the mountains in wintertime (y-values: 1 to 3 = too few people, 4 to 6 = pleasing number of people, 7 to 9 = too many people) Figure 1). For the statistical analysis, respondents were segmented by “snowshoe” and “ski/snowboard”.

Beside this PAOT-experiment the respondents had to answer a choice experiment too. With the choice experiment, the backcountry skiers were segmented into the four different groups “short tour group”, “solitude lovers”, “easy to view seekers” and “advanced specialists” (latent classes). Then the group means were analysed regarding the perception of crowding in the PAOT.

## Results

When the mean responses are plotted along a curve, they represent a social norms curve, which has been applied in many similar carrying capacity studies (Manning 2002; Needham and Rollins 2005; Vaske and Shelby 2008). In Figure 1, the perceived-means of the number of people are shown with their respective standard errors (+/-1 se).

If the number of people falls below a crowding level of 3, the pictured situation would be evaluated negatively (Arnberger 2003). This was never the case in this study, as even with zero people in the picture, the situation was perceived

as a “pleasing number of people”. This indicates that there is no negative perception associated with “too few people” within our sample. The change in perception from “pleasing number of people” to “too many people” occurs when with more than 8 people in the scene, clearly suggesting the existence of a perceived crowding situation among ski-/snowboarders and snowshoers at the high end of the spectrum.

For the statistical analysis, respondents were segmented by activity, gender and age-group: Most variables do not show a normal distribution (Shapiro Test:  $p < 0.05$ ). Therefore, a Kruskal Wallis Test (H) was applied for group comparisons. The two activity groups of “snowshoers” and “skiers/snowboarders” show no significant difference concerning perceived crowding ( $H=0.47$ ,  $df=1$ ,  $p=0.49$ ). A significant difference emerged with crowding and age ( $H=30.11$ ,  $df=6$ ,  $p < 0.001$ ) as the older age-group ( $>65$  years;  $n=187$ ) tends to be more tolerant with a high number of people than the 24 to 30 year olds. The highest variability of sample means was associated with the youngest age-group ( $<20$  years;  $n=40$ ) who seems to be less determined in their perception concerning the number of people. Generally there is a higher acceptance of other people in the picture with increasing age among the respondents.

To test the effects of distance, the people shown on the pictures were arranged in four different spatial compositions “none” (no people), “foreground” (groups in foreground), “background” (groups in background) and “both” (equal distribution of groups in fore- and background). Significant differences among the spatial compositions emerged ( $H=457.1$ ,  $df=3$ ,  $p < 0.001$ ). As expected, the lowest ratings on the crowding scale are observed with no people in the picture. Background and foreground compositions show similar ratings whereas the distributions of people in foreground and background at the same time (“both”) get a significant higher rating than the other arrangements. Therefore it can be said, that the perception of crowding also depends on the distribution of people in the visible area.

The PAOT analysis of the four groups from the choice experiment endorses that “advanced specialists” and “solitude lovers” show the highest crowding mean values, whereas “short tour group” and “easy to view seekers” indicate significant lower crowding mean values ( $H=9.66$ ,  $df=3$ ,  $p=0.022$ ). Moreover, the activity group “solitude lovers” is significantly younger than the other activity groups. Especially “easy view seekers” and “advanced specialists” show significantly higher mean values in age, than the other activity groups ( $H=27.84$ ,  $df=3$ ,  $p=3.9e-06$ ). Regarding the gender mix, the fraction of males is high with “solitude lovers” and “advanced specialists” whereas the share of males is significantly lower with “short tour group” and “easy to view seekers” ( $H=46.73$ ,  $df=3$ ,  $p=3.9e-10$ ). Thus, these findings

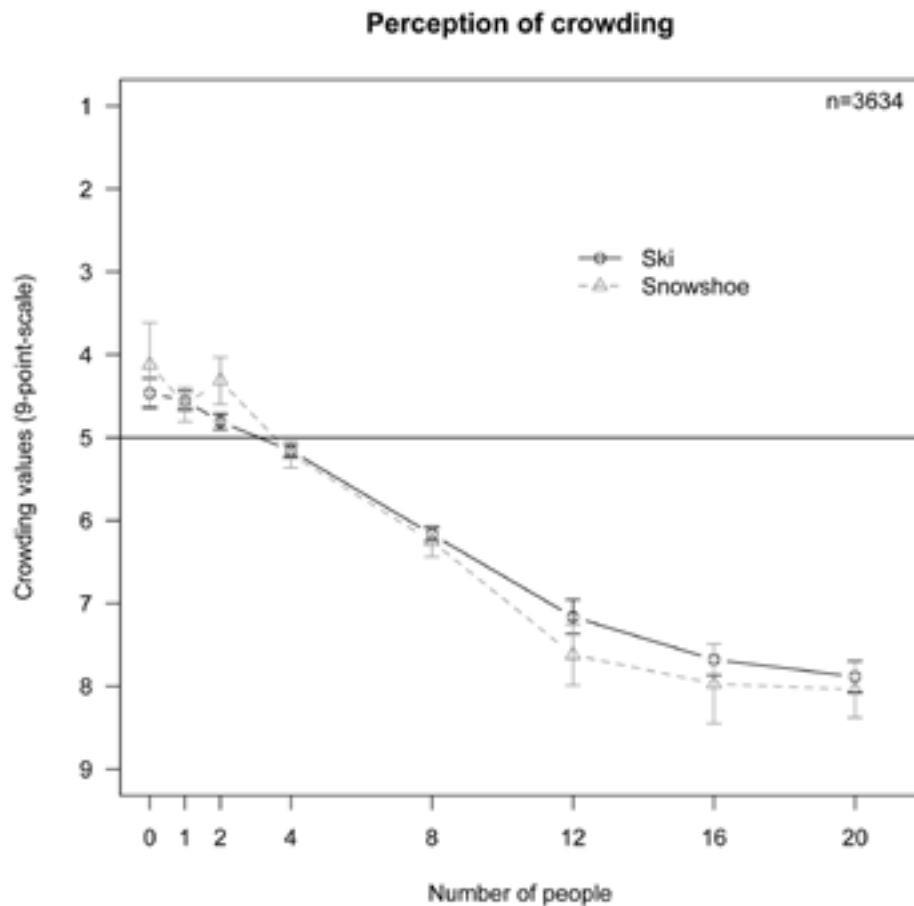


Figure 1. Perception of crowding in the mountains in wintertime (y-values: 1 to 3 = too few people, 4 to 6 = pleasing number of people, 7 to 9 = too many people)

show that the perception of crowding strongly depends on the activity type, which needs to be taken into account when evaluating crowding situations.

## Conclusion

In this study, the question if there are too many people in the mountains in wintertime cannot generally be answered, but it allows a deepened understanding of the perception of crowding situations. The study shows that for winter activities, the perception of crowding strongly depends on the tour type as well as on the distribution of people in the visible area. Unlike summer activities (Arnberger 2003), the winter activity-type does not show a significant influence. Thus the perception of crowding in the mountains in wintertime is perceived differently than in summertime. The

findings of this study provide a new source of information regarding leisure and tourism management which can be helpful in assessing management implications for park areas and wildlife protection zones. Further data analysis in the framework of mafraina will provide more information on the crowding topic.

## Acknowledgements

We want to thank all the project partners for the good collaboration and financial support: Canton Grison, Biosfera Val Müstair, Swiss National Park, Rapp Trans AG, Impuls AG and Art of Technology. The project is mainly funded through the Swiss commission of technology and innovation CTI.

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# Perception of crowding in a high-use German national park

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## Introduction

In the short history of German National Parks, visitor-related research has focused primarily on the ecological impacts of high numbers of visitor. Issues of social carrying capacities have been understudied, even though visitor numbers suggest that social conflicts seem very likely. For Germany there are only a few studies dealing with social carrying capacity in recreational areas in general and crowding in particular (Volz and Mann, 2007; Kalisch and Klaphake, 2007; Kalisch, 2012).

Recreational research in North America found crowding to be a complex phenomenon, with only a weak relationship between visitor density and perceived crowding. The normative approach to crowding assumes that other factors, such as motivations for the visit or the experience of visitors, contribute to the creation of norms, which serve as individual standards (Manning, 2011). Visitors compare their standards to actual conditions, resulting in an evaluation of the situation as crowded or not.

## Study area

Saxon Switzerland National Park (SSNP) is located 50 km southeast of the urban area of Dresden. A systematic year-round visitor counting in 2009 revealed that the Park has 1.7 million visitors per year with two seasonal peaks in spring and autumn. This means that the SSNP has the highest visitor density of all German terrestrial national parks with 183 visitors per hectare. More than half of the visitors were counted at the “Bastei”, a nationally known destination (Job et al. 2010).

## Methodological approach

Two case studies were conducted in autumn 2009 ( $n=280$ ) and spring 2011 ( $n=312$ ), covering workdays and weekends. In personal on-site interviews visitors were asked about the characteristics of their visit (e.g. experience, motives and activity) and the characteristics of those encountered (number, behavior and expectations for visitor numbers). Questions concerning visitor numbers were visually supported by a series of digitally calibrated pictures. Perceived crowding was measured with the help of a nine-point Likert-scale. To determine the influencing factors on crowding, a logistic regression modeling was employed with binary recoded perceived crowding as dependent variable. The question which examines the displacement effects of crowding refer to future displacement and already existing displacement, so that first-time visitors are included in the study.

## Results

The overall mean for crowding perception suggests that only slight forms of crowding exist in the national park.

However, at the Bastei nearly three of four visitors rated the situation as at least moderately crowded and about one fifth of visitors feel “very” or “extremely” crowded. The high correlation between perceived encounters and perceived crowding (Spearman-Rho = 0.67,  $p<0.01$ ) suggests that visitors to SSNP seem to be relatively intolerant to high visitor numbers. Topography may play a decisive role here. The Saxon Switzerland is a low mountain range area mostly covered with wood, resulting in a small field of vision. Consequently when visitors encounter other people, they probably see them from a short distance and will often have to react on them as hiking paths are narrow. Results of the logistic regression modeling show that apart from visitor numbers, motivations for the visit and the expectations of use levels are also important factors which contribute to the perception of crowding. Visitors whose main motivation for the visit is experiencing nature are more likely to report crowding than visitors with recreational or social interaction oriented motives. Underestimated use levels increase the probability to perceive crowding. These results underline the key role that comprehensive visitor information can play in taking counter-measures against crowding.

About half of the visitors are already reacting or plan to react to crowding (48.7%). Spatial and temporal displacement were equally chosen strategies. There seems to be a high attachment to the national park area as only a minority of respondents plan to visit other recreational areas instead. Experienced visitors with more than five visits in the national park clearly prefer an intra-area displacement to a temporal displacement. Visitor satisfaction is affected by crowding (Spearman-Rho -0.24,  $p<0.01$ ) although the correlation is weak.

Short term measures, such as charging higher parking fees during peak season address the unequal temporal distribution of the visitor numbers. In the long run, the main task for management of recreational areas should be monitoring the visitor numbers and their recreational experience. It is important to understand the relationship between visitor density and perceived encounters because most measures against crowding normally target visitor numbers. New web-based tools can help to gather data about visitor experience cost-efficiently. Brown and Weber (2011) used a Public Participation GIS to gather spatial data about the different kinds of recreational experiences in the park system of Victoria, Australia. This promising approach should be further developed and integrated it into a mobile web application, enabling an automatic positioning of the rated recreational experience. The generated data have to be communicated effectively to the visitors. Again, the mobile web has great potential here. Informed visitors have the possibility to plan the visit according to their preferences and they will underestimate the use levels less frequently.

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# Developing the useability index for the Swan Canning Riverpark

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The Swan River Trust is a Western Australian government agency charged with protecting and managing the Swan Canning river system that winds its way through the capital city of Perth. The Trust is required to manage, monitor and report on river health and community benefits derived from use of 72km<sup>2</sup> of public land and river reserve identified as Swan Canning Riverpark.

The Useability Index was developed to provide a set of indicators to assess the quality and amenity of parks and recreation reserves managed for public access within the Swan Canning Riverpark. Results can be assessed for each site, a group of sites or particular type of site and provides an indication of the diversity and extent of reserves and their capacity to contribute to community health and well-being.

The concept of “useability” was drawn from a PhD study that explored perceptions of nearby green spaces and self-reported health where it was found that people who perceived nearby green spaces as “useable” were twice as likely to report better general health. (Carter, 2009). Integration of quantitative and qualitative data collected in this study enabled several common elements of “useable” green spaces to be identified. It was determined that useable green spaces need to:

- be in good condition (look cared for);
- be well-equipped for visiting (be welcoming, with paths, obvious access points and community infrastructure);
- include places where people can relax;
- include places where people can meet others;
- be connected to the neighbourhood, both physically and emotionally (be a part of, not apart from);
- offer personal security (feel safe, other people around, not isolated unless by choice); and
- meet the needs of multiple users (different settings to meet different needs and expectations).

Indicators selected for inclusion were based on the findings of this research, review of similar assessment tools and related literature. In particular, aspects of assessment included in three other tools were considered as part of the initial development process. Suggestions for open space assessment provided by researchers involved in the Millennium Ecosystem Assessment included:

- Recreational opportunities provided;
- Landscape condition;
- Presence of sites, landscapes or species with spiritual or cultural significance; and
- Presence of site or species of scientific or educational value (Ash et al., 2010).

A local tool, entitled the Quality of Public Open Space Tool (POST) was developed to audit park facilities and features

(University of Western Australia, 2004). POST can be used to assess the quality of a specified area of public open space through accumulated scores for:

- Type of usage and activity options;
- Environmental quality including presence of water and other natural features, trees and shade, pathways and evidence of care through regular maintenance and lack of graffiti, vandalism or litter;
- Amenities such as playgrounds, picnic facilities, parking, toilets and public transport; and
- Safety, particularly lighting and visibility.

Elements of one further tool, SpaceShaper, developed by the UK Commission for Architecture and Built Environment were also considered (CABE, 2007). Eight aspects of open space quality are explored within the SpaceShaper toolkit:

- Access (finding your way and getting about);
- Use (what activities and opportunities the space has to offer);
- Other people (how the space caters for different needs);
- Maintenance (how clean and cared for the space is);
- Environment (how safe and comfortable the space is);
- Design and appearance (what the space looks like and what materials it uses);
- Community (how important the space is to local people); and
- You (how the space makes you feel).

Aspects of many of these elements can be seen in the table provided. Table 1 includes descriptions of the various layers of the Useability Index – from its overarching themes to individual assessment items and the aspects of each that are considered during each site assessment. Assessment items can score a maximum of ten (10) points with maximum total score of 100.

Used alongside ecological health indicators, assessment of potential community benefit through the Useability Index can provide rationale for management intervention and investment. To extend its application within park planning and management processes, the current site assessment process includes mapping the location and extent of different types of places within the Riverpark. This data is being included in the Western Australian Department of Environment and Conservation Asset Management system and Index elements are aligned with aspects of visitor satisfaction surveys to enable comparison of perceptions held by land managers and park users.

This presentation will discuss the development and current application of the Useability Index for the Swan Can-

Table I. Descriptions of themes, components and assessment items included in the Useability Index for the Swan Canning Riverpark

Themes	Components	Assessment items
<b>CONNECTION</b> How emotionally connected might people be to this site?	<b>AESTHETICS</b> The visual appeal of natural elements and the overall appearance of each site plays an important role in developing community connection and encouraging use	<b>Natural appeal</b> Appealing water quality (clean, clear and odourless) Presence of endemic trees and/or riparian vegetation Presence of wildlife/wildlife habitat Attractive river and cross-river views
		<b>Site condition</b> Attractive general condition Appears cared for and maintained to appropriate standard No obvious long-term graffiti, litter or damage
	<b>ATTACHMENT</b> Engendering "a sense of place" and emotional attachment to cultural, spiritual or historical connections and landscape features plays an important role in willingness to visit, care for and protect river parklands	<b>Visitation &amp; involvement</b> Well visited (known or observed) Volunteer or other community involvement in caring for site or site infrastructure
		<b>Sense of place</b> Known spiritual, cultural or historical significance (Noongar and/or contemporary) Presence of significant landscape features (such as river cliffs or beaches) Well-placed interpretive materials
<b>FUNCTION</b> How well does this site function as a destination for relaxation, recreation or specific activity?	<b>ACTIVITY INFRASTRUCTURE</b> Appropriate activity infrastructure enables people to engage in a variety of physical activity, recreational pastimes, social gatherings and community events	<b>Activity spectrum</b> Site appropriate range of opportunity and infrastructure to enable engagement in land and water-based activity
		<b>Comfort &amp; safety</b> Well-maintained site-appropriate facilities (such as toilets, shade and shelter, seating, BBQ and picnic areas) Easy to navigate (appropriate signage, pathways and/or lighting) Natural surveillance (line of sight) where appropriate
	<b>ACTIVITY AMENITY</b> People seek appealing and amenable places where they can relax, reflect, meet others and socialise with family and friends	<b>Relaxation &amp; reflection</b> Variety of places where people can relax, reflect or spend quiet time. Appropriate ambient noise level Placement of activity infrastructure limits disruption or conflict from other users
		<b>Social interaction</b> Comfortable spaces where people can gather Placement and design of facilities and infrastructure to enhance opportunities for positive social interaction
	<b>ACCESS</b> Ease of access to areas within the site (such as pedestrian linkages to different areas), and access to the site (how people can get there) determines how well parklands can be used by visitors	<b>Land access</b> Appropriate pedestrian/cycle access within site Pedestrian and vehicle linkage to surrounding areas (including public transport to regional sites) Appropriate placement of parking and vehicle access within or adjacent to site
		<b>Water access</b> Water access (entry and egress) for people and watercraft (including beach, bank, ramps, jetties or other access ways)

ning Riverpark and potential adaptation for its use in other park contexts.

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# A study of “The impressive experience” in Japanese national parks

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## Introduction

The national parks of Japan were established to conserve nature as well as enrich the lives of those who visit these places. National park management has, however, focused mostly on conservation. This may be, in part, because few studies have been conducted that assess the psychological benefits of visiting the parks. Therefore, we conducted a visitor survey in 2010 to explore how visitors use the park to enrich their lives.

Those who visit national parks to experience their beautiful landscapes are sometimes deeply moved by the lush, breathtaking scenery. Such “impressive” experiences of being deeply moved are one reason why people visit national parks. However, very few studies have examined the impressive experience in Europe and the United States because there is not an appropriate noun in English that expresses this concept (Tokaji 2001). In Japan, Nishiyama (1995) indicated that impressive experiences in nature cultivate self-esteem in adolescents, and Oshimi (2009) indicated that sport spectators tend to revisit the stadium after they have had impressive experiences. However, few previous studies have identified or assessed the features and functions of impressive experiences in national park settings. Accordingly, in 2011, we conducted a visitor survey from the viewpoint of “the impressive experience.”

## Methodology

Data for this study were collected by a self-administered questionnaire in four major Japanese national parks (Shiretoko, Nikko, Kamikouchi, and Tatyana areas) from July to October 2011. From the 18,800 questionnaires that were distributed at major tourist attractions in each destination, a total of 6,006 responses were obtained yielding a response rate of 31.9%.

## Results

Compared with the mean score of strength of impression (significance level 1%), we studied who had a magnificent impression. Results show that “the first-time visitor”, “the under thirties”, “female”, “the people who spend a long time walking in the national park”, “the people who visited national park on a clear day” have a magnificent impression. In addition, because the impact of the weather is very strong, we conducted the same analysis using data only from respondents who visited on a clear and reported the same strength of impression.

Next, we studied the relationship between the strength of impression visitor activity satisfaction. Results show that the satisfaction of “see the scenery” is strongly connected to the greatness of impression (odds ratio 12.9; 99% confidence interval 16.24 to 10.27). The satisfaction of “appre-

ciate flowers and trees” is also strongly connected with the greatness of impression (odds ratio 6.96; 99% confidence interval 8.88 to 5.45). From these results, the satisfaction of “see the scenery” has a stronger connection with the greatness of impression than the satisfaction associated with any other visitor activity satisfaction (significance level 1%).

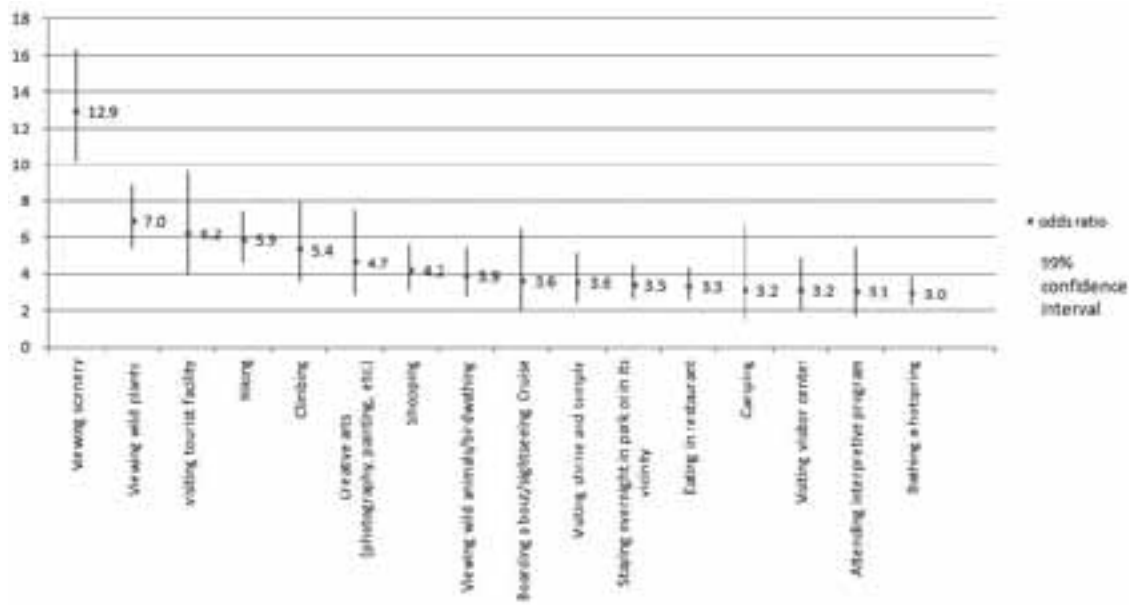
We also focused on the moment of impressive experience and studied the relationship between the strength of impression and the element of impression. Results showed that “beauty” is strongly connection with the greatness of impression (odds ratio 11.35; 95% confidence interval 13.50 to 9.55). “Magnificence” has the next strongest connection with the greatness of impression (odds ratio 7.60; 95% confidence interval 8.94 to 6.46). According to these results, “beauty” has a stronger connection with the greatness of impression than any other element (significance level 5%).

In addition, many respondents answered that “magnificence” and “beauty”, as experienced in the national park, could not be experienced through television or the Internet. Compared with the interval estimation of the population rate (significance level 1%), “magnificence” (90.6% of respondents) is higher than “beauty” (81.0% of respondents), and “beauty” is higher than other elements of impression. Thus, in their promotion and advertising of national parks, managers should emphasize the park’s beauty and magnificence and then reiterate that these attributes can be experienced only by visiting the area. Using this strategy, managers will encourage potential visitors, thereby increasing total visitation.

Finally, a correlation analysis was conducted to study the difference between “impressive experience” and “overall satisfaction.” Results showed that “impressive experience” ( $r = .479$ ) was more significantly correlated with “contribution to the richness of life” than “satisfaction” ( $r = .399$ ) (significance level 1%). We believe the purpose of visiting national parks is the “utilization of the richness of life”, so “impressive experience” is an important index to manage national parks from the visitors’ viewpoint. “Impressive experience” ( $r = .430$ ) was also more significantly correlated with “intention to recommend” than “satisfaction” ( $r = .364$ ) (significance level 1%), which indicates the “impressive experience” feature tends to be communicated and shared. We strongly believe that more people visit national parks to add richness to their lives, so word-of-mouth is important to attract potential visitors to national parks. Thus, “impressive experience” is also an important index to manage national parks in order to increase the number of visitors. In regard to “intention to revisit,” there is nothing statistically significant about the correlation coefficient between “impressive experience” and “overall satisfaction.”



Table I. Odds ratio for relation between the strength of impression and the satisfaction of the visitor’s activities.



“Impressive experience” is negatively correlated with “number of visiting times” (significance level 1%), which means the more visits a person makes to a national park the fewer “impressive experiences” they have. “Impressive experience” is not necessarily relevant to analyze characteristics of the high-repeat visitor.

Thus, further research is needed to better understand the structure of the “impressive experience” from the repeat visitors’ viewpoint. Moreover, further research should focus on the features of places where visitors encounter impressive experiences, and then use the results in the planning and management of national parks.

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# Two legs good – two wheels bad? Are mountain bikes really bikes for the mountains? – What does ‘responsible access’ in the uplands mean conceptually and in practice for mountain bikers and land managers in the Cairngorms National Park?

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## Background

Scotland has the most liberal access legislation in the world. Recreational users enjoy a right of non-motorized access to most land and water under the Land Reform [Scotland] Act 2003. The rights have to be exercised ‘responsibly’ (Scottish Outdoor Access Code 2005) and the concept underpinning the Act is one of ‘shared use’ in that all users are afforded equal legitimacy. However as the potential of the mountain bike as a “dream machine” (Ruff and Mellors 1993) is explored, and as mountain bikers extend their explorations to more remote areas like the Cairngorms plateau, the ‘contested nature’ of upland access has sharpened (Brown et al 2008, Macnaughten and Urry 1998).

Many land managers express concern around the physical and social impacts of mountain bikes, and a sense that mountain bikes are ‘inappropriate’ in certain settings (Horn et al 1994, Cessford 2003, Carothers et al 2001). They regard the personal judgment of ‘responsibility’ and voluntary restraint implicit in the legislation as an inadequate tool to protect areas. These concerns are enhanced within the Cairngorms National Park, which by its very designation as an IUCN Category 5 Protected Area is regarded as deserving of special care.

## Aims

The research set out to examine the following:

- The relevant literature that relates to conflicts over access and recreation in protected areas
- How access rights and responsibilities are conceived and enacted in the montane core of the Cairngorms National Park
- The influences that shape different interest groups view of mountain biking in the mountains and uplands, and how this relates to their perceptions of how they should be used

## Methodology

Primary data was generated using a qualitative research approach. Two focus groups were organized – one for land managers and the other for mountain bikers. Each focus group was posed a series of questions under approximately five topic areas (see Table 1 below) and conducted over a two and half hour period. Data was recorded and fully transcribed, before analysis using NVivo software.

## Findings

What emerged was a considerable gulf in ideological positions – many land managers (and other hill-users) remain

Table 1. Developing the Themes

Theme	Topic Areas
The Cairngorms uplands	Value and meaning of the Cairngorm mountains to participants; what adds or detracts from that experience; and how they should be used
Social and environmental impacts of mountain biking	Perceptions of damage, erosion and social impacts; and the relationship to wider recreational, and other land use
Decision making (mountain bikers focus group only)	Internal and external factors that influence the ‘when, where and how to ride’ decisions
Surfaces – upland paths and tracks	Who and what paths are for (“entitlement”); the effect of upland path work and implications for biking
Scottish Outdoor Access Code	Participants understanding of the Code; perceived strengths and weaknesses of the Code; other sources of information that guide responsible access; and the responsible to irresponsible continuum
Promotion	Implications of promoting and publicising routes in sensitive areas; engaging with land managers; and education v regulation

opposed to the concept of mountain bikes in the mountains and no amount of ‘rational’ argument, or infrastructure built to accommodate dual use, is likely to unsettle this.

The main areas of contention revolved around the interpretation of responsible access, and the agency of path work interventions.

Firstly, the fluidity and flexibility of the interpretational approach to responsible access is something that confounds attempts to simplify and provide clear-cut guidance about appropriate behaviour. A mountain biker’s perspective is that responsible riding is about being responsive to conditions, not necessarily following the strictures of a written text, demonstrating a resistance to the ‘fixing’ of places and surfaces as in-bounds or out-of-bounds to mountain biking. The implications of this refusal to see landscapes as fixed, unchanging entities and see them as evolving artifacts with history, means that management based on spatial or temporal zoning is difficult to ‘sell’ or implement, especially given that the Scottish access legislation is based on an all-encompassing *a priori* rite of passage.

In terms of enacting responsible access, mountain bikers demonstrate an almost over-exaggerated awareness of social interaction on the hill. By and large they choose to exercise their right knowing they will meet opposition, and they manage their time and space to avoid this if possible – without compromising the satisfaction of their activity. The mountain bikers’ position strongly accords with the Land Reform Act and Scottish Outdoor Access Code, which assumes the basis of responsible access as individual choice and decision-making.

Both groups viewed education as an essential tool in managing access and promoting responsible behavior. Mountain bikers view education as part of an apprenticeship

which involves acquiring both biking skills and environmental awareness of how and where to ride – this is something learned through practice. As the context specific nature of responsible access means that it is as much about what is ‘read’ on the ground, as is ‘written’ in the Code (or other texts), this has implications for the value of buttressing the Code with more detail.

Secondly, in the disparity of what paths mean to people – who and what they are for – we find the biggest gulfs in understanding of responsible access. An engineered path surface sends out different signals to different interests. For mountain bikers, it was ‘pathness’ made manifest, an invitation to use that surface for passage, and subject to reasonable speed and care for other users, an indication of Code compliant behavior i.e. not going ‘off’ path. That same, engineered surface however may signal to a land manager (or other user) that a response to damage has been instigated and that the toughened veneer is *itself* deserving of protection. Thus, the research findings highlighted an uncomfortable tension between a concept of responsible access – using a path – and a concept of irresponsible access – damaging a path through the act of using it.

The disposition of land managers *against* biking use on upland paths contrasts with the desire for, and existing practice of, mountain biking in the uplands. Overall neither stakeholder group had an interest in making access to uplands physically easier, and there was an almost unanimous desire to retain areas with wild land qualities. But the fact that some path work intervention has had precisely the effect of easing general access to the hills, and at the same time disintegrated existing bike access, is an area of tension that needs to be addressed in the future.

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# Visitors' attitudes toward introducing a new visitor management program into a brown bear habitat in Japan

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In order to balance tourism activities and resource protection, managers have considered the implementation of some restrictive management actions in protected areas. These actions include limiting visitor numbers, limiting the length of stay, using designated accommodation, restricting specific activities, and visitor education (Hammit and Cole 1998). The effectiveness of such management actions has been evaluated by the effects on natural resources (Reid and Marion 2005), and by visitor evaluations (Vorkinn 1998; Daniels and Marion 2006). To be successful, these management actions need the support of stakeholders and the acceptance of visitors.

Shiretoko National Park, in northern Japan, is known as one of the highest density brown bear habitats, and was registered as a World Natural Heritage site in 2007. In particular, the Shiretoko-goko Lakes hiking trail has frequently been closed by the appearance of brown bears in summer, because the wetland plants they prefer grow there. The season in which brown bears are frequently observed overlaps with the tourist season, and there are concerns about the possible risk of encounters between brown bears and visitors. Tour operators and tourists have complained about the frequent closure of the trail, and demands have been made to determine ways to avoid inadvertent contact between visitors and brown bears. After two years of stakeholder discussion, the park administrator decided to introduce a new system to restrict the number of visitors and their behaviors from the spring of 2011. During the period in which brown bears are active in early summer (May 10 to July 31), visitors may only participate in guided tours with licensed guides. Guided tour numbers are limited to 300 a day. From summer to fall (August 1 to November 10), the visitors must attend a 10-minute lecture before hiking, and hiker numbers are limited to 3,000 a day. In both cases, visitors are required to pay for the service. In June 2010, experimental tours were carried out to examine the feasibility of the new management program.

The purpose of this study was to compare the knowledge, acceptance, and satisfaction of visitors with the guided tours, preliminary lecture, and hiking restrictions in the Shiretoko-goko Lakes hiking trail before and after implementation of the new management program.

## Methods

Questionnaire surveys were carried out to investigate visitors' attitudes before and after the introduction of the new program. There were several types of visitors: visitors who attended the guided tours (1,005 in 2010 and 652 in 2011), visitors who did not attend the tours in the bear active season (540 in 2010 and 404 in 2011), and visitors who visited in summer and fall (529 in 2010 and 393 in

2011). About half the summer and fall visitors attended the lecture and hiked the trail by themselves. Every visitor was handed the questionnaire sheets after the tour or their hike, and asked to mail it back. Questionnaire items included their motivation to visit Shiretoko-goko Lakes, previous knowledge about the new limitations on use, their information source, their acceptance of the new program, crowding perception, and their overall satisfaction. Guided tour attendees and visitors who took the preliminary lecture were asked to evaluate their satisfaction with the registration process, content of the lecture, and the guides. They were also asked to evaluate their sense of safety regarding the brown bears before and after their hikes.

About 60% of respondents were female, half were more than 50 years old, and about 70% were from outside Hokkaido.

## Results

Visitors were most frequently motivated by the opportunity to "experience the wilderness landscape". Figure 1 displays the comparison of visitors' acceptance of the new management program. Around 90% of guided tour participants and those who attended the preliminary lecture accepted the new management program positively. The acceptance of visitors who did not attend the guided tours or preliminary lectures was slightly lower. The satisfaction of tour and lecture attendees was higher than the satisfaction of other visitors. Satisfaction and acceptance of the new program were correlated.

## Conclusions

There were several differences in visitor perceptions before and after the implementation of the new management program in Shiretoko-goko Lakes. Guided tour and preliminary lecture attendees showed greater acceptance of the use limit and greater satisfaction in their travel than other visitors. The results indicate the importance of the tour guides and lecture staff. Their direct communication seems to increase visitors' understanding of the management actions.

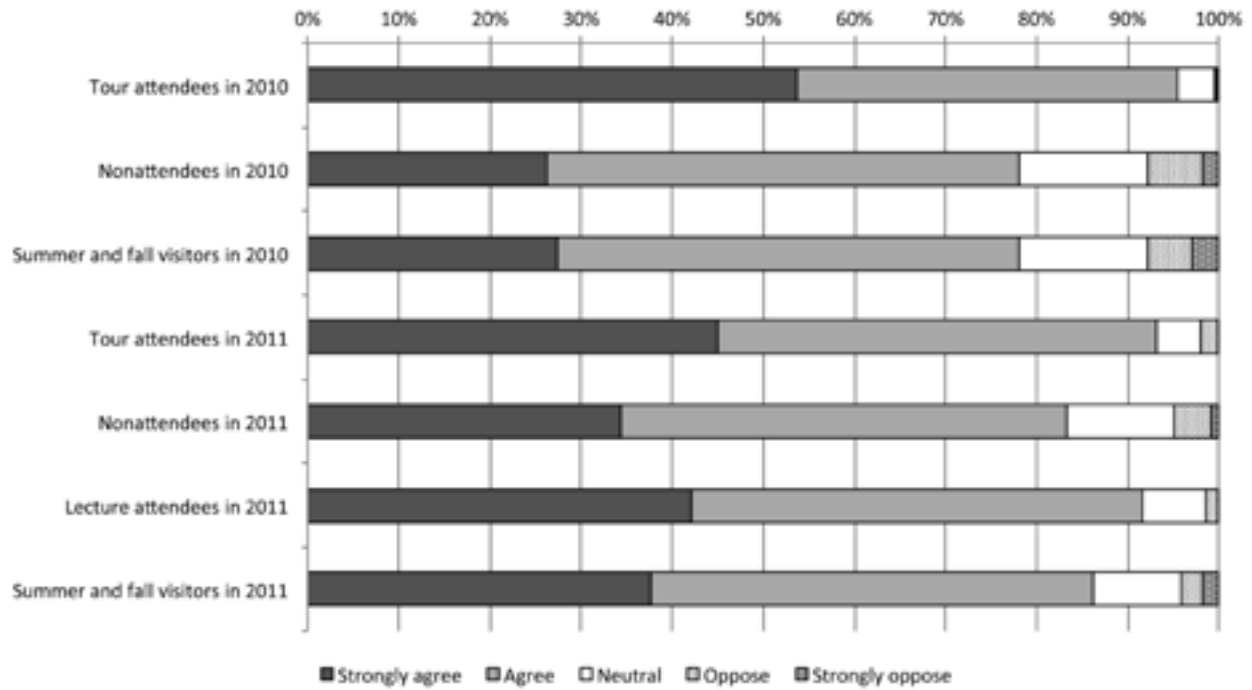


Figure 1. Visitors' acceptance of the use limits in Shiretoko-goko

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# Method for managing visitor experiences

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## Introduction

A visitor experience is 'a complex interaction between people and their internal states, the activity they are undertaking and the social and natural environment in which they find themselves' (Borrie and Roggenbuck, 1998). Managers of leisure destinations wish to know what kind of experiences are popular. A visitor typology of experiences can help in effective marketing, to adjust the physical environment and infrastructure to visitor behaviour, and to minimize negative social, cultural, and environmental impacts of visitor use (Raadik and Cottrell, 2007). Cohen (1979) provided a theoretical and conceptual classification of visitors based on their experiences. Based on Cohen's experience domains, Elands and Lengkeek (2000) identified five modes of experiences with specific experiential and motivational characteristics. Cottrell et al. (2005) successfully applied the dimensions developed by Elands and Lengkeek in a study of Dutch forest service visitors. In his study Cottrell found a difference between tourist experiences for people on a vacation versus a day trip. Based on the results of Cottrell, Goossen and Boer (2008) reformulated Elands and Lengkeek's modes of experience into five short stories with the following motives: amusement; having a break; interest; immersion and physical challenge.

In our research we try to identify the salient quality conditions in the supply and preferences for each motive. Research shows (Goossen, 2010) that there are very distinctive elements and facilities for each motive. Each motive 'claims' its own quality conditions in natural settings with its own landscape preference and facilities. The focus in this research is to translate these conditions and preferences into concrete managerial items. A method is developed to help managers to work more demand-driven according to the motives. The method is an assessment of the suitability of a park for each motive.

## Method

The method has a demand-driven base, consists of an internet analysis, map analysis, field analysis and an interview with the park manager. The method will end with results and recommendations for the park manager. The implementation must be done by an independent expert in recreation and not by park managers. The reason is that park managers have too much inside information to be objective. The method starts at "the visitor's home" with an investigation of the amount and kind of information about parks in the vicinity using internet and tourist information offices. The next step is to invest the accessibility between "the visitor's home" and the park to visit. How easy is it to reach the park using your car or bike and what kind of scenery do you encounter during your travel. The third step is to invest the experience atmosphere and the facilities at the entry of the park. The last step is to invest the experience

atmosphere and facilities of the park itself. Starting point is a walk for 1.5 hour through the park. A total of 190 indicators are distinguished. Most indicators can be scored with a yes or no. The assessment of the park is designed as an app for smartphones. At the end of the assessment, there is a direct result.

Amusement has the most indicators and Challenge the least (table 1). Important to notice is that Amusement has more utility indicators than experience value indicators. To a lesser extent this also applies to the motive Challenge. For the motive Immersion, the indicators which are a part of the experience value are more in number than any other motive. For Have a break the experience value is also more important than the utility indicators. The indicators are weighted, partly based on the results of the literature study and partly based on expert judgement.

## Results

The method was tested in a recreational park of 110 ha of the Dutch Forest Service. The land use is mostly forest with some open spaces and some ditches. There are many poplars and birches. Along the ditches nature is developed. There are trails and one cycle path. There is also a children nature playground. In the park, there are some references to the Roman period. The results of the assessment show that the park is more suited for the motive Have a break, and to a lesser extent also for the motives Interest and Challenge. The park is not very suited for the motive Amusement. Main reason is the lack of facilities such as restaurants and other meeting places such as barbecue and campfire places in the area. There are no marked trails. To a lesser extent the park is also not suited for the motive Immersion. The biodiversity is not high enough. It is not a real wilderness, it is too much designed.

## Conclusions

Although the translation into concrete managerial items is not doing justice to the scientific complex relationship between motives, recreational use and nature conditions, the method is a practical tool for managers. By enlarging the motives and the features, the preferences of divers target groups becomes more understandable. It helps in the communication about (desired) recreational use. The result of several meetings with park managers was that they understand and recognized the motives.

Research on motives helps managers understand why and how people make decisions about travel to their area. It give the manager an simplified insight into the physical elements, products and services he could develop to make the park more suitable for recreationists searching for an experience based on a certain motive. Advertising can focus on those attributes in order to persuade the potential recreationist toward specific destinations or activity choices.

Table 1. Amount of indicators per motive

Indicator	Amusement	Have a break	Interest	Immersion	Challenge	Total
Information	14	7	12	8	10	18
Accessibility	8	5	5	5	7	9
Utility entrance	22	5	10	9	12	39
Experience value entrance	6	5	4	5	3	11
Utility park	32	16	18	8	21	57
Experience value park	24	33	32	36	12	56
<b>Total</b>	<b>106</b>	<b>71</b>	<b>81</b>	<b>71</b>	<b>65</b>	<b>190</b>

With this, managers have a tool to guide visitor flows to those areas which are most suitable and/or away from more vulnerable parts.

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# An integrated visitor experience opportunities concept for Fundy National Park and partners

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With visitation decreasing in national parks and protected areas across North America, efforts are being made through social science to better understand these trends and to identify ways in which to match travelers with the kind of experiences they seek. Given the global economic picture, travelers spend more and more time in deciding and look for increased value and new and improved products before making vacation expenditures – success in the future in the extremely competitive world tourism market means being innovative today.

This, coupled with Parks Canada's commitment to provide the quality opportunities for meaningful connection with the essence of Canada's nature, culture history and people, was the impetus for a new approach. Building on the Bay of Fundy's recent recognition as one of the world's top twenty-eight natural wonders, Fundy National Park, the conservation core of the UNESCO designated Fundy Biosphere Reserve, developed an integrated Visitor Experience Opportunities Concept (VEOC) for the upper Bay of Fundy region in conjunction with its three key provincial partner sites; Hopewell Rocks, Cape Enrage, and Fundy Trail Parkway. The timing of this initiative was felt to be optimal due to the fact the province of New Brunswick, the overarching partner in this endeavor, was one of the two Canadian provinces in addition to Parks Canada who had recently purchased the rights to use the CTC's EQ tool and use it as a basis upon which to base their tourism investment decisions.

The VEOC is effectively a collection of ideas, dreams and initiatives, some immediately and easily implementable others implementable in the future when resources and new technologies permit. The process included a series of two-day workshops using social science and segmentation tools, in particular, the Canadian Tourism Commission's Explorer Quotient (EQ) to identify traveler traits and preferences with the goal to diversify experiential tourism opportunities for the nine specific traveler types. The basic principle of EQ is that the guests' social values and lifestyles have the most weight with respect to their travel and activity choices. It explored both innovative ideas and enhancements to existing offers and served as the basis for strategic investments with respect to opportunities for enhanced visitor experience. Thinking about the future made it easier to believe that the impossible will be possible. One of the main principles of the process was to concentrate on the "what" and the "why" and not to get lost in the details of the "how". The "who" question was addressed through guest segmentation using the EQ types.

Each of the four sites was dealt with through its own workshop with the discussions systematically addressing

one explorer type at a time through the following questions: why would this EQ Type of guest explore this area; where are existing or potential experience opportunities for this EQ type; how can we enhance existing places, access, programs, services; how can we provide innovative support for experience opportunities; how can we improve together? Participants were selected for their diverse backgrounds and ranged from local business owners, provincial tourism officials, Aboriginal partners, restaurateurs etc. They were initially each asked to recollect their best personal travel experiences. While the experiences and destinations all differed the value placed on their connection to place and to their hosts was highly and commonly valued. Through facilitated discussion, the participants looked at the guests' desired activities and destinations from a host's perspective and explored themes that they felt would be most attractive, exploring one EQ type at a time. The premise was to move the identification of potential new or enhanced opportunities from mass thinking based upon traditional demographic information and empirical knowledge of guest services towards a mind-set of responding to the social values and travel traits of individuals.

The resulting document identified a wide range of enhancements and innovations for each of the individual partner sites as well and a number recommended of joint initiatives through which visitor experience opportunities could be augmented.





# Windpower in a nature-based tourism area – green energy or landscape disturbance?

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## Introduction

The demand for nature-based tourism has created new economic opportunities within regions rich in natural amenities, such as Northern Europe. In Finnish Lapland, for example, tourism has become the most important economic sector, now providing more job opportunities than the forest sector. Nature and landscape quality is one of the pull factors of Nordic nature-based tourism and therefore, it is important to understand people's experiences and perceptions of their recreation environment and what type of changes are not desirable from a tourism point of view. Natural scenery, experiences of nature, authenticity and service quality are identified as factors that attract tourists to resorts in rural and peripheral areas, both in Finland and elsewhere in Europe.

In recent years in Finland, government policy measures have strongly encouraged renewable energy production, including the construction of windparks in various regions in Finland. One of the most controversial environmental effects of windpower is, however, its impact on the quality of the landscape. Concerns around landscape deterioration are currently high on the agenda in public debate among summer cottage owners, recreationists and nature-based tourism entrepreneurs. In Finnish Lapland, the relationship between windpower and nature-based tourism is a timely issue, as almost twenty windparks are currently planned for development in Lapland. At the same time, the Lapland tourism strategy aims at doubling the amount of foreign visitors by 2020. So far there are few studies that address the acceptability of windpower from the nature-based tourism point of view in the Nordic countries (e.g. Hörnsten, 2002; Heiberg, Aall and Tveit, 2009). Therefore, a deeper understanding of the synergies and conflicts between nature-based tourism and windpower is needed to improve land-use planning and allocation of windpower parks in regional planning.

This presentation reports on the main results of a survey among foreign and domestic nature-based tourists regarding attitudes towards windpower development in Finnish Lapland. The main goal of the study was to evaluate the impacts of the construction of Mielmukkavaara windpark, located in the Muonio tourism region in northern Lapland. The study investigated the effect of the windpower park on the quality of recreation experiences and on the attractiveness of the destination for nature-based tourism.

## Methodology

The data consisted of 252 onsite interviews in Lapland during the winter and spring seasons 2010–2011. 71 per cent of the respondents were foreign and 29 per cent were

domestic visitors. An additional 150 responses from domestic tourists were collected during autumn 2011. The respondents were asked about the characteristics of their trip, motivations to choose Muonio as a travel destination, and their general attitudes towards wind power development. The respondents also evaluated 16 original and edited photographs presenting views of the planned Mielmukkavaara windpark with and without turbines, in order to assess the impact of the park on recreation and tourism activities. Moreover, foreign and domestic tourists were interviewed using the focus group method to get a deeper insight regarding windpower development in Muonio. A total of 27 people participated in the interviews.

## Results of the visitor survey

In general, the tourists considered windpower to be an environmentally friendly energy production solution. The international tourists, however, were somewhat critical of the acceptability of windpower in the vicinity of nature-based tourism areas. The evaluations of the original and edited photograph images showed that wind turbines would reduce the area's suitability for recreational and tourism activities. Thus, the majority of the international respondents thought that Mielmukkavaara windpark should not be built.

Moreover, the proposed Mielmukkavaara windpark was assessed to have a negative effect on the image of Muonio as a nature tourism destination (Figure 1). Foreign tourists – from the Netherlands, Belgium and the UK in particular – felt that that windpark would weaken the image of the Muonio region as a tourist destination. From all the respondents, 60 per cent stated that a windpark in Mielmukkavaara would significantly or somewhat worsen the image of the area as a nature tourism destination.

Compared to international visitors, Finns were more willing to accept windpower development in Lapland and the construction of Mielmukkavaara windpark. Among the domestic respondents, the share of advocates for the windpark was larger than the share of those who were against the building of Mielmukkavaara windpark. Some of those that were in favor even thought that wind turbines can act as landmarks which aid orientation in the wilderness.

## Discussion

The results show that foreign tourists have a somewhat critical attitude towards wind power in the Muonio area. This is partly understood by the fact that safari entrepreneurs currently use the proposed area for development for various types of safari, which are mainly used by foreign tourists. Moreover, the negative attitudes may be a result of intensive

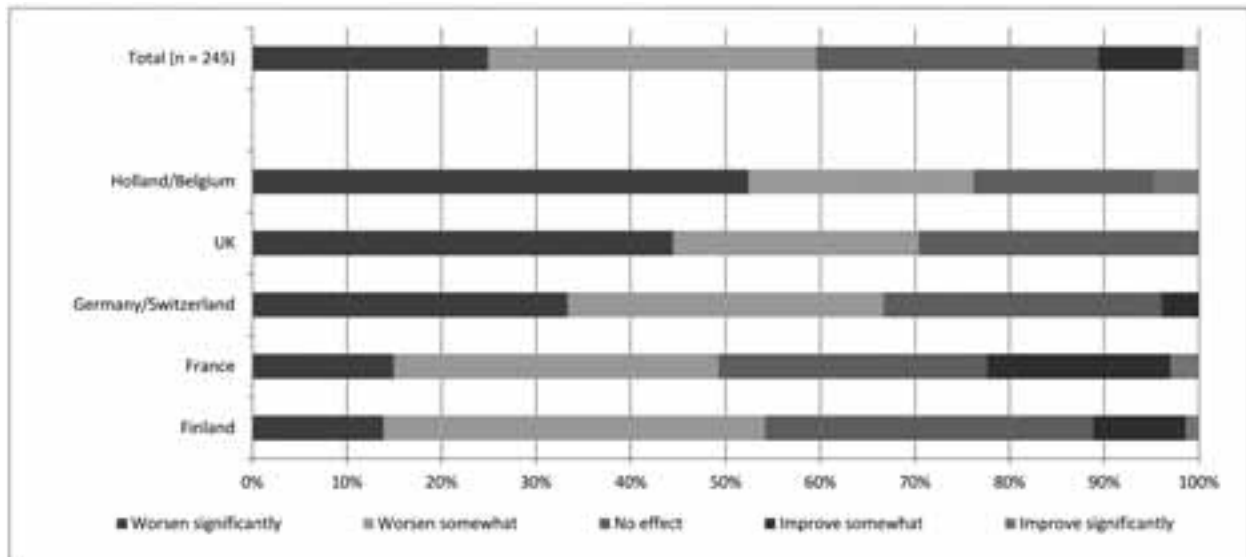


Figure 1. The respondent's assessment of the impacts of Mielmukkavaara windpark on the image of the Muonio area as a nature-based tourism destination.

wind power development in the clients' home countries.

The findings call for the definition of more specific criteria for planning and allocating wind power parks in nature tourism areas. It is suggested that the proposed Mielmukkavaara windpark would have negative effects on safari tourism, which is largely dependent on foreign tourists. The importance of foreign tourism is particularly significant in Muonio; it represents two-thirds of all overnight stays in the region. The most commonly mentioned reasons for the negative effect of windpower are related to its visual impact on the landscape. These effects could be mitigated to some extent by changing the route networks used by safari entrepreneurs where possible.

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## ORGANIZED SESSION: ORAL/ROUND TABLE

## Nature and health

Session organizer: **Lisa Bergström**, Friluftslivets fellesorganisasjon (FRIFO), Norway, [lisa@frifo.no](mailto:lisa@frifo.no)

The purpose of this session is to raise the question that outdoor recreation in different forms is a valuable resource and *could act* as a utile tool for better public health *if* society would let it. We will give you some answers why this is urgent and in what way nature is a resource in this context. How can we together make politicians more interested in this work? If time permits, there will also be a round table discussion on this topic.

Moderator is Lisa Bergström, project leader of "Healthy in nature": [www.friskinaturen.org](http://www.friskinaturen.org)

# Outdoor Education – the hidden classroom in urban green settings

Anders Szczepanski, Linköping University, Sweden, anders.szczepanski@liu.se

This presentation describes the educational potential of the green city environment, parks, school grounds and botanical gardens – the extended classroom's importance for children and young people's wellbeing and how the indoor and outdoor environment can interact in the learning process. Perspectives of where, what, why, how and when? Place based reflection and learning in and through landscape, knowledge and reflection in actions that brings us back to the hidden classroom.

## Theoretical background

With a pedagogy based on *sensory experience*, learning would probably have a deeper approach. Direct physical contact with natural and cultural phenomena increases the *authenticity* in learning by providing a link to an approach that should reasonably be innate in human beings. We learn not only by seeing and hearing but also by smelling, feeling, tasting and touching; “to grip to grasp”, to use a metaphor for the distinctive character of outdoor education. We argue that in the authentic encounter with the outdoor environment there exists an important source of motivation for meaningful and creative learning processes (Dahlgren & Szczepanski, 1997, Szczepanski, 2008). The research group at the Centre for Outdoor Education at Linköping University, has proposed the following definition in an attempt to describe the field of outdoor education in the context of landscape:

- Outdoor education is an approach that aims to provide learning interplay between experience and reflection based on concrete experience in authentic situations.
- Outdoor learning is also an interdisciplinary research and education field, which involves, among other things (National Center for Environmental and Outdoor Education, 2004):
  - the learning space being moved out into life in society, the natural and cultural environment,
  - the interplay between sensory experience and book-learning being emphasised,
  - the importance of place being underlined.

A characteristic of the distinctive nature of outdoor education is action-oriented learning, which emphasises *development of knowledge through activity*. Further, the natural environment (landscape) is regarded as both the *place* and the *object* of learning. We also see outdoor education as a *way* of learning. Learning in the cultural and natural environment is more than an opportunity for fresh air and exercise. Linguistic concepts are incorporated through firsthand experience and direct physical contact with the phenomenon out of doors. Outdoor education enables interaction between emotions, actions and thoughts to take place. In

the institutionalised school, the classroom often limits this interaction.

Outdoor education has the prerequisites to become an integrative, complementary education form in a pragmatic and progressive pedagogy tradition by offering students and teachers opportunities to learn based on observations and experiences in authentic situations (Szczepanski, 2008).

We should create the necessary conditions for learning in interaction between text (book-based learning) and non text-based practices (sensory experience) where physical activity and movement can support learning. The identity of outdoor education can be found in both *edited*, arranged environments such as botanical gardens, zoos and natural and cultural history museums prepared for educational activities and purposes.

It can also be found in *unedited* environments such as our cities, cultivated, forested and water landscapes. Outdoor education is a theoretical perspective, one of the few – if not the only – example of how a pedagogy is defined with one expression, which specifies learning's location: its *where*. Outdoor education's *didactic identity* is determined by the fact that the physical natural and cultural environment (landscape) furnishes the content of learning, i.e. the identity of the phenomenon outdoor education is characterised by actual physical presence also by its holistic nature. Outdoor education is, however, not automatically more holistic than traditional classroom teaching. In the hands of an unaware educator, reality itself can be exposed to fragmentation. The experience, in every sense of the word, is often specific and situated (Dahlgren & Szczepanski, 1997):

Reflection is required to be able to transform experience into knowledge. We argue that the distinctive nature and identity of outdoor education has a potential, as if it is realised through educational awareness, that can benefit meaningful learning (Ibid, p. 40).

With outdoor education, a more movement-intensive form of learning is created in preschool and school, which is currently supported by several scientific studies focusing on our relations to the physical environment (e.g. Grahn et al., 1997). Through the way we have built society, we have eliminated people's natural need of movement and this is probably one of several reasons for the high ill-health figures in society. It is reasonable to assume that the desire to learn is dependent on the feeling of health and wellbeing. The curriculum supplements in these areas are a consequence of a growing number of reports pointing to changes in both health risks and life style. Children do not get enough exercise and gain weight. Since all pupils spend a large part of the day in school, the school's ways of arranging lear-

ning play an important role in the development of their health and ability to learn (The Swedish National Agency for School Improvement, Curriculum Supplement, 2003).

In view of the conditions in modern society, it is important that spaces for outdoor education are created in our urban green environments. Biological and ecological diversity should be increased in parks, green refuges and schoolyards together with opportunities for greater contact with this diversity (Björklid, 2005, Dahlgren, & Szczepanski, 1997/2007, Lindholm, 1995, Szczepanski, 2008, Åkerblom, 2004). Today, the densification of our living environments often eliminates the green areas around the cities, which are replaced by shopping centres, residential accommodation, roads and multi-storey car parks. This trend does not promote the health factors in the relationship between humans and the physical environment. Today's society also

creates school environments in preschool and school, which far too often lack green areas for playing and learning (Danielsson et al., 2001, Mårtensson, 2004, Sandberg, 2002).

When the protective fences increase, the individual is also separated from the surrounding world and access to more movement-intensive learning environments. Today, the principal movement arena for children and young people often consists of a triangle comprising the home, the shopping centre and school. From a health promotion perspective, we must thus begin to think about how the whole education system can help to break this "triangular life form" and create other communicative environments for learning.

# Healthy parks healthy people Finland

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## Introduction

Natural settings can contribute positively to human health in a variety of ways. They may provide medicinal resources or important settings for recreational activities that improve people's physical and mental health. Parks and other green spaces can reduce crime, foster psychological wellbeing, reduce stress, boost immunity, enhance productivity, and promote healing. Multiple benefits can also arise from brief encounters with nature or experiencing nature on a smaller scale in settings such as in urban parks.

In recent years, many park management bodies have resolved to enhance such health benefits. One good example of such progress is the *"Healthy parks, healthy people"* concept, launched by Parks Victoria in Australia. Programmes with similar messages have also been introduced by other agencies such as the U.S. National Park Service and Natural Heritage Services in Finland. The concept is based within park management bodies, but it also involves managers of other kinds of green spaces, as well as business innovators, health care professionals, scientists and NGOs interested in public health.

## Healthy parks healthy people Finland

Metsähallitus Natural Heritage Services (NHS) manages all of Finland's national parks, other state-owned protected areas, wilderness areas, national hiking areas and public waters. NHS works to improve public well-being and the viability of tourism, as well as the state of biodiversity in Finland. In 2010 NHS launched Finland's Healthy Park Healthy People programme with the overall aim that: *Public health will improve as people get out into natural settings, enjoy positive and genuine experiences, and improve their physical health through a wide range of outdoor activities.*

The programme has nine more specific objectives covering four key issues: 1) strategic partnerships, 2) research and monitoring, 3) the accessibility of green spaces, and 4) nature and health for people of all ages. The programme is to be implemented all around Finland, and it also has strong national and international dimensions. One expected outcome is new methodology to improve our understanding of health benefits of green settings and our ability to monitor related progress. International cooperation will play crucial role, as this challenge is global in scope. Park managers have been assigned to join public health forums, since in addition to protecting essential ecosystems and biodiversity, parks also provide a vital setting for health promotion and the creation of wellbeing.

## OpenAir in Oulu region

Oulu is the largest city in northern Finland, with a population of about 250,000. The city's demographic structure is younger than many other localities in Finland and also

in comparison with other European cities. This is a great advantage, but at the same time the region is facing public health challenges. Health inequality is rather high, and occurrences of common Finnish health problems are more frequent here than in most other regions of Finland. Such health problems have probably had some connection to an increase in relative poverty among young families over the last 15 years. For example, more than half of local children do not get enough exercise, and mental health problems are increasing among young people. On the plus side, Oulu is an excellent location to deliver a Healthy Parks Healthy People programme, as the region is blessed with many attractive protected areas and other natural settings.

Metsähallitus NHS has launched the OpenAir development project (Oulu Parks, Enjoying Nature – Activation, Interaction, Recreation) in collaboration with the local health and administrative authorities, research organisations and NGOs.

The project aims to get key actors in the Oulu region involved in international and cross-sectoral networks that will capitalize and promote measures to enhance the health benefits of green spaces. The project has also launched the "Oulu Parks" concept to activate people, to remove barriers hindering the use of green spaces, and to diversify the recreational spectrum. The guiding idea is that nature, outdoor life and the related benefits should be accessible to everyone, which would reduce health inequalities.

National and international cooperation can provide a framework for spreading innovations and sharing good practices. Research cooperation can increase our understanding of the health benefits of recreation in green spaces and help to create efficient methods for monitoring these benefits. Other outcomes of the project should include a wider recognition that parks and other green spaces are integral elements of the quality of life, and a better understanding among health care professionals and policy-makers of the importance of the quality of the natural environment.





Oulu Parks, from urban Parks to Wilderness areas and National Parks

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# Care farming – using the farm environment for rehabilitation

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Green care includes a diversity of interventions and is based on the hypothesis that there is a positive relationship between nature and health. The concept includes therapeutic horticulture, animal-assisted therapy, care farming, green exercise, ecotherapy, wilderness therapy, e.g. In care farming (also called social farming or green care farming) commercial farms and farms connected to health institutions serves as an arena for rehabilitation, vocational training or pedagogical interventions through participation in normal farm activity. In Norway, approximately 1000 ordinary family-based commercial farms offer services to a variety of user groups. The farm and its surroundings arena offer a diversity of possible activities such as horticulture, animal interactions, ordinary work tasks, social interaction with others, and natural environments for recreation. There is a limited amount of studies investigating the effect of care farming, but a few studies on patients with dementia, depression, and other psychiatric diagnoses have been published. The results from these studies show moderate positive effect on activity levels and nutrient intake in pa-

tients with dementia, positive effects on depression, coping ability, quality of life and mental distress among patients that engaged in an animal-assisted intervention with farm animals. Therapeutic horticulture in farm environments has been shown to decrease depression severity and improve perceived attentional capacity in patients with clinical depression. The positive mechanisms and active components of different care farming interventions might be several, and involves the feeling of being away and fascination, the high variation of different work tasks, and the possibility to engage in adapted work tasks. The high flexibility on a farm makes it possible to switch between different tasks and activities according to the symptomatology of patients. The proposed presentation will give an overview of the research on care farming in Norway.



# Understanding the healing function of urban forests in Germany and in Korea

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## Status of forest recreation in Korea: Factors and conditions

After the post-war Industrial Development in Europe in the second half of the twentieth century, “Green” was used to refer to quality of life (Küster, 1999: 331), and since then forests and green areas have played an important role in Europe, ensuring the mental and physical health of its citizens.

In contrast, Korea has also experienced rapid industrial development after WWII; however, interest in the natural environment has only recently started increasing. The first recreational forest was designated in 1988, and has been followed by, to date, 145 such areas (Korea Forest Service, 2011: 374). Koreans work approximately 160% more than Germans (2,316 hours/year as opposed to 1,433 hours/year), and they have limited and rare experiences of nature and recreational activities (OECD, 2009: 272). To satisfy the general public’s high demand, these recreation programmes were planned and distributed nationally, rather than locally. While having certain time benefits, this has failed to highlight the individuality and uniqueness of different areas. Korea’s urban forest amounts to about 1,102 ha, accounting for 17% of the total forested area; moreover, 44% of urban land area is classified as urban forest, but the actual area that citizens can use is only 2.3% (7m<sup>2</sup>/person) of urban land area. These forests have poor accessibility, meaning the local citizens have fewer chances to experience nature.

## Latest issue of forest recreation: Healing – raising issues

In Germany, forests’ healing properties are considered to be part of their many-faceted role in maintaining health, rather than being recognized as having a special medical function. However, in Korea, forest healing is recognized as an innovative concept, and studies on the effects of the forest from medical viewpoints – clinical pathological effects, including forests’ to depression, stress, hormones, skin diseases, and learning capabilities – are currently in progress.

This study aims to apply a comparative analysis of the contrasting awareness of the healing function of forest recreation patterns in urban forests in Korea and Germany.

## Individual interviews: Materials and methods

In total, 16 urban forests in Berlin, Hannover, and Freiburg were selected to be surveyed in Germany, and 9 urban forests in Daegu, Daejeon, and Seoul were selected in Korea. A face-to-face survey method was used. A total of 458 interviewees – 154 in Germany and 304 in Korea – were selected. 23 research questions were developed in the following categories:

1. forest recreational behavior;
2. satisfaction with urban forests; and
3. the healing function of urban forests. The Likert five-point scale was used.

## A survey of the awareness of the healing function of forests: Results and interpretation

### Urban forest recreational behavior

In Germany, 57% of respondents who visited city forests answered that it took them 15 minutes to reach the forest, and 62% answered that they rode a bike or walked to the forest. Regarding accessibility, 65% of respondents indicated a high level of frequency of visits to forests.

In contrast, for 29% of respondents in Korea, it took 15 minutes to reach the urban forests. In particular, 13% answered “I need more than 1 hour,” and 50% answered that they drove to visit forests. Half of the visitors went to the forest less than 4 times a year, revealing a wide difference in the way urban dwellers in the two countries experience forests.

Regarding motives for the visit and which activities were undertaken, general recreation and “going out” accounted for two-thirds of visitors in Korea, but Germany showed diverse motives and activities, including, forest environmental education, sports and wildlife, walking with companion animals, learning, experiencing nature, meditation, and taking a break during office hours.

### Nature experience and satisfaction

In Germany, only 18% of respondents answered that it was possible to experience nature in urban forests, and 47% answered they recognized urban forests as a created green space, not nature. In South Korea, 76% of respondents answered they were satisfied with their nature experience in urban forests, and 30% of them were “very” satisfied. As for the recreational function of urban forests, 86% of respondents in Germany and 73% in Korea were positive.

Although they were less satisfied with the recreational function and facilities of urban forests, Korean respondents were positive about the quality of their nature experience. Although they assessed the quality of nature experience in urban forests rather negatively, German respondents were, however, satisfied with their recreational function.

### Awareness of the healing function of forests

Most visitors in Germany answered they were very confident of the healing function of forests (95%) and 92% of German visitors were positive about the physical healing effects of forests. 77% felt sure about the healing function

Table 1. A survey of the awareness of the healing function and nature based recreation in Korea and in Germany

Research Categories		S. Korea		Germany	
Character of Visitors	Visit Frequency	1~4   times/week times/year	29% 48%	1~4   times/week times/year	65% 12%
	Stay time	1~2 hours 3~4 hours	50% 46%	1~2 hours 3~4 hours	55% 26%
	Transportation	Walking Bicycle Public transportation Automobile	19% 3% 28% 50%	Walking Bicycle Public transportation Automobile	34% 28% 13% 25%
	Required time to reach	5 min. < 15 min. < 30 min. 1 hour	6% 23% 42% 13%	5 min. < 15 min. < 30 min. 1 hour	19% 38% 39% 4%
	Motivation, Activities	Relaxation, Family, Sport	Hiking children 64% 13% 8%	Relaxation, fresh air Hiking Sport Family, children	28% 13% 10% 9%
	Visit type	Family Alone	50% 12%	Family Alone	53% 40%
	Sex	Female	53%	Female	50%
	Age	30~49	50%	20~39	52%
Evaluation of Urban Forests*	Recreational Activity	1.97		1.53	
	Recreational facilities	2.36		1.75	
	Management	2.24		1.54	
	Nature Experience	2.02		2.14	
Awareness of Healing function*	Healing function	1.72		1.14	
	Healing function of urban forest	2.51		1.94	
	Psychological healing	1.68		1.16	
	Physiological healing	1.90		1.33	

\*These 2 categories were surveyed using a 5-point Likert scale, No. 1 indicates a very positive answer

of urban forests.

Although many Korean respondents were sure about the healing function of forests (81%) and their relation to physical healing (79%), only 56% of them agreed that urban forests also served a healing function, indicating a relatively low awareness.

### Results: Interpretation

The findings from the Korean survey indicate a low awareness about the healing function of urban forests, despite their high awareness about 1) motivations for recreation; 2) demand for recreational facilities; and 3) forest healing in general. This low awareness is likely due to the insufficient nature experience of Koreans, because of their long working hours and the poor accessibility of urban forests.

In contrast, in Germany, with diversified recreational activities and motivations for forest recreation, the visitors experience superior accessibility, leading to high recognition

of the satisfaction to be achieved from forest recreation, and the healing function of forests.

The survey shows a close correlation between the healing function of forests and the satisfaction that is to be gained from forest recreation, so these two factors cannot be considered separately. Therefore, to improve satisfaction from forest recreation, a study enabling visitors to have more and more meaningful nature experiences, by improving the accessibility of forests, is required.

# The outdoor recreation – environmentalism relationship

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Environmental sustainability is a common theme in contemporary public debate and research, and it is increasingly used to examine outdoor recreation and nature-based tourism (see for example McCool & Moisey, 2001). This research project focuses on the relationship between outdoor recreation and environmentalism and includes two general questions:

- i) whether and how environmentalism influences outdoor recreation preferences and participation,  
*and*
- ii) whether and how outdoor recreation related practices influence levels of environmentalism.

As the project is not yet completed, the paper presents results only relating to the first question but offers suggestions on how to proceed on the second.

## Influence on outdoor recreation

The question of whether and how environmentalism influences outdoor recreation preferences and participation has been the focus of two separate studies. The first study was based on data from a Swedish national survey (see for example Fredman et al., 2008) and took a broad view on outdoor recreation preferences. That study's results show that environmentalists behave differently in various ways when compared to those classified as non-environmentalists. This includes spending more time in the outdoors, claiming closeness to nature as a motive for outdoor recreation participation, possession of a second home as well as referring to outdoor recreation opportunities when choosing residential location. When it comes to recreational activities, environmentalists prefer those with little or no impact on the environment as demonstrated, for example, by their avoidance of extractive (e.g., hunting) and motorized activities (e.g. snowmobiling). Still, the findings were inconsistent in that while environmentalists avoid some extractive and motorized activities, other similar activities, such as fishing and motor boating, were not avoided.

Paradoxically, the study based on the Swedish national survey also found that environmentalists do not hesitate to travel from residential areas for participation in outdoor recreation, despite the ongoing debate on the impact of various transportation systems on global warming. Taking this result as a starting point, the second study went on to examine how environmentalists relate to the outdoor recreation landscape and what processes underlie choices relating to the use of natural settings. Data was gathered by means of focus group interviews with district boards, and a content analysis of the members' magazine, of the Swedish youth organisation Nature and Youth Sweden (Fältbiologerna), which combines a strong commitment to the environment with a great outdoor interest.

Findings show that the organization engages in various outdoor activities, preferably at natural settings characteri-

zed by the landscape qualities of natural quietness, and the absence of other people and other human impacts. These landscape qualities are defined within the organization's communicative contexts, such as the members' magazine and various social gatherings (indoors and outdoors), and reflect a continuing construction of social representations based on the core values and ideas of the organization. In these contexts, landscapes are classified and valued, and places are made by the defining, naming, and the ascribing of shared meanings. Thus, the representations provide a social and spatial orientation by which some recreational choices become more desirable, privileged, meaningful and understandable than others.

Nature and Youth Sweden engage in outdoor recreation to set and distinguish themselves socially and form a group identity. Therefore, it seems to be of importance not only to choose one environment over others, but to ensure a distance to those who represent the latter environments and the downsides of the society that they (environments and people) stand for. By doing this, a spatial and social distance is created to places and people that represent aspects of society that are in conflict with the organization's ideas, values and norms. The places are valuable as long as they maintain their qualities, of which the absence of *the other* is critical.

Nature and Youth Sweden is an urban based organization, and transportation by various modes, including motorized vehicles, is a requirement for visiting the preferred sites, characterized by pristine nature and absence of human influence. In fact, the perceived importance of going to these places for maintaining their identity as environmentalists implies a compromise with some of their environmental values. Still, the organization emphatically rejects air travel, which is agreed upon as being an unacceptable assault on the environment due to its sizeable carbon footprint.

In conclusion, the findings show that environmentalists are distinguishable within outdoor recreation in various ways, including their preferences for activities and natural settings.

## Influence on levels of environmentalism

The second research question of the project is whether and how outdoor recreation related practices influence levels of environmentalism. Within the Swedish outdoor recreation tradition there have always been elements of environmentalism, drawing inspiration from Romanticism and "close to nature"-ideals. This is particular evident when looking at Swedish outdoor organizations for youth where encounter with nature have long been viewed as a means of developing pro-environmental behavior. Moreover, results from a recent study on outdoor recreational habits among the Swedish population shows that for many people spending time in the outdoors implies "an improved understanding of nature's interaction and that all is connected" as well as a "feeling of being part of [this] nature" (Fredman et al.,

2008). Still, research has yet to find a clear causal relationship between encounters with nature and pro-environmental attitudes and behavior (Hockett et al., 2004).

The forthcoming study will examine the relationship between environmentalism and outdoor recreation as a relational process, which includes the interactions between the recreationist, her socio-cultural contexts and the recreational landscape. Using the perspective of Bourdieu (1984, 1990), outdoor recreation participation will be seen as both a practice deriving from the habitus of an individual and, simultaneously, as a way of constructing habitus.

Therefore, in the study it will be theorized that the elusive question of the outdoor recreation-environmentalism relationship requires an understanding of environmental behavior as a construct in constant making. This making occurs within the dynamic relations between individuals and their various interacting contexts, of which outdoor recreation may be one. In this perspective, by the way it facilitates and frames social formation and interpersonal relationships, the recreational landscape is seen as a space of social interaction.

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# Evolutionary and cultural influences on interactions with nature: a comparison of British and Chinese visitors to the New Forest National Park and Jiuzhaigou National Scenic Area

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## Introduction

The Biophilia thesis (Wilson 1984) proposes that people have a need to affiliate with nature. Evolutionary psychologists argue that humans have evolved in a natural environment and therefore the feelings, which visitors have in nature, one would predict to be universal. However visitors' attitudes to nature are likely to result from a co-creation of social and cultural influences, tested here as an urban or rural living environment and national culture (British or Chinese). This study sought to provide evidence in support of these two claims using a survey of visitors to the New Forest National Park, England and Jiuzhaigou National Scenic Area, China. The New Forest is the largest lowland heath in Europe, and the Park attracts about 3 million visitors a year. Jiuzhaigou is a World Nature Heritage site, which attracts 2.6 million tourists a year.

## Literature review

The literature suggests that there is not only a variety of structural and socio-demographic factors but also socialisation experiences through which people form their attitudes to nature and the environment. Urban residents are more concerned about the over-exploitation of natural resources (Arcury & Christianson, 1990). Whilst Berenguer et al. (2005) found that rural dwellers in Spain 'present more attitudes of environmental responsibility and greater consistency on expressing behavioural intentions compatible with the protection of the environment' (p. 128). The importance of developing bonds with nature when growing up, was established by Hinds & Sparks (2008) who demonstrated that in a sample of English undergraduate social science students, those who had rural childhoods reported stronger identification, more positive affective connections and more positive attitudes to the natural environment than those students growing up in urban areas. Harris (2006) claims that in China, more-educated, affluent and urbanised people have more pro-environmental attitudes.

## Methodology

Face to face surveys, using self-completion questionnaires containing the same questions, were undertaken in the New Forest National Park and Jiuzhaigou National Scenic Area. Following a back translation and piloting, convenience samples of 600 visitors in each park were requested to complete the survey. In China, 597 completed questionnaires were received and 408 in England with 964 questionnaires in total being usable for this part of the research project. An attitudinal scale, ranging from 1 = strongly agree/strongly

feel to 5 = strongly disagree / strongly not feel, was used.

Data was analysed using SPSS 19 and tested for differences between two independent groups on a continuous measure using the Mann Whitney U Test. The median scores were calculated (see Table 1) and where there is a statistically significant difference between nationalities, an approximate value of  $r$ , equalling the effect size, is also given. Using Cohen's (1988) criteria, 0.1 = a small effect, 0.3 = a medium effect and 0.5 = a large effect.

## Results and discussion

Beginning with the respondent profile, there were similarities in respect of gender and age between the two nationalities. In the Chinese sample, 59.6% were male, and predominantly between 26-45 years old (61.1%), whilst in the British sample, 60.3% were male and mainly between 36-55 years old (50.1%). 59.6% of the Chinese respondents grew up in a rural area and 33.8% now live in a rural area. Whereas 40.4% of British respondents grew up in a rural area and 66.2% now live in a rural area.

Taken as a whole, the participants disagreed strongly with the statement that nature is unimportant but agreed strongly that people are a part of nature and that conserving nature now is important for future generations. These results demonstrate the value of natural capital in people's lives.

There were some similarities (see Table 1) between respondents in the two countries in respect of how they felt in nature, for example, they all strongly agreed that nature is fascinating and powerful and agreed that natural places can inspire or have special meanings for them. However, there were also statistically significant differences (at a significance level of 0.5), between the cultural groups in terms of how they felt in a natural environment. The largest effect ( $r = 0.527$ ) of national culture was that though they both disagreed that natural places are stressful, the Chinese disagreed but the British *strongly* disagreed. There was a medium effect of culture in respect of the statement 'God gave people control over nature' with both the Chinese and British gave this a median score of 3. A similar medium effect was identified in terms of the statement, 'Natural places have a religious/spiritual value'. However, the Chinese agreed more with this statement than the British.

In respect of whether a respondent grew up in a rural or urban area and where they lived at the time of the study was also interesting. Their current place of residence revealed statistically significant differences in terms of urban or rural living in respect of five statements. Notably, all of these



Table I.  
Results

	Medium			Asym p. Sig.	Effect size ( $f$ )	Grew up			Now live		
	All	Chin- ese	Brit- ish			Rural	Urban	Asym p. Sig.	Rural	Urban	Asym p. Sig.
People ought to try & control nature	4	4	4	<b>0.000</b>	0.177	4	4	0.333	4	4	<b>0.003</b>
Natural places are dangerous	4	4	4	<b>0.000</b>	0.001	4	4	0.493	4	4	0.186
People can always repair any damage to the environment	4	4	4	<b>0.000</b>	0.281	4	4	0.494	4	4	0.320
Nature should benefit the economy	3	3	3	0.597	-	3	4	0.073	3	3	0.443
God gave people control over nature	4	3	3	<b>0.000</b>	0.301	4	4	0.241	4	4	<b>0.001</b>
People have a need to be in a natural environment	2	2	2	<b>0.000</b>	0.248	2	2	0.378	2	2	<b>0.001</b>
Conserving nature now is important for future generations	1	1	1	0.961	-	1	1	0.579	1	1	0.534
People are a part of nature	1	1	2	<b>0.000</b>	0.145	2	1	0.179	2	1	<b>0.001</b>
Natural places have a religious/spiritual value	2	2	3	<b>0.000</b>	0.238	2	2	0.931	2	2	0.142
Natural places are stressful	4	4	5	<b>0.000</b>	0.527	4	4	0.736	4	4	<b>0.000</b>
Natural places are tranquil	2	2	2	<b>0.000</b>	0.088	2	2	0.792	2	2	0.929
Natural places can inspire me	2	2	2	0.115	-	2	2	0.699	2	2	0.429
Natural places can have special meanings for me	2	2	2	0.248	-	2	2	0.939	2	2	0.244
Natural places are pleasing to look at	1	2	1	<b>0.001</b>	0.115	2	1	0.184	1	1	0.660
Nature is fascinating	1	1	1	0.065	-	1	1	0.177	1	1	0.678
Nature is powerful	1.5	2	1	0.166	-	2	1	0.253	1	2	0.665
Nature is unimportant	5	4	5	<b>0.000</b>	0.335	5	5	0.537	5	5	<b>0.000</b>

statements also showed statistically significant differences in terms of nationality, suggesting that there is some co-creation of attitudes. However, when the file was split by nationality, there were no differences between where they live now within each nationality, suggesting that national culture has greater influence.

Interestingly, unlike the results of Hinds & Sparks (2008), this study suggests that whether a person grows up in a rural area or not has no difference in respect of their feelings and attitudes to nature. This was also true when the file was split between nationalities – there were still no significant differences within the groups.

## Limitations

Whilst this study considered the views of a large cohort of respondents in each country, there are limitations with the sample. First, they were all visitors to an area of natural protection and therefore had some commonality of leisure interest. Secondly whilst nationality was taken as a variable the Chinese cannot be taken as a single homogenous group in view of tribal differences and the British are still divided by class, and so the concept of a national culture is contentious. Additionally standard socio-demographic variations of age and gender were also not considered. Further research could consider these aspects.

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# The role of ecological orientation for forest visitors' visiting motives, environmental preferences and recreation behavior

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## Introduction

There is good evidence that people generally prefer natural environments, for example, forests, over urban environments for restorative purposes (e.g., Hartig and Staats, 2006). In Switzerland, forests especially play a major role in the outdoor recreational behavior of Swiss residents and the use of forests for recreational activities is growing (e.g., Brändli, 2010; Hunziker et al., in press). With increasing numbers of outdoor recreationists the demand for a sustainable use and management of the environment also increases. In this context, it is important for managers, practitioners and researchers to not only understand what activities people perform when in the forests, but also what environmental attitudes these people hold. With the 'New Ecological Paradigm Scale' (NEP), Dunlap et al. (2000) presented a measure for the endorsement of an ecological worldview that distinguishes between environmentalists and non-environmentalists. It addresses environmental concern and pro-environmental orientation as general environmental attitudes. The NEP concerns fundamental beliefs about the balance of nature, limits to growth and human domination over nature (Dunlap et al., 2000). In the present study, we analyzed whether forest visitors' ecological worldview impacts their forest visiting motives, environmental preferences and recreational behavior.

## Methods

For our analyses we used data from a Swiss nationwide probability sample. A total of 9356 households were randomly drawn from Swiss telephone registers and contacted from October to November 2010. Respondents could decide on participation for a nationwide study concerning the human-forest relationship. The survey comprised of different topics, ranging from socio-demographics, environmental preferences, economical aspects, recreation behavior to visiting motives and general restorative benefits. Measurements used for this analysis included a short 10-item version of the NEP (Schultz and Zelezny, 1999) as well as measures for eight different motives for visiting forests (e.g., 'I want to experience nature'), different forest-related preferences (e.g. familiarity, fascination, infrastructure), perceived disturbances during forest visits, along with an open ended question regarding performed activities while in the forest.

A total of 3022 adults completed the survey, giving a response rate of 32%. Of them, 1792 filled in the online questionnaire and 1260 were interviewed via telephone. The telephone interviews averaged 39.46 minutes (SD = 25.7), while filling in the online questionnaire averaged 32.56 minutes (SD = 11.1). In the present study we were only interested in answers from respondents who actively

visit forests for recreational purposes. Thus, we had to exclude 189 individuals, giving us a final sample size of 2833 (mean age in years: 53, SD 15.6; 52.3% female).

First, we analyzed the factorial structure of the NEP items with a principle component analyses (PCA). Next, we focused on the relationship between the resulting NEP components and motives for visiting forests, preferences for different forest attributes, performed activities, rating of restoration, and perceived disturbances while recreating by correlation analysis. Additionally, we divided our sample into an anthropocentric and ecocentric group, whereas people who scored higher on the ecocentrism dimension than on the anthropocentrism dimension were labeled 'ecocentrics' and *vice versa* 'anthropocentrics'. Respondents who scored equally on eco- and anthropocentrism were excluded from the analyses.

## Results

The PCA resulted into two distinct factors, representing an anthropocentric and ecocentric worldview (Table 1). Mean score for anthropocentrism was 2.29 (SD = 0.69), for ecocentrism it was 3.26 (SD = 0.56), meaning that the majority of the sample favored an ecocentric worldview.

Further analysis revealed that ecocentrism was positively related to preferences for 'sounds of nature' or 'if it smells like nature'; to motives like 'I want to experience nature' and related activities; to a higher degree of self-reported restoration; and also to more frequently feeling disturbed by others while in the forest. On the other hand, anthropocentrism was associated with higher preferences for infrastructure (e.g. benches); more social- and action-orientated motives for visiting forests; lower self-reported restoration and less perceived disturbances by others.

Splitting the sample into an anthropocentric and ecocentric group resulted in significantly higher agreement for motives (e.g., I want to take a break from everyday life), a significantly higher intensity of forest use and amount of self-reported restoration and preference for diverse forest characteristics for the ecocentric group. These people also reported more frequently 'to take a walk when in the forest' compared to the anthropocentric group.

## Discussion and outlook

Our results suggest that having an ecological or anthropocentric worldview is meaningful for recreation research, because these worldviews are associated with (more or less) mutually exclusive preferences, motives and activities. This indicates that people have different demands concerning restorative environments; for example, ecocentric people want to experience nature while anthropocentric ones want

Table 1. Principal component analyses of the short version of the NEP.

Item	Resulting factor	
	Eco-centrism	Anthropocentrism
1 We are approaching the limit of the number of people the earth can support	<b>.57</b>	.07
3 When humans interfere with nature it often produces disastrous consequences	<b>.68</b>	-.07
5 Humans are abusing the environment	<b>.73</b>	-.09
6 The earth is like a spaceship with very limited room and resources	<b>.68</b>	-.00
8 The balance of nature is very delicate and easily upset	<b>.67</b>	-.15
10 If things continue on their present course, we will soon experience a major ecological catastrophe	<b>.68</b>	.02
2 Humans have the right to modify the natural environment to suit their needs	-.17	<b>.61</b>
4 Human ingenuity will insure that we do NOT make the earth unliveable	-.04	<b>.68</b>
7 Humans were meant to rule over the rest of nature	-.03	<b>.77</b>
9 Humans will eventually learn enough about how nature works to be able to control it	.10	<b>.76</b>

Note: n = 2833; Explained variance factor 1: 28%, factor 2: 20%, total: 48%.

to spent time with their family and friends. These results can be an indicator for a different concept of recreation, based on underlying worldviews. This implies a real challenge for visitor management, because management has to satisfy the needs of both ecocentric and anthropocentric people, usually within the same environment.

On the other hand, it is important to note that the NEP is a very general measure for a global worldview. It is neither clear how strongly actual preferences, motives and activities depend on global environmental attitudes, nor if the global environmental attitudes depend on preferences, motives or activities. Additionally, there is some uncertainty about the dimensionality of the NEP, because different studies resulted into one to several different factors when analyzing its factorial structure. Dunlap et al. (2000) suggested that the

dimensionality depends on the specific context. Therefore, it is recommended for future studies to not solely rely on one measure for a global environmental attitude, but to also take other measures that focus specifically on management, social aspects of visiting and physical characteristics of the environment into account, like for instance, the purism scale (Fredman & Emmelin, 1999).

Either way, our results contribute to a more integrated understanding of recreationists and may help to solve possible conflicts in visitor and recreation management, through visitor guidance that takes visitors' worldviews into account.

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# Nature-based outdoor recreation and environmental connectedness

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This study explores the question of whether a relationship exists between the constructs of friluftsliv and environmental connectedness. A deeper understanding of these ideas is an important starting point. The Nordic term friluftsliv is difficult to translate, the revised Swedish Outdoor Recreation in Change Program Plan (Friluftsliv i förändring, 2006) notes, “In this application even though we use the English phrase ‘outdoor recreation’ our focus is friluftsliv; we believe these terms overlap to a large degree, but that they are not entirely equivalent concepts” (p. 5). Henderson (2001) distinguished the ideas of friluftsliv and outdoor recreation by defining friluftsliv as “outdoor recreation with its heart within the land and linked to a tradition of being and learning with the land” (p. 32). This richness in definition is captured repeatedly in the literature of friluftsliv; consider the definition used by Öhman (2010), “Friluftsliv is an upbringing that in the first hand is about developing a personal relationship to nature from one’s own experiences” (p. 5). These descriptive definitions illustrate the challenge for native English speakers in understanding the cultural distinction between outdoor recreation and friluftsliv. Another example of the complexity in translating this cultural idea is in regard to access, or specifically, the universal access traditions in Sweden. Access to nature is an inescapable element of the Nordic relationship with the natural world and a fundamental part of friluftsliv (Sandell & Sörlin, 2008). Despite the noted richness and complexity, the phrase *nature-based outdoor recreation* was used as a definition for friluftsliv in this study to allow English readers access to the ideas while also allowing for operational exploration of the research questions.

Numerous terms are presented as reference to a general reference to the human relationship with nature in the literature of environmental education and conservation psychology including: connectedness, affinity, biophilia, ecological self, identity, inclusion, relatedness, sensitivity, and sense of place/place attachment. The related yet distinct terminology of environmental connectedness reflects the scholarly interest in this area of inquiry. The definition for environmental connectedness used in this study is based on the work of Mayer and Frantz (2004) who defined connectedness to nature as one’s “affective, experiential sense of oneness with the natural world” (p. 504). They noted that biospheric values and an empathetic response to the natural world are characteristics of this emotional or affective state. Following from the preceding definition, the connectedness to nature scale (CNS) was developed as a measure of an individual’s feeling in community with nature (Mayer & Frantz, 2004).

## Methods

As part of a preliminary analysis for this research, three items from the Swedish national friluftsliv survey were

used to create a criterion variable of environmental connectedness. The national survey was Project A of the broader research program, Outdoor Recreation in Change: Landscapes, Experiences, Planning, and Development, an interdisciplinary approach to the investigation of nature-based outdoor recreation in Sweden. The three items comprising the environmental connectedness construct or “EC,” were initially tested for internal consistency or reliability and validity. The results of this testing, showed consistent response, indicated high intercorrelation and construct validity (Beery, 2012).

Once the preliminary testing was completed, survey questions quantifying participation in nature-based outdoor recreation and the three-item EC variable were used to explore possible relationships between nature-based outdoor recreation and environmental connectedness. Research question 1 considered whether those respondents who participated regularly in nature-based outdoor recreation had higher levels of environmental connectedness than non-regular nature-based outdoor recreation participants. Research question 2 considered whether the relationship between participation and environmental connectedness held when accounting for the other variables (nature-based outdoor recreation participation as child, support for access, current residence, residence as child/youth, sex, age group, level of schooling, disposable income, and nationality). Research question 3 investigated if any of the predictors moderated the relationship between nature-based outdoor recreation participation and the other noted predictors. Research question 4 considered whether there was a significant relationship between frequency of participation in particular activities and environmental connectedness.

## Results

Results of the data analysis indicate that there is a significant and meaningful relationship between nature-based outdoor recreation participation and environmental connectedness even when controlling for other predictor variables (see Table 1). In addition, analysis indicates that age group moderated this relationship with the exception of the youngest age group studied (18-30). This grouping of young adults did not show a significant and meaningful relationship between participation in nature-based outdoor recreation and environmental connectedness. It is also found that activity participation by respondents showed a correlation with both environmental connectedness and age group; It is found that eight items shows a positive correlation with environmental connectedness (walking in the forest and country, pleasure and exercise oriented walking, dog walking, walking with poles, garden work, nature picnic and grilling, plant animal study/bird watching, and meditation/yoga in nature). Four of the eight positively significant activity items correlated with environmental con-

Table I. Summary of Regression Analysis for Variables Predicting Respondents' Environmental Connectedness

Variable	<i>b</i>	SE	$\beta$	<i>t</i>	<i>p</i>	<i>pr</i>	<i>sr</i>	$sr^{2**}$
Support for access	.133	.035	.104	3.785	.000*	.110	.103	.01
Nationality	-.040	.090	-.012	-.439	.661	-.013	-.012	.0001
Income	-.019	.021	-.026	-.914	.361	-.027	-.025	.0006
Sex	.179	.047	.108	3.849	.000*	.111	.105	.01
Participation as child/youth	.135	.034	.123	3.928	.000*	.114	.107	.01
Participation	.133	.030	.135	4.369	.000*	.126	.119	.02
Education	-.056	.036	-.047	-1.561	.119	-.045	-.043	.002
Age-group	.155	.024	.189	6.432	.000*	.184	.176	.03
Residence current	.014	.015	.027	.898	.369	.026	.025	.0006
Residence Child	.027	.015	.057	1.835	.067	.053	.050	.003

\* $p < .001$ \*\* $sr^2$  = squared semi-partial correlation

nectedness are also positively and significantly correlated with age group (walking in the forest and country, walking with poles, garden work, and plant and animal study/bird watching).

## Implications

The most important implication of this study is support for cultural understanding of the human relationship with nature. The literature of friluftsliv reminds us that a significant part of the human relationship with nature is embedded in cultural understanding. Further, another important implication is a special consideration of the generational differences in the results. The relationship between the regular nature-based outdoor recreational participation and environmental connectedness does not appear to apply to the youngest age group in this study. Do these non-significant results indicate a generational shift in attitudes? Or are the results a function of a long-term developmental process of environmental connectedness based on multiple factors

such as activity preference or experience in nature and not evident until well into mid-adulthood? Further research is needed to explore this outcome more fully. One possible explanation is that the historically recent intensification of urbanization in Sweden has contributed to this potential generational shift. An additional correlational analysis of the relationship between respondents' current residence and environmental connectedness ( $r = -.06$ ,  $p < .05$ ) shows a significant and negative relationship. This finding indicates a more densely populated residential setting correlates with a lower level of environmental connectedness. Does this example, or other possible generational factors, indicate a reduced experience of nature for young adults? And if urbanization is playing a role in a reduced connectedness to nature, can support for simple, walking-based and accessible activity participation be a method to promote environmental connectedness in urban settings?

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# Ethical recreation? Applying an ethical decision-making framework to the case of heli-hunting in New Zealand

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Natural resource issues often involve limited resources, but multiple constituencies, creating situations in which it is impossible for everyone to get what they desire (Smith and McDonough 2001:241). A particularly vexing issue for protected area managers is the allocation of visitor opportunities, these frequently becoming 'messy' problems i.e. multidimensional and complex, with competing stakeholders, and often involving tradeoffs between visitor satisfaction and environmental quality. Smith and McDonough believe that "Focusing on fairness may help to alleviate resource-based conflicts" (2001: 241), and in essence are calling for a more ethical approach to decision making around resource/opportunity allocation..

Currently, protected area managers are guided by legislation, policy, and a number of visitor management frameworks (e.g. Recreation Opportunity Spectrum; Limits of Acceptable Change). While some visitor management frameworks are implicitly based upon 'fairness', and may be loosely connected to ethics, the development of recreational activities within protected areas is more strongly linked to various combinations and considerations of: the environmental impacts of the activity; its effects on other visitors' experiences; or, increasingly, the revenue generated by the activity. The emphasis placed upon these criteria differs according to the politic of the day, which in turn is influenced by issues of power and access (to policy and decision makers), political expediency, the state of knowledge (what is known and unknown) about the recreationist and the resource, and the economy.

This paper explores the case for adopting a more fundamental applied ethics approach to visitor management decision making. Such an ethics approach may provide "...a pro-active mechanism for navigating the often uneasy tensions that exist between policy and application on the one hand, and various autonomous, self-interested groups on the other" (Fennell et al 2008: 64). As noted above, current visitor management is not strongly linked to ethical decision making. But to be fair, very little management across the natural resource or the services domains (or elsewhere for that matter) are rooted within moral philosophy. In the protected area recreation domain, ethics does get some attention, with proponents of such an approach sometimes calling for either a 'wilderness ethic' or a 'land ethic' to help guide recreation management decisions. Oelschlaeger (1995) for example, argues that much nature-based recreation is governed by the same anthropocentric orientation held for all nature. He calls for recreation to be recontextualised through Leopold's land ethic.

But ethical frameworks differ substantially in their approaches and outcomes i.e. who gets what, and how the environment fares in the process. So it is useful to consider a holistic (or hybrid) ethical approach to natural area

resource management decision-making. Decision making rarely takes place from one ethical domain with it being more likely that ethical agents employ a diverse mix of ethical views in deciding on what is the ethically correct path to follow (Reidenbach and Robin 1990). Fennell et al (2008) argue for the benefits of an ethical triangulation (deontology/teleology/existentialism) approach. They believe that those who commit purely to one theoretical approach over others rule out the acceptance of decision-making that is premised on multiple perspectives. Schumann (2001) also promotes a 'moral principles framework' consisting of five complementary moral principles: utilitarian ethics; rights; distributive justice; ethics of care; and virtue ethics. And to provide guidance within the business management realm, Jones (1991) has developed a 'moral intensity' framework that consider six dimensions of the moral issue under consideration.

Schumann (2001) acknowledges that people may be generally unaware of these various theoretical ethical approaches, but that they use them in everyday decision making. While this may be so, there is a case that where decision making involves public-domain, scarce-resources that this be more transparently and vigorously based on a comprehensive ethical framework. Such a framework may assist protected area managers in examining various perspectives and making informed choices about recreation activities/development and ultimately arriving at a proper (ethical) decision or action requires (Fennell et al 2008). The paper discusses such an ethical framework for evaluating and considering 'messy' recreational activities and their place within protected areas. The case of heli-hunting in New Zealand is introduced to illustrate how such an approach could be used.

'Heli-hunting' or, helicopter-assisted guided trophy hunting, is a niche tourism activity within some national parks of New Zealand. Hunters (usually wealthy middle-aged male Americans) are transported by helicopter into the habitat of the target species (Himalayan tahr and chamois) high in the mountains. The helicopter may then be used to herd and haze the animals into a position from which they can shot. Because of this, the activity has been criticized on animal welfare grounds, and labeled 'unethical' by NGOs and domestic recreational hunters, who use more traditional hunting techniques. Yet the activity is supported by protected area managers as a means of 'pest' control (tahr and chamois are both introduced species, and national park legislation calls for their extermination). It is also supported by the tourism industry as an example of a profitable niche tourism product. Heli-hunting can be seen as an innovative way to generate a high yield income from protected areas while also contributing to their ecological integrity.

However, heli-hunting is a recreational activity that is

ethically ambiguous, raising questions about: animal rights and welfare; equity of access to resources within protected areas ('new' versus 'old' users); the use of technology (helicopters) to undertake what were 'traditional' activities; and potential discrimination against recreationists (the heli-hunters) who may have age-related mobility-disabilities that preclude them using more traditional hunting practices. Thus a number of tensions are observed, that are currently being played out within the legal domain, as heli-hunting operators defend their practice. We present heli-hunting as just one example of a number of ethically ambiguous recreational practices observed within protected areas.

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## ORGANIZED SESSION: ORAL/ROUND TABLE

# Values of outdoor recreation – Economics, perceptions, attitudes and beyond

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The purpose of this session is to stimulate a discussion around the meaning of the concept of value in relation to outdoor recreation. The participants are invited to contribute with their disciplinary perspectives, either exemplified by case studies or by conceptual analyses. For a stimulating discussion, a multitude of disciplinary views are welcome, e.g. social and economic geography, economics, business administration, sociology, political science, pedagogics, psychology, demographics, anthropology and sociology. Similarly a multitude of applications are welcome, e.g. urban proximate outdoor recreation, nature based tourism, spatial planning, nature conservation and regional development. The session will start out with presentations by selected speakers. It will end with a round table discussion where all session participants are welcome to actively participate. The purpose is to obtain a deeper understanding on the interpretation of the concept of value in outdoor recreation studies.

# Valuing Estonian shores for outdoor recreation using landscape preferences and contingent valuation methods

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More than 40% of the world population (2.38 billion) live within 100 km of a coastal area and by 2025 this number may rise to 3.1 billion (Martinez et al 2007). This causes several conflicts of interest and value. Thus, public opinion of human impacts and recreational preferences of the coastline are quite widely discussed and studied (Fyhri et al 2009, Hunt & Haider 2004, Wolsink 2010, Zoppi 2007).

Estonia has a 3800 km long coastline out which 2% (76 km) is artificial and 98% is in a natural condition. Estonian shores are classified into 5 main types (Orviku & Granö 1992): till shore (1330 km, 35% of Estonian coastline), silty shore (1178 km, 31%), sandy shore (608 km 16%), gravel shore (418km, 11%), and cliffed shore (190km, 5%). Shore types are well known not only by scientists but also by the public. During the Soviet occupation all coastline was closed for the public and this is also the main reason of its high naturalness. After regaining independence, pressures from human activities on Estonian seashores have increased. During last decades Estonia has been facing similar problems as many other regions in the world. The government measures are implemented to preserve the shores in their maximum possible natural condition and make them available for recreation and tourism. However, often heated discussions emerge due to development and supporters of development claim that it brings more inhabitants and more money to the region. Supporters of protection claim that it will raise living standard of locals and make the region more attractive for tourists. Thus, there are needs for analyzing the coastline values from different perspectives.

## Sample and methods

The purpose of the current study was to investigate the public preferences of the shores for recreation and willingness of Estonian population to pay for preserving the Estonian seashore in its natural condition. A representative sample (1700 respondents) of the Estonian working-age population was interviewed. The questionnaire contained information on Estonian shores (market scenario), including colored prints with descriptions of all seashore types represented in the questionnaire. All the respondents were asked to read through the questionnaire, the market scenario and the seashore descriptions. After that, they were asked to answer the preference question: "Rank the shore types in accordance with the shore type you prefer to visit for recreation". Best preferred type was scored as 5 and least preferred as 1. The preference question was followed by willingness to pay questions: 1) "Do you agree that Estonian shores should be preserved in their maximum natural condition?" and 2) "In case you agree that Estonian shores should be preserved in their maximum natural condition, then how much are you willing to pay for this annually?"

Answers were asked to be provided for every seashore type separately. It was underlined in the questionnaire that although the answer did not presume actual payment, the respondents were asked to answer as truthfully as possible and considering their financial possibilities.

## Results

The question "Do you agree that Estonia shores should be preserved in their maximum natural condition?" was answered "yes" by 89% of all respondents. From 44% (till shore) to 27% (sandy shore) of all respondents willingness to pay was 0, thus the preferences scale represented the opinion of a much larger group than the contingent valuation study. Both methods proved that sandy shores are the most valued shore type. There is a demand, although quite uneven, for all main seashore types in Estonia. The highest average willingness-to-pay of the respondents is for sandy shores, 20.1 euros, which makes total demand ca 15 million euros annually. The lowest willingness-to-pay (7.2 €/y) and hence also total demand is for preserving gravel shores in their natural condition (5.4 million €). The total demand per 1 km of coastline is highest for cliff shores with 44000 Euros while sandy shores come second with 25000 Euros. The demand per 1 km of silty shore and till shore is significantly smaller – 6 and 5 thousand Euros respectively (Table 1).

The most controversial shore type in Estonia is the cliff shores. A large share of respondents pointed out its visual attractiveness while on the other hand many people were concerned about safety upon visitation. Important socio-economic indicators for willingness to pay proved to be age and income. By integrating the demand curve we received the result that annual total demand of the Estonian population for seashores in their natural condition is 42.5 million Euros.

## Discussion and Conclusions

Our preference study demonstrated priorities of all respondents while willingness to pay brought out many more details, but at the same time excluded more than a quarter of the respondents whose willingness to pay was 0. Thus, the combination of the two methods worked out well. The study demonstrated that seashores in their natural condition are regarded as very valuable environmental goods. The total demand for preserving Estonian seashores in their natural condition of 42.5 million Euros is notable and an important argument for better planning of the sustainable use of seashores and their resources. The findings also allow us to draw the conclusion that outdoor recreation and nature tourism are the most preferred usages of shores, which to some extent guarantees a sustainable preservation of na-

Table I. Total demand for shores by type and shore type preferences

Shore types	Coastline, km	Individual's average WTP, €/y	Total demand per 1 km, thousand €	Total demand, million €	Preferences mean 1=lowest 5=highest
Silty shore	1178	9.4	5.95	7.01	2,65
Till shore	1330	9.3	5.22	6.94	2,71
Cliffed shore	190	11.2	43.95	8.35	2,56
Gravel shore	418	7.2	12.85	5.37	2,53
Sandy shore	608	20.1	24.65	14.99	4,56

tural conditions, and at the same time enable public access. Economic, nature protection and organizational aspects of Estonian coastal recreation are required to be investigated further.

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# Psychological benefits of visiting national parks in Japan

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## Introduction

The role of national parks in Japan is to preserve beautiful scenic areas and their ecosystems as well as contribute to the health, recreation, and culture of society by promoting utilization of these areas. However, park management has tended to focus on conservation rather than utilization, because very few surveys have been undertaken on the psychological benefits that nature and its beauty bring to the people of Japan. Japanese researchers tend to select the forest environment as their research topic, studies that focus on satisfaction and benefits are still in the early stages (Ito, 2003). By contrast, research on the benefits of outdoor recreation is more advanced in Europe and the United States, and several studies have been conducted about managing activities and facilities to provide experiences that create benefits for individuals, the community, the economy, and the environment (Allen, 1996; Driver, 2008). However, the relationship between benefits and impressions which is defined as being deeply moved by beautiful and majestic scenery, is not known, because of the small number of studies focusing on impressive experiences in nature.

Thus, this paper aims to identify the characteristic psychological benefits enjoyed by the visitors to Japanese national parks and to contribute to the promotion of park utilization. The specific objectives are as follows:

- to identify the characteristic benefits gained from visiting Japanese national parks
- to reveal the relationship between benefits and activities
- to determine the relationship among benefits, impression, and satisfaction

## Methodology

Data for this study were collected through a self-administered questionnaire method in four popular national parks in Japan (Shiretoko area, Nikko area, Kamikochi area, and Tateyama area). Questionnaires were handed out to a random sample of visitors in the parks. Visitors were asked to fill them out after their visit and return them by mail. Data collection was conducted from July to October 2011. Questionnaires were returned by 6,006 visitors, resulting in a 31.9% response rate.

The questionnaire items consisted of benefits, impression, satisfaction, destination loyalty, visitor characteristics, and visit characteristics. A benefit is defined as a change that is viewed to be advantageous – an improvement in condition, or a gain to an individual, a group, a society, or another entity (Driver, Brown and Peterson, 1991). Manning (2011) provided a list of the potential benefits of recreation. The authors selected 12 benefits which were considered in regard to visiting national parks from the list. Furthermore, in this study, “richness of life” is viewed as an overall benefit. Benefits, impression, satisfaction, and loyalty were measured using a seven-point scale.

## Results

Benefits that had a six-point rating or above were “nature appreciation,” “enriching the mind,” and “environmental awareness and understanding.” These are the characteristic benefits attributed to visiting Japanese national parks.

Next, the authors examined the difference in benefits derived from various recreational activities. Prior to examination, factor analysis with promax rotation was used to explore the structure of 12 benefits. As a result, a scree plot indicated a two-factor solution. The two factors were labeled “zest for living” and “sense of familiarity with nature,” and all items had factor loadings of 0.40 or greater. A t-test was conducted to compare the mean factor score between the groups, that is, participants of each activity and non-participants. A statistically significant difference was found between the two groups for almost all activities. “Climbing,” “creative art,” and “camping,” especially, tend to lead to “zest for living.” On the other hand, “viewing scenery” and “hiking” lead to a “sense of familiarity with nature.” In addition, “viewing wild plants,” “viewing wild animals and bird watching,” and “visiting the visitor center” were reported to provide both benefits.

Finally, structural equation modeling (SEM) was used to examine the relationship among overall benefit, impression, and satisfaction. Satisfaction may have an effect on benefit (Driver, Brown and Peterson, 1991). The authors hypothesize that “Impression has a direct effect on satisfaction, and satisfaction has a direct effect on overall benefit.” As a result, impression has a strong effect on satisfaction ( $\beta=0.62$ ,  $p<0.01$ ); however, satisfaction has a weak effect on overall benefit ( $\beta=0.12$ ,  $p<0.01$ ). Impression has a direct effect on overall benefit ( $\beta=0.41$ ,  $p<0.01$ ). Furthermore, SEM is used to examine the relationship among overall benefit, “zest for living,” and “sense of familiarity with nature”; overall benefit was more affected by “sense of familiarity with nature” than it was by “zest for living.” Moreover, there is a greater effect on destination loyalty from overall benefit than from satisfaction.

## Conclusion

An analysis of the results leads to the following conclusions:

- “Nature appreciation,” “enriching the mind,” and “environmental awareness and understanding” are characteristic benefits attributed to visiting Japanese national parks.
- There is a relationship between benefits and activities. The types of benefits (“zest for living” and “sense of familiarity with nature”) are different for each kind of activity.
- Impression has a strong effect on satisfaction, and satisfaction has a weak effect on overall benefit. Impression has a direct effect on overall benefit. Hence, benefit is stronger influenced from impression which is the evaluation of a point, than from satisfaction

Table I. Difference in mean factor scores between participants and non-participants in 16 activities

activities	【Factor1】zest for living			【Factor2】sense of familiarity with nature		
	Mean factor score of "participants"	Mean factor score of "not-participants"	Difference in mean factor score	Mean factor score of "participants"	Mean factor score of "not-participants"	Difference in mean factor score
Viewing scenery	0.01	-0.17	0.18 *	0.02	-0.43	0.44 *
Viewing wild animals/birdwatching	0.16	-0.06	0.23 *	0.16	-0.06	0.22 *
Viewing wild plants	0.14	-0.15	0.29 *	0.15	-0.17	0.32 *
Hiking	0.08	-0.10	0.18 *	0.12	-0.13	0.25 *
Climbing	0.24	-0.06	0.29 *	0.07	-0.02	0.09 *
Boarding a boat/sightseeing cruise	-0.01	0.00	-0.02	-0.01	0.00	-0.01
Attending interpretive program	0.15	-0.01	0.16 *	0.10	-0.01	0.11 *
Visiting visitor center	0.16	-0.04	0.20 *	0.15	-0.04	0.19 *
Visiting shrine and temple	0.00	0.00	0.00	-0.08	0.02	-0.10 *
visiting tourist facility	0.06	-0.01	0.06 *	0.02	0.00	0.02
Creative arts (photography, painting etc.)	0.24	-0.04	0.28 *	0.18	-0.03	0.21 *
Eating in restaurant	0.05	-0.05	0.10 *	0.03	-0.03	0.06 *
Shopping	0.00	-0.07	0.16 *	0.00	-0.07	0.14 *
Bathing a hot spring	0.02	-0.02	0.04	0.00	0.00	-0.01
Staying overnight in park or in its vicinity	0.03	-0.02	0.05	0.00	0.00	0.00
Camping	0.22	-0.01	0.24 *	0.03	0.00	0.03

\*: p &lt; 0.05

which is the evaluation of all points. In addition, strong benefits contribute to the promotion of national parks utilization.

However, there are some limitations to this study. First, this study was conducted at well known parks in Japan. Second, this study did not examine the effects of visitor characteristics. Future research should investigate these issues.

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# The value of nature close to home for outdoor recreation in Sweden

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## Introduction

In Sweden there is a strong tradition of using nature areas for outdoor recreation. The Swedish people have the right of public access to nature for outdoor recreation. However, over the last century the population has changed from being predominantly rural to being mainly urban. The distance from home to nature areas for recreation then becomes an issue. In a study of preferences for distance to recreational forests in Sweden, Hörnsten and Fredman (2000) found that residents were willing to pay to avoid an increase in the distance to recreational forests. Similar results have also been found in other countries (Tyrväinen, 1998; del Saz Salazar and Menéndez, 2007). This study explores preferences and willingness to pay regarding outdoor recreation in different natural environments close to home, by means of the contingent valuation method. In order to include all nature that might also be considered urban proximate the maximum distance for these recreational visits was set at 100 km and the maximum length of the stay was set at 24 hours to exclude tourist visits and focus more on “every day recreation” (Becken, 2002; Naturvårdsverket, 2009).

## Methodology and some preliminary results

The data originated from a nationwide mail survey that involved 4700 randomly selected Swedish citizens between 18 and 75 years of age. The willingness to pay question was of the open-ended format. The respondents were asked to state the maximum amount of money they would be willing to pay to avoid losing their current level of outdoor recreation close to home.

The response rate was approximately 40%. About 60% of the respondents stated that they use nature areas close to their home for recreation and their average frequency of visits to these areas each year was in the range 70 to 85 times, depending on the delimitation of the sample. The average distance travelled to visit the most important nature area was about 15 km and the average time spent at the area was 3–4 hours. About half of the respondents had visited areas dominated by forests for recreation and the corresponding figure was about 25% for water dominated areas (see Figure 1). Multiplying the willingness to pay per visit by the visiting frequency suggested an annual mean willingness to pay of more than 7000 SEK (-US\$ 1000) for outdoor recreation close to home. The willingness to pay was found to be influenced by factors such as nature area type, degree of urbanization, and income.

## Discussion

This study indicates a willingness to pay for outdoor recreation close to home that is of the same order of magnitude as found in some other Swedish studies (Fredman et al., 2012). The willingness to pay for recreation in different nature types varies considerably. For example, the results suggest that nature areas dominated by forests are associated with a lower willingness to pay than some other types of nature. This may be due to forests often being visited closer to home and for activities that are less exclusive. Moreover, respondents in urban areas were found to have a lower willingness to pay for their outdoor recreation in comparison with respondents living in less urban areas. This could be due to differences in preferences, but also to a general shortage of suitable environments for outdoor recreation in more urban areas relative to less urban areas. The findings highlight the importance of nature types for close to home recreation. Furthermore, they highlight the importance of considering the supply of outdoor recreation opportunities as well as preferences of urban residents. This becomes an important issue when allocating land between competing uses in increasingly densely built environments. The results provide one input to the land use planning process by considering the demand for nature-based outdoor recreation close to home.

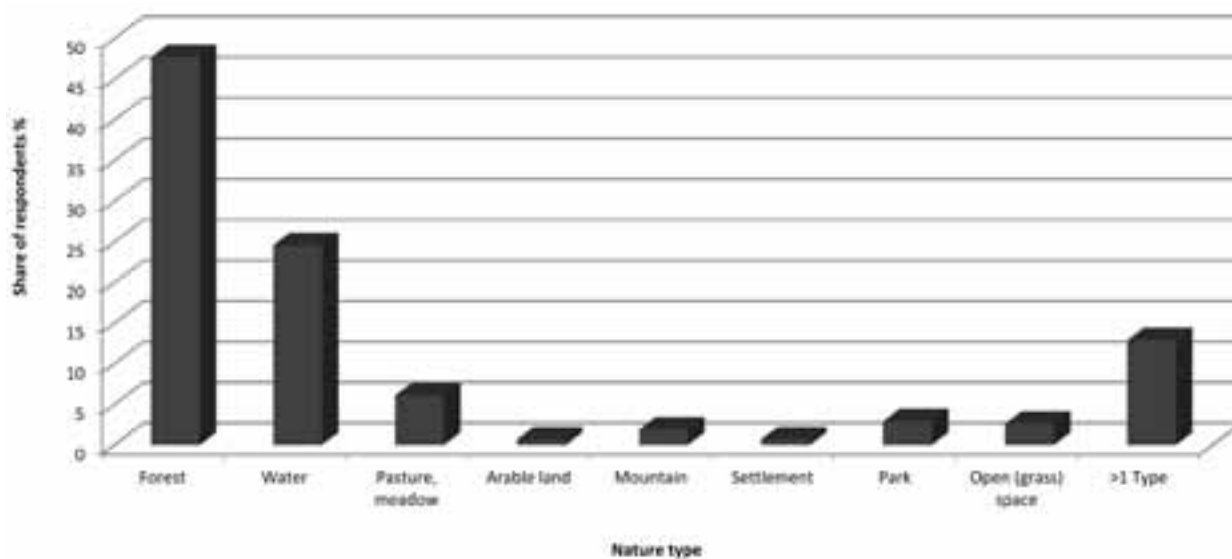


Figure 1. Distribution of respondents according to type of nature visited close to home (within 100 km and for less than 24 hours).

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# Forest-preferences and recreation in Switzerland: Results from a nationwide survey

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## Introduction

Around 30% of Switzerland's surface area is covered with forest and these represent an integral part of the population's everyday landscape. It is, thus, important for politicians and planners at all levels to know how the Swiss population relates to forests so that they can best promote and maintain various forest functions as well as habitat quality for the public. The relationship between the Swiss and their forests has been explored in several studies, particularly as part of the so-called "Socio-cultural forest monitoring" (WaMos) in 1997. In this report, the follow-up project, WaMos 2, is described. WaMos 2 explores the relationship between the population and the forest on three levels: (1) their attitudes to and (2) their knowledge about the forest and forest policies as well as (3) their behaviour, e.g. when visiting forests or buying wood. In addition, WaMos 2 is intended to develop the content and methodology of WaMos further, and establish it as a reliable tool for social forest monitoring.

## Method

To meet the above-mentioned goals, a representative survey of the Swiss residential population was conducted (N=3022, response rate 32%) by means of computer-assisted telephone interviews (with option to switch to a web-questionnaire, which was chosen by 41%).

## Results

### *Descriptive results of 2010 to be compared with those of 1997*

Study findings indicate that respondents value the forest's recreational function very high, but not as high as other forest functions like timber production, protection against natural hazards, and biodiversity. The forest's productive function was rated substantially more important compared to 1997.

We also found that respondents prefer the forest to be diverse, legible, coherent and mysterious. Study participants did differentiate between concrete forest attributes such as the existence of dead wood, species distribution, infrastructure elements etc. Most of the forest preferences indicated by respondents and aligned with what study participants perceived to be the actual state of forest conditions.

Most respondents tended to be wrong regarding their perception of the development of the forest area, i.e., to believe that it was decreasing instead of increasing in size. The proportion of people who assessed the development correctly has, however, increased markedly since 1997. The health of the forest was commented on very positively and

its development was assessed much more positively than in WaMos 1.

The findings about respondents' attitudes to forest ecology indicate that they perceive the forest as a habitat that is threatened. Not only was pollution mentioned as a threat but so too was housing development and climate change.

The majority of respondents assumed that natural hazards that cause damage are increasing, whereas in WaMos 1, a slightly smaller proportion expected such natural hazards to increase.

Turning to forest recreation, we found that the Swiss visit the forest on average once or twice a week in summer and once or twice a month in winter. This pattern has remained virtually unchanged since 1997. However, people today tend to engage in a wider variety of activities. This might explain that proportionally more reported being disturbed when spending time in the forest. But most said they nevertheless enjoyed it and felt recovered afterwards. Their motives for going into the forest appeared to be mainly to "experience nature" and to "being active and keep fit", as well as to a lesser extent to have a "social experience". These motives fit well with the activities they report.

### *Results of regression models to explain the observed attitudes of 2010*

How the Swiss relate to the forest in general is greatly influenced by their fundamental values, i.e., their general environmental orientation and their forest preferences, which affect almost all aspects of the human-forest relationship. Socio-demographic and spatial variables, such as forest ownership or how close the forest is to residential areas, appeared to have less influence on the human-forest relationship. Switzerland's regional division into different language regions and forest zones often affect aspects of the human-forest relationship. This means that regional characteristics and results specific to the region should be taken into account when designing measures and policies.

## Discussion of some methodical issues regarding monitoring

The objective of the project was not only to repeat the investigation carried out 13 years earlier, but to improve the questionnaire to become a more systematic and theory-driven monitoring instrument. Thus, there was the trade off whether the questionnaire items and scales should be improved, which meant that comparability with the data of 1997 was reduced, or leaving the items untouched which often implied accepting methodical problems that have shown up after 1997. We tried to find the right balance,



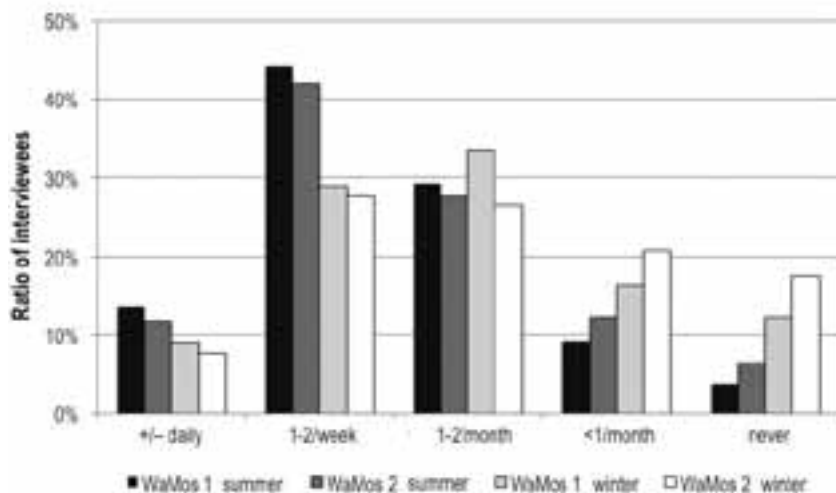


Figure 1. The frequency of forest visits did not significantly change from 1997 to 2010, neither in summer nor in winter.

but are forced in many cases to prevent ourselves and the target audience from over-estimating the differences, as the data were gathered slightly differently.

Another major issue is the reduced response rate, from 55% in 1997 to 32% in 2010. As the quality of the data about households in Switzerland could be improved since 1997, the non-systematic drop-outs (phone number not valid, language problems etc.) were reduced from 20% to 14%. At the same time the systematic drop-outs increased from 26% to 53%, mainly caused by rejection (increase from 17% to 44%). The latter development is unfortunately very common in Switzerland. It might be caused primarily

by overwhelming direct-marketing activities. The problem is even more serious if the increasing number of households without conventional phones (and with only cellular phones that are not registered and, thus, not possible to be included into the sample) were taken into account. At the same time, using the internet to interview people increases some dimensions of validity. It decreases the average age of the mostly over-aged samples. Thus, using the internet might produce more representative (undistorted) data in the future than using telephone or mail-out surveys only.

# Using automatic counters and GPS technology for recreation monitoring: case of Sonian Forest (Brussels, Belgium)

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## Introduction

Following a first estimation of the annual number of visits in the Walloon woodlands [COLSON V. 2009], the Brussels Institute of Environmental Management (BE-IBGE) wanted to have similar quantitative data for Sonian forest and understand its recreational use. Sonian forest is at the heart of a densely populated and urbanized area, and is crossed by several roads and railways. Since the forest has multiple entrances, it is difficult to get accurate information on the forest use. To answer this need, a pilot study was carried out by Ressources Naturelles Développement (a Belgian non-profit organization specialized in forest development) and Eco-Counter (world leader in pedestrian and bicycle counters), with the collaboration of Sonian forest agents and rangers. The objectives were to assess visitor behavior and estimate their number. This exploratory study, which was undertaken in a delimited area, aimed to develop and test a methodology which can be extended to the whole Sonian forest.

## Methods

18 automatic counters were installed at each entrance of the study area. The chosen equipment consisted of posts including a pyro-sensor and counting system. The Pyro sensor used passive infrared technology combined with a high-precision lens to detect changes in temperature when a person entered its range. The counter also detected people's direction of movement, so it was possible to differentiate people entering from those leaving the area.

The data was then automatically transmitted – via GSM connection – and integrated to the online data management platform *Eco-Visio*. Thus, data was deeply analyzed to observe how many visitors were counted for a specific entrance and specific period (hour / day / month), and to study temporal variations.

A field survey was carried out by BE-IBGE staff. Data was collected into two different sources: track logs through the distribution of GPS devices to visitors, and face to face questionnaires. The GPS devices stored geographical position information at regular time interval, from departure until return. This enabled to analyze visitor movements in the area as well as the duration of their activities. To understand the behavior better, the questionnaire gathered data on group size and composition, the origin of visitors, their age, activity and frequency of visit. The field work was carried out on different parking facilities located at the main entrances of the area. The gathering of data covered four days (from Thursday to Sunday) during three diffe-

rent periods: February, May, and October 2011. In total, 1,671 persons were interviewed and 603 GPS tracks were collected.

For data processing, each GPS track was linked to a questionnaire with a unique number. Relational database management and GIS were used for data storage and analyses. It was thus possible to segregate data in order to analyze visitors' behaviors according to defined criteria.

## Results

Thanks to data collected by the counters during one year, the annual number of visits for the 84 hectares area was estimated at 700,000. Moreover, the analysis highlighted temporal variations, among them:

- there were twice more visitors on Sundays than on weekdays;
- there was an increase in the number of visitors during spring and autumn, often mentioned in surveys carried out in peri-urban forests [COLSON V. 2009].

These temporal variations are particularly useful for forest managers as they provide them information on the periods when wildlife is mostly affected by recreation, which help them deploy staff appropriately.

Analysis of the GPS tracks on GIS provided a great understanding of how the forest is used by the visitors. GPS technology and GIS enabled to:

- Identify the duration of visit in the forest;
- Visualize the exact paths people use during their activity, and illustrate spatial distribution of visits;
- Determine where people stop and for how long.

The database containing the information from questionnaires was linked to the GPS tracks; therefore it was possible to deeply compare behaviors according to visitor features. The results showed that visitors use a more limited part of the area during the weekdays compared to the weekends, whereas the duration of visit is equivalent whatever the day of visit. The study also highlighted visitors use specific recreational areas according to their activity.

Visitor flows were mapped on GIS and overlaid with the protected area layer to analyze effects of visitor pressure on the ecology. Figure 1 shows that visitors are highly concentrated in the protected area, which is in fact a hilly area with ponds and thus landscapes of interest for visitors. This kind of cartography is a powerful tool for managers as it helps them undertake appropriate measures to reduce the impacts arising from recreational activities on protected areas.

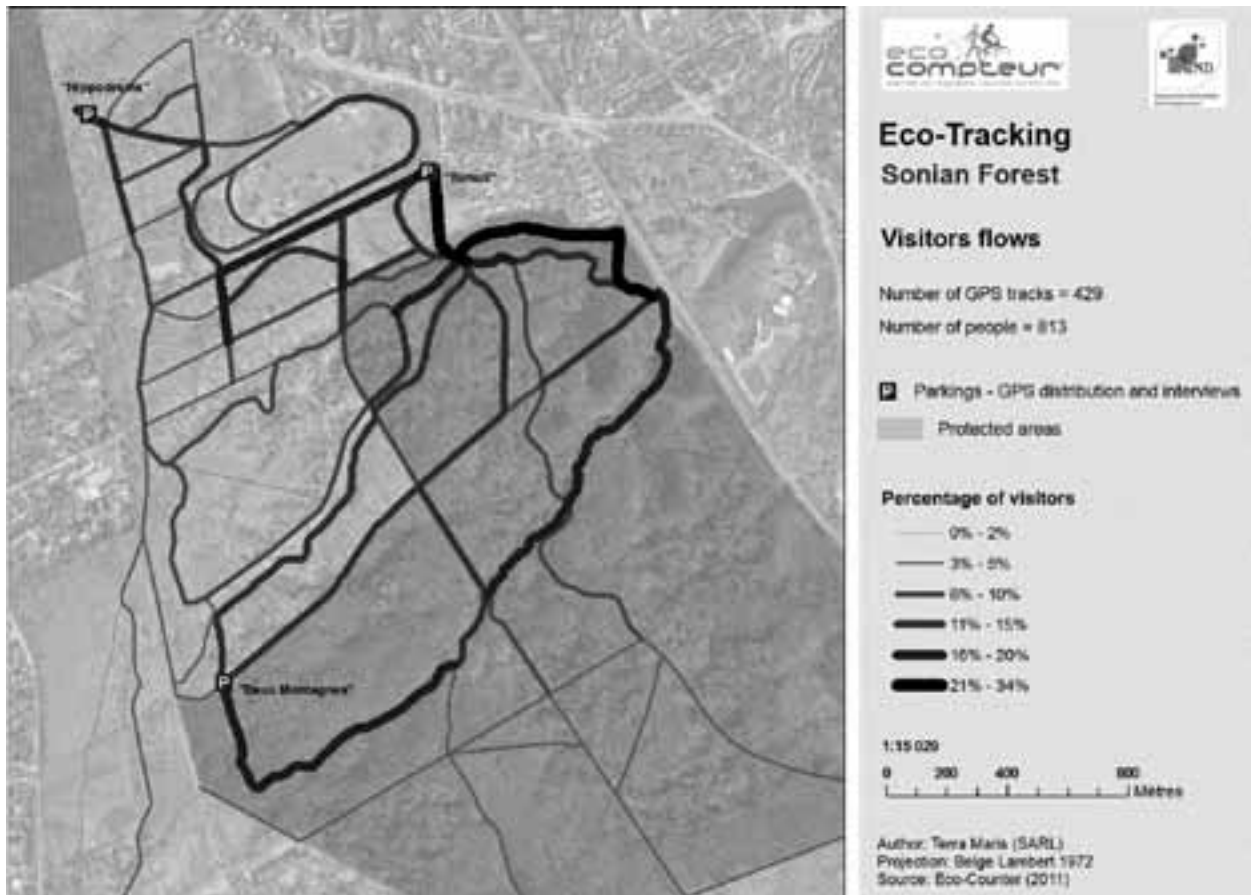


Figure 1. Impacts of visitor flows on protected areas

## Further research

A specific GIS application enabling advanced modeling behavior patterns of visitors in recreational areas is being developed. The first objective of this tool is to categorize every GPS tracks according to their percentage of similarity (used paths, covered distance) in order to understand which are the typical routes and the proportion of visitors covering these routes. The tool will also provide a more exhaustive estimation of the number of visitors on the area. Indeed, depending on the localization of the counters on the site, people can be counted by several counters. Overlaying the geographical position of counters with GPS tracks, the application will define an algorithm to link the counters. Thus, the GIS-based instrument will provide reliable tools for visitor management.

## Conclusion

The implementation of such a monitoring represents a successful long-term management tool which aims to evaluate the recreational zoning of the forest, and improve it if needed (Colson, Granet, Vanwijnsberghe, 2012). The estimation of number of visitors can help to receive public funding. Understanding the spatial distribution of recreation provides the basis to reduce the impacts arising from the increasing demands of recreation on protected areas. Eventually, it can aid decision makers to conceive appropriate policies combining visitors' recreational needs with nature conservation: redirect people away from the most sensitive sites, plan maintenance priorities, adapt infrastructure that will have minimal impact on the forest and deploy staff appropriately.

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# Socioecological tools for the planning of tourist destinations in Kainuu, Finland

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## Introduction

The increasing importance of the amenity benefits of forests, such as biodiversity and recreation, has challenged the land-use planning of tourism areas. Planning and coordination of different land-use forms, such as nature protection, recreation and forest management, need a multidisciplinary approach, which in turn requires new tools to collect and administer increasingly multi-faceted information. Management planning should be targeted simultaneously at ensuring biodiversity, providing nature resources in an economically sustainable way, and ensuring the social acceptability of management actions. Close cooperation between researchers, administrators, planners, and local people is crucial. Planners and managers need new means to use and benefit from existing ecological information and knowledge of people's values, in land-use planning. Thus, there is a need for new operation models and new tools for collecting experiential knowledge from different stakeholders and translating this information into practice.

The availability of ecological information has been considered important in land-use planning, although the insufficiency of the ecological data and problems in interpretation may hinder their use in the planning process (Yli-Pelkonen and Niemelä 2006). Often, there are not enough resources to conduct detailed nature inventories. Ecological information with geographic reference is nowadays commonly collected in many organizations. Thus, there are several ecological databases with geographic information. However, there are no methods how all these databases could be combined and effectively used in sustainable land-use planning. Considerable amount of information is also available on the social sustainability or tourism in rural areas (e.g. Törn et al. 2008). The questions; how to involve 'silent groups' more in planning and how to combine social information with other information in land-use planning, have been raised. The values and preferences of local residents or visitors to an area, if gathered through surveys or public hearings, are typically not referenced to a spatial location, and are therefore difficult to integrate with other types of data sources. Therefore, approaches to locate public-perceived values of forests and other nature areas spatially have been introduced both in rural and urban areas (e.g. Brown 2006, Tyrväinen et. al. 2007).

The project "Socioecological tools for the planning of tourist destinations in Kainuu, VAAKA", aims to develop a new GIS-based operations model for land-use planning. The goal is to increase the social acceptability, ecological sustainability and attractiveness of nature-based tourism. The project's pilot areas are tourism resorts, located close

to protected areas. The growing tourism industry requires a change in the current land-use plan. Therefore, the local authorities face the challenge of managing different land-uses, such as tourism, recreation, protection, forest management, and proposed mining, in the area.

## Methods

In this project, we combine existing ecological data with new socio-cultural data to get socioecological knowledge with geographic information from the study area (fig 1).

The project consists of three parts:

### 1. *Compiling spatial data from pilot areas.*

Existing spatial data on the ecology and urban structures of the pilot areas is collected. Ecological data is provided by local authorities. Data on bird species is also provided by external service.

### 2. *Collecting social and cultural knowledge from different stakeholders*

Social and cultural knowledge of different areas as well as values related to different land-uses is collected from different stakeholders. All data is collected through internet-based SoftGIS -application and surveys. Soft-GIS is participative geographical information generated through the interaction between environment, individual and community (Kahila & Kytä 2009). Soft-GIS has been developed for urban planning, and our project is the first one to apply the method to rural recreational areas and to combine collected data with ecological information.

The softGISapplication is introduced to stakeholders in a workshop and the contents and appearance of the application is further customized based on the comments received from stakeholders.

### 3. *Piloting the new operations model: coordinating the different land-uses*

Finally, data and information collected in parts 1 and 2 are combined and the distribution of ecological and sociological information in the map is examined. Through spatial data analysis we can pinpoint the ecologically and culturally valuable areas with possibly conflicting land-use pressures. As a result, a classification system that is based on ecological values of the area and the values of people is established. The new system can be used to rate different areas into different use classes based on their suitability. The second workshop is arranged to locate the ecologically and culturally valuable areas with possibly conflicting land-uses. The feedback

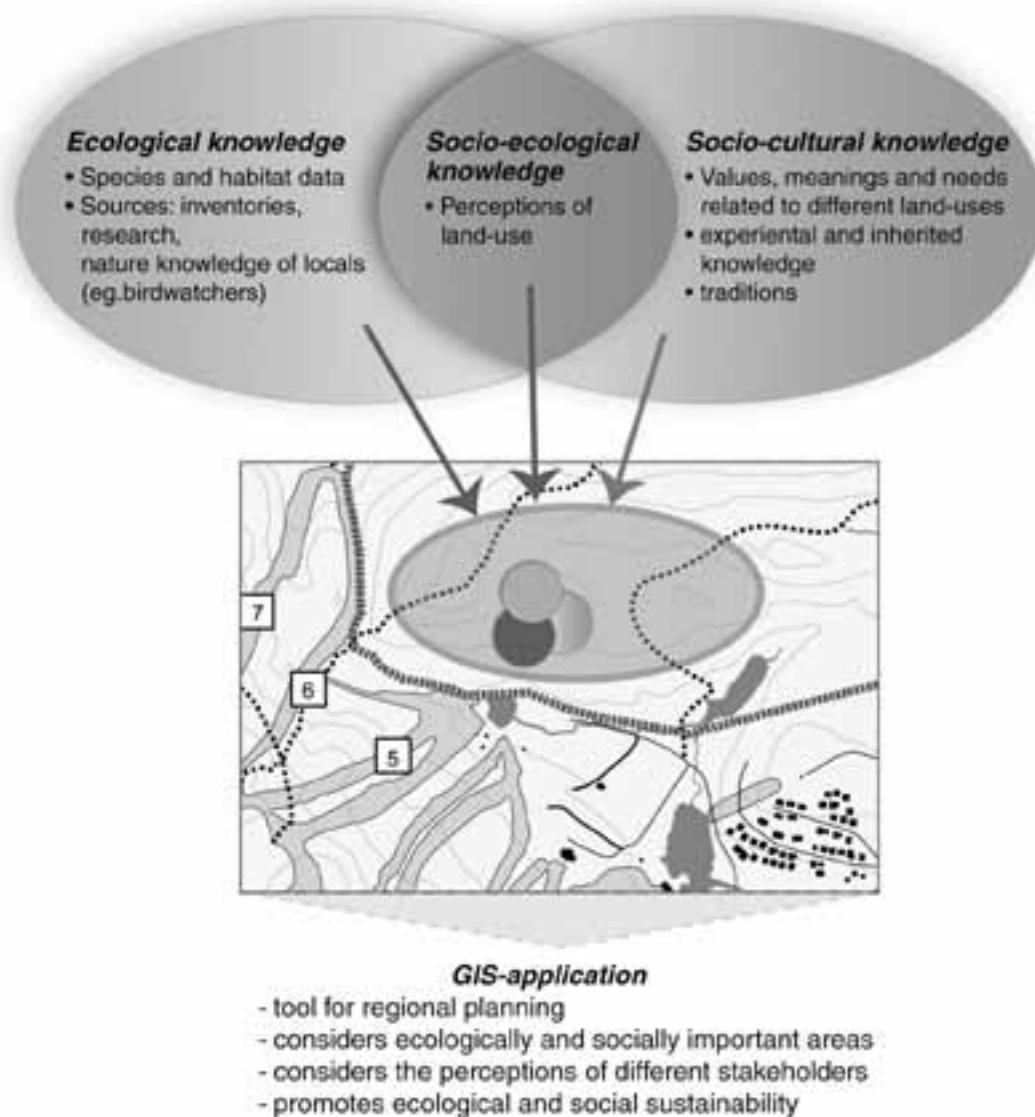


Figure 1. Combining the ecological and social knowledge to socio-ecological knowledge.

is used to improve the new pattern for land-use planning. The workshop results and future plans is presented in the closing seminar.

### Expected results

1. Socioecological knowledge with geographic information.
2. New operations model with a classification system, which increases the environmental knowledge of stakeholders and promotes networking among tourist entrepreneurs in the Kainuu area.

3. Utilisation plan for the new operations model.

### Project partners

The responsible organization is the Finnish Forest Research Institute. The project is conducted in cooperation with Metsähallitus and Aalto University. The project is mainly funded by European Regional Development Fund (ERDF) granted by the Centre for Economic Development, Transport and the Environment. Other partners include Kainuun Etu Oy, the Puolanka – Paljakka Travel Association, Ukkohalla Ltd, the Municipality of Puolanka.

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# Assessing hiking trails condition in Iceland using GIS – Implication for sustaining visitor use in vulnerable arctic environments

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## Introduction

During the past decades arctic regions have gradually been gaining increased interest by tourists and subsequently by tourist's operators. At the same time, many of the rural areas in the arctic have been facing considerable migration of local residents to more populated areas. Tourism is thus most often seen as a positive development in the arctic. The arctic regions are generally characterised by vast natural areas and mainly attract tourists who are interested in experiencing nature and nature based activities. Natural area tourism has over the past decades grown at an explosive rate worldwide and according to Newsome et al. (2002) has a capability to change both natural areas as well as tourism itself. This increased popularity in natural area tourism is thus likely to cause severe stress upon the most vulnerable ecosystems such as represent the many of the subarctic and arctic areas.

In Iceland tourism has grown rapidly over the past decades, from c. 4000 foreign visitors in 1950 up to 565.611 in 2011, with a mean annual increase of 7% over the last ten years (ITB, 2012). Half a million visitors may not seem extreme, but it has to be kept in mind that Icelanders numbered only 319.575 on the 1<sup>st</sup> of January 2012 (Statistic Iceland, 2012), and that most tourists visit the country during the three summer months. Hiking is one of the most popular tourist activities in Iceland, especially in the highlands. Thus, to be able to manage the environmental impact of nature tourism as well as to plan tourism in a sustainable manner a holistic overview of hiking trail condition in the most popular tourist destination of Iceland is fundamental as well as a better understanding of the relationship between the trails location and its physical properties. This study aims to evaluate environmental condition in relation to tourism in two popular tourists' destinations within the Icelandic southern highlands by: i) mapping and analysing the severity of current trampling impacts; ii) examining the relationship between trail condition and some vital physical factors related to the trails location; and by iii) assessing tourists' perception as regard the areas' environmental condition.

## Data and methods

To obtain a holistic overview of the condition of the current hiking trails in the various tourists' sites in Iceland, a compatible condition measurement scale is critical. Such a scale allows for the availability to assess much larger areas in less time and lower costs than other methods of hiking trail assessment. Therefore, as a first step to assess trail conditions in relation to tourism in Iceland, a condition scale for hiking trail assessment was designed (Table 1). The scale used in this study is developed from condition class descriptions

presented by Marion et al (2006) and adjusted to Icelandic conditions from field findings related to this study and earlier ones (i.e. Ólafsdóttir, 2007). To minimize subjectivity a minimum of two observers were used to assess and interpret each hiking trail. To prevent complexity in interpretation of the class assessment definitions, a classification system was further developed and each assessment factor given special scores ranging from 0 to 3 according to its condition. To analyse the severity of current trampling impacts within the two selected study areas, field inventories were carried out in Þórsmörk and in Fjallabak Nature Reserve. The hiking trail selection criterion is based on trails that are marked in field and presented on hiking maps published for tourists. Hence, each trail was hiked by two to three observers simultaneously and sample points taken every 100 m. At each point measurements of the trail's width and depth was taken as well as visual assessment of the trampling impact on the ecosystem and severity of erosion. A total of 890 sample points were collected and classified within the two study areas. A geographical information system (GIS) was used to examine the spatial interrelation between the measured trail condition in field and physical factors related to the trails location, i.e. ecological sensitivity; vegetation cover, altitude and slope angle. A tourism survey was furthermore carried out to compare tourism experience with the measured reality.

## Results

The results reveal that less than half, or 41%, of the hiking trails assessed within the Þórsmörk area are classified as being in good and very good condition according to the condition measurement scale. A total of 29% are in acceptable condition. Trails classified as bad and very bad condition are 19% and 12% respectively. The majority (61%) of the hiking trails assessed within Fjallabak Nature Reserve are on the other hand in good and very good condition. A total of 27% are in acceptable condition, and 11% are classified as bad condition. Less than 1% is in very bad condition. Hence, the trails' physical condition is noticeable much worse in the Þórsmörk area than in Fjallabak Nature Reserve. Majority of the hiking trails in Þórsmörk are located within vegetative areas, mainly by the sensitive heath moss cover, while majority of the assessed trails in Fjallabak are located within areas that are unvegetated. That is likely to explain part of the difference between the study sites. However, no significant correlation is found between the physical properties tested and the trail condition. Despite serious soil erosion as a result from tourists hiking in many of the trails, most tourists consider the hiking trails in general in a good condition.

Table 1. Condition scale for hiking trails

<i>Scale</i>	<i>Condition</i>	<i>Score according to classification</i>	<i>Definitions</i>
<b>0</b>	Very good	0-1	No stress. Trail is hardly seen. Little or no disruption to the vegetation cover and/or the parent material. No erosion
<b>1</b>	Good	2-4	Little stress. Trail noticeable. Disruption of vegetation cover and/or the parent material significant. No erosion
<b>2</b>	Acceptable	5-7	Some stress. Trail obvious. Disruption of vegetation cover and/or the parent material considerable. Significant erosion.
<b>3</b>	Bad	8-10	Much stress. Vegetation heavily degraded or dead. Parent material eroded. Active erosion.
<b>4</b>	Very bad	11-12	Very heavy stress. Vegetation dead and soil erosion striking. Active gully erosion from trail.

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# Combining Stated Preference techniques and GPS tracking to model the effect of access policies in the Dolomites, Italy

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## Introduction

The visitation of protected areas generally involves two main travel components: a trip to the point where the actual excursion starts (e.g. parking, trailhead, etc.) and the excursion itself. The implementation of different access policies (e.g. toll road, restricted access on paths) on one of these two components may affect the other and vice versa. Understanding these reciprocal effects before the actual implementation of a policy would help park managers define strategies that better preserve the environment while ensuring higher standards of recreational quality. Stated Preference (SP) techniques have been widely used to estimate the sensitivity of visitors to different management options in protected areas (Lawson and Manning, 2002; Kelly et al., 2007) and assess the likely acceptance of various transportation alternatives (Pettebone et al., 2011). GPS devices have been applied recently to track people's movements and eventually identify areas that may experience problems of overcrowding (Hallo et al., 2005; D'Antonio, 2010). This study introduces an innovative methodology that combines stated preference techniques and GPS-based tracking to estimate the likely effects of an access policy in natural and protected areas. The methodology was tested in an area of the recently established Dolomites Unesco Heritage site (Italy). This is one of the most popular excursion areas of the Dolomites and can be reached quite easily via road and cable cars.

## Method

The proposed approach relies on three main actions: visitor counting, preference elicitation and GPS tracking. Counting of both vehicles reaching the area and individual hikers is performed at the main entrance points of the excursion area by means of mechanical and manual counters. The preference of visitors with respect to different access policy options is elicited through an SP questionnaire. The questionnaire includes a preliminary section where the respondent is asked to provide some basic information (e.g. age, origin, expected destination of the day) and the actual stated preference section. The latter proposes a number of choice sets from which to pick one of three labeled alternatives reflecting possible ways of reaching the area (i.e. car, bus, cable car). Each alternative is described by five attributes referring to both the alternative's characteristics and environmental conditions at the destination: cost, convenience (e.g. availability of parking lots), accessibility constraints (e.g. hours of service), traffic, crowding on the path. After completing the questionnaire, the respondent is given a GPS logger that will be returned at the end of the excursion. The logger is a cheap device that records the

geographic coordinate of the user at fixed intervals of time and has a capacity of several thousands records. As the reference number of the GPS device provided to a respondent is written on the questionnaire, information supplied by these two tools can be linked. Given the characteristics of the study area, the various actions were performed at different locations, as depicted in Figure 1.

## Results and discussion

Our approach enabled the collection of a vast amount of inter-connected data regarding people's movements and preferences in a protected area. Counters let the correlation between the number of cars reaching the area and the number of people starting an excursion to emerge. The SP survey informed about the likely response of visitors to access policies that modify the cost and degree of freedom associated with different transportation options. Moreover, it highlighted visitors' willingness to tradeoff the convenience of a transportation option against the environmental quality of the site. Finally, GPS devices provided a very detailed description of each respondent's itinerary (e.g. length, average speed, stops) and, when joined with responses to the questionnaire, a thorough understanding of a visitor's current and expected behavior. The main advantage of the proposed approach is the cost-benefit ratio. When considering that mechanical counters require limited human assistance and that many visitors can be contacted by simply choosing the right locations across the study area, few people can collect large amounts of data in just few days of work. The ability to link preferences as elicited through questionnaires and GPS tracks provides valuable insights into the relationship between modes of access and chosen itineraries, thus offering a thorough understanding on the potential global effects of a given management policy. This is exactly the kind of information that can adequately feed agent-based simulation models used to describe in detail such effects and therefore the method seems promising in the field of protected area management. These elements are presented and discussed in the light of the preliminary results obtained during the first summer campaign.

## Acknowledgements

This study is part of the AcceDo research project, which obtained financial support from the Provincia Autonoma di Trento (Italy) through a Marie Curie action, 7<sup>th</sup> Framework Programme, COFUND-GA2008-226070, "Trentino" Project.



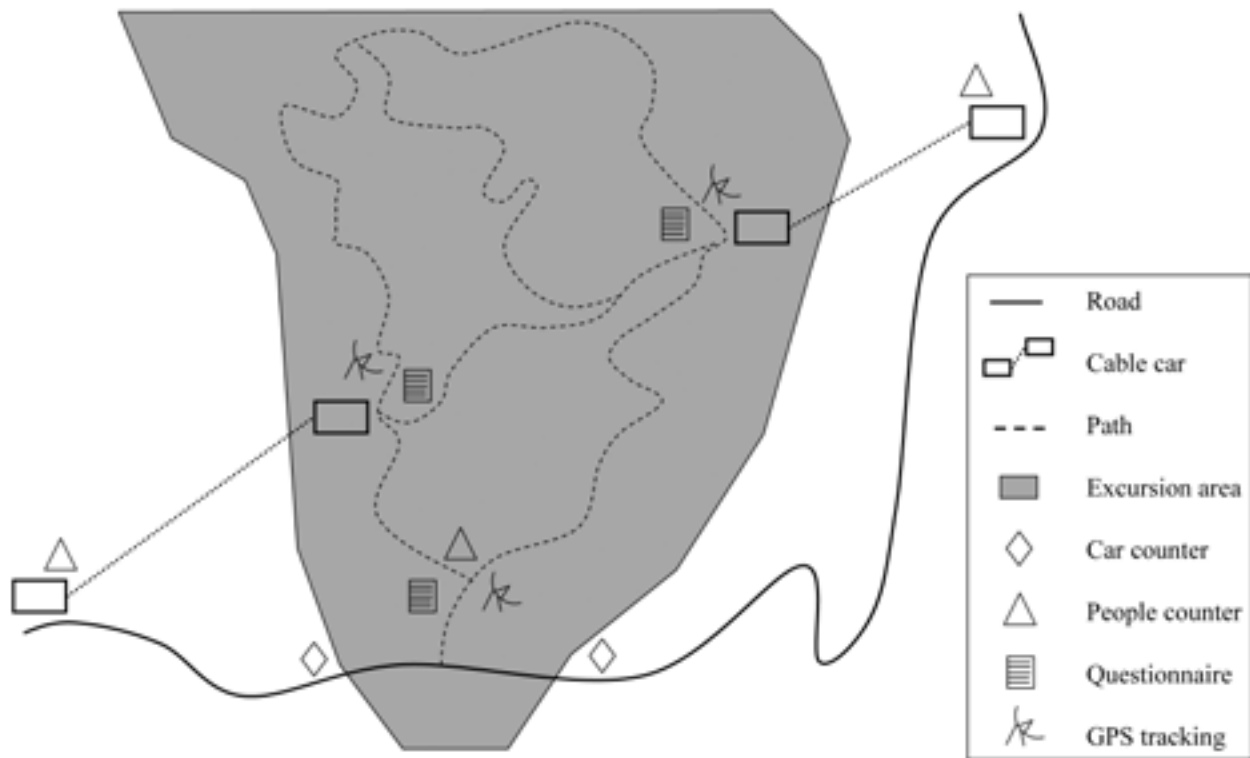


Figure 1. The proposed method involves different actions (visitor counting, preference elicitation through questionnaires, GPS tracking) being performed at different locations across the study area.

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# The Use of GIS in Sustainable Tourism Planning – a case study from Katla Geopark, Iceland

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## Introduction

Worldwide tourism planners and policy makers are becoming more inclined to recognize and promote the importance of local knowledge, especially its relevance to issues of sustainable management. The importance of integrating local knowledge into regional tourism planning is recognised as critical for sustainable tourism management. Local knowledge reflects the diverse range of opinions of particular places in the community as well as different values, emotions and perceptions of a place that are of vital importance for sustainability of a place, both for the local community and tourism development. Sustainable management is furthermore only achievable if all stakeholders and interest groups are involved in the planning process. Therefore integrating their perception into the planning process is of vital importance. To be able to promote sustainable tourism it is likewise important to map the locals' knowledge and understanding the concept of sustainability. This study aims to assess the potential of integrating local perception into sustainable tourism planning. This integration is to be achieved through the uses of Geographic Information Systems (GIS) through a participatory mapping exercise. The specific aims are to: i) assess local perception and understanding of the concept of sustainable tourism; ii) examine a participatory mapping exercise to achieve local knowledge as regard perception of tourism development and future tourism planning within Katla Geopark; and to iii) identify potential sites that could be attractive for tourism development within Katla geopark as regard the local tourism operators' perception.

## Methodology

Katla Geopark is Iceland's first and so far the only geopark. It was accepted to the European Geoparks Network and jointly to the Global Geoparks Network in September 2011. It covers 9542 km<sup>2</sup>, or about 9,3 % of the total area of Iceland, and is made up of three municipalities with total population around 2700 (Figure 1). To assess the locals' understanding of the concept of sustainable tourism an internet based survey was sent out to all tourism operators within Katla Geopark. The survey was pre-tested by five operators and adjusted to their comments. As a first step to achieve local knowledge as regard perception of tourism development and future tourism planning within Katla Geopark interview were taken to local tourist operators. Ten operators were selected from each of the three municipalities, or a total of thirty interviewers that are 37% of all tourist operators in Katla Geopark. The interviews were taken in all cases at the operator's home in May and June 2012. The first part of the interview focuses on the locals' operators' perception

as regard the economic, social and environmental impact of tourism, threats of tourism and expectation to tourism development in the geopark. In the second part of the interview the interviewers were asked to draw up on enlarged satellite image of Katla geopark areas that they consider the most important for the geopark, areas that they would like to see increased tourism service and infrastructure and areas that they consider need to be protected or to have limited tourism access. They were further asked to write down three issues that they like best about the geopark, three issues that they don't like and three issues that they would like to see become a reality in the future due to the advent of Katla geopark. Geographical information systems will be used to spatially analyze the collected data and identify potential sites for future tourism sustainable development.

## Initial results

This project is being carried out in summer 2012 and first results will be introduced at the conference. Initial results as regard the locals' operators understanding of the concept of sustainable tourism reveal that only 14% find the concept familiar and believe they understand the concept. Nearly 65% are somewhat familiar and 21% do not understand the concept. Majority (60%) believe that natural resource protection and tourism can be compatible. Nearly 60% do not notice any demand for sustainable tourism in and around Katla geopark, but halve of them believe that a demand for sustainable tourism could be developed in the geopark.



Figure 1. Location of Katla Geopark ([www.katlageopark.is](http://www.katlageopark.is))



## ORGANIZED SESSION: ROUND TABLE

# Addressing challenges in managing recreation in protected areas: A cross-cultural approach

Session organiser: **Eick von Ruschkowski**, Leibniz Universität Hannover, Germany, ruschkowski@umwelt.uni-hannover.de (contact person); **Arne Arnberger**, Universität für Bodenkultur, Austria, arne.arnberger@boku.ac.at; **Robert C. Burns**, West Virginia University, USA, robert.burns@mail.wvu.edu

The value of “internationalizing” park and protected area management has drawn much discussion over the past decade. Growing challenges like climate change, ecosystem services, biodiversity, landscape fragmentation, renewable energy, demographic change continue to pose new challenges to managers. With many different issues and approaches at stake, mutual learning processes that value the diversity of cultures, seem to be beneficial to academics and practitioners in order to develop alternative solutions. This becomes especially important when looking at adaptive management and collaborative planning strategies.

This round table is aimed at discussing these issues with a special focus on cross-cultural differences in visitor patterns and behavior as well as visitor management approaches. Panelists will give brief introductory statements to identify current challenges, but also to illustrate current good practice examples or to report from their own individual research background and settings. This will be used as the baseline to engage in a moderated discussion with the audience. The panelists have been selected from a diverse cultural background (North America, Europe and Asia).

The discussion will focus on the idea of developing alternative solutions vs. using well-trodden paths in the field of park and protected area management, the opportunities and challenges of such approaches and the framework conditions that are required to develop innovative approaches. Another critical need is to understand how international /cross-cultural collaboration is built, with regards to both obtaining funding and understanding effective methods of engaging researchers from other cultures. The presenters will discuss their perceptions of best practices regarding obtaining and sustaining international research efforts. This proposed panel session is aimed at both practitioners and the research community. Participants are encouraged to share their experiences with cross-cultural research or international collaborative efforts.



ORGANIZED SESSION: ORAL

## Current research on informal trails: Effects on ecology and landscape fragmentation

Session Organizers: **Yu-Fai Leung**, North Carolina State University, USA, [leung@ncsu.edu](mailto:leung@ncsu.edu);  
**Catherine Pickering**, Griffith University, Australia, [c.pickering@griffith.edu.au](mailto:c.pickering@griffith.edu.au)

At the previous MMV meetings, the Recreation Ecology Research Network (RERN) organized special sessions to facilitate international dialogue about issues, challenges and directions of recreation ecology research. Recent research, influenced in part by these discussions, has begun to address the important issues in the field, including identifying “cutting-edge” research themes and cross-continental comparisons of visitor impacts. At MMV6, the RERN intends to continue this tradition by focusing on an emerging research theme – effects of informal trails on ecology and landscape fragmentation. Trails are important recreation infrastructure in protected areas, but their presence and use can affect the ecology of adjacent corridors. Trail network also fragment highly-valued protected areas already confined by roads and other human development. Unplanned visitor-created informal trails further exacerbate these ecological and fragmentation effects by expanding influence into sensitive habitats. This problem presents an important threat to biodiversity and landscape conservation objectives. Trail impacts have attracted considerable research attention in the past few decades, but only until recently have there been a focused research attention on informal trails and their ecological consequences.

Presenters in this session will report the current state of research on ecological and fragmentation effects of informal trails from North America and Australia. These studies investigate the ecological and fragmentation effects of informal trails with respect to measurement, monitoring and management effectiveness.

# Informal trails and fragmentation effects: A conceptual and research overview

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**Catherine Pickering**, Griffith University, Australia; **David N. Cole**, Aldo Leopold Wilderness Research Institute, USA

## Introduction

Trails are important recreation infrastructure in protected areas, but their presence and use can affect the ecology of adjacent corridors. Trail networks fragment highly-valued protected areas already confined by roads and other human development. Unplanned visitor-created informal trails, which commonly exist in many protected areas, further exacerbate ecological and fragmentation effects by expanding the influence into relatively undisturbed habitats. This problem presents an important threat to biodiversity and landscape conservation objectives. Trail impacts have attracted considerable research attention in the past few decades, but only until recently have there been focused research efforts on informal trails and their ecological consequences (Leung et al., 2011; Wimpey & Marion, 2011). This presentation provides an overview of visitor-created informal trails and past research that has examined their effects on landscape and habitat fragmentation.

## Characterizing informal trails

Informal trails, sometimes referred to as social trails, can be characterized in different ways, including spatial scale, distribution patterns, motivation of trail users, and types and significance of environmental impacts. Leung and Cole (in prep.) present a typology of informal trail networks based on the distribution pattern and spatial extent of informal trails. Informal trails may exist as individual trail segments or they may intertwine to form dense trail webs. These basic types of informal trails may occupy very limited spatial extent around a specific recreation site, or they can be spatially extensive in a landscape. Such differences in informal trail presence have implications for their fragmentation effects as well as for monitoring and management strategies.

## Informal trails and fragmentation

Focused research on the fragmentation effects of informal trails emerged only recently, although past recreation ecology research on human trampling provides ample empirical evidence of trail-related ecological changes at a local scale. At the local or trail corridor scale, research has examined immediate effects on the *trail surface* from trampling pressure and biophysical changes (Wimpey & Marion, 2011). These can contribute to *edge* effects on soil biota, flora and fauna next to trails, which can vary in intensity and extents (Pickering & Growcock, 2009). Research has also examined *conduit* effects of trails as they provide channels for dispersing invasive species and disease (Pickering & Mount, 2010). Informal trails can also create *barriers* for certain species, reducing the effectiveness of seed dispersal and the movement of ground dwelling insects and arboreal mammals (Holmquist, 2004). Surface, edge, conduit and barrier effects all contribute to fragmentation of habitats as a result of informal trail networks, reducing the area's conservation values and ecosystem services.

## Implications and conclusions

Further research is much needed on this topic. Informal trails need to be better measured and their effects better examined so that the ecological significance of their fragmentation effects can be evaluated. What is clear is that land managers need to minimize the formation of new informal trail networks and manage existing trail networks to reduce the impacts of fragmentation.

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# Informal trails fragment the landscape in a high conservation area in the Andes

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Catherine Marina Pickering, Griffith University, Australia

## Introduction

Areas of high use with free access often end up dissected by networks of trails. As a result, large areas of intact communities can be converted into numerous smaller subpatches (Leung et al., 2011). This type of internal fragmentation has a range of detrimental effects, including those directly due to damage from the trails, but also due to the edge effects of trails. In addition trails can restrict movement among subpatches for species with short dispersal distances, while enhancing the movement of other species along the trails. As a result the total area of intact vegetation is reduced along the trails, and on the verges, but also within subpatches. Changes in vegetation can include reductions in the cover, height, biomass of native plants, changes in species composition, and the introduction and spread of weeds (Monz et al. 2010; Wimpey and Marion, 2011). This multitude of impacts associated with fragmentation due to trail networks is of particular concern in high altitude parks that support rare and fragile ecosystems characterized by slow rates of recovery from disturbance (Körner, 2003). We assessed how trail networks have fragmented two high conservation value plant communities close to the entrance to the highest altitude protected area in the Southern Hemisphere, Aconcagua Provincial Park.

## Study area

Aconcagua protects 70,000 ha of glaciers, watersheds and alpine ecosystems in the dry Andes in Argentina (DRNR, 2009). It is a popular mountaineering destination as it contains the highest summit outside the Himalayas, Mt. Aconcagua (6962 m a.s.l.) (Barros, 2004). Each summer around 30,000 visitors, including >4,000 hikers along with 3,000 mules and horses traverse the intensive use area at the start of the Horcones Valley (2700–3000 a.s.l.), which is the main access route for the Park. As a result a network of formal and informal trails has fragmented this area, including alpine steppe vegetation and alpine meadows. These two communities are of high conservation value, contain most of the biodiversity in the Park and are the main habitat for over 44 native ground nesting birds (DRNR, 2009).

## Methods

The effects of fragmentation from a network of formal, informal trails roads and infrastructure were assessed in the Horcones Valley intensive use area. First, the 223 ha area intensively used by tourists between the highway, river and cliffs on the sides of the valley was mapped using a hand held GPS. Then spatial and attribute data were collected for all trails, roads and infrastructure within this area. The area occupied by roads and all formal and informal trails was calculated by recording their length and average width

measured every 100 meters. Also the natural boundaries of all meadow and alpine steppe vegetation were mapped. The data was converted to ESRI ArcMap 9.3 shapefiles for edition and analysis. To analyse landscape fragmentation, a similar methodology to that of Leung et al. (2011) was used. The high use area was used as a base layer from which all trails, roads and infrastructure were removed. This was accomplished by intersecting these features with the high use area to create shape files representing all the fragmented areas. These shape files were used to calculate the total area affected by visitors, and the number and size of subpatches per vegetation type. In addition, vegetation condition and level of disturbance were assessed in 102 plots (20 m<sup>2</sup>) which were randomly located in the area using the Hawth's Analysis Tools extension for ArcGIS. Vegetation parameters recorded in plots included the cover of native plants and weeds, species richness and plant composition. The presence of horse/mule dung, grazing damage, soil movement, and trampling damage was estimated in each plot using a four point scale ranging from zero (none) to 3 (extensive). A single measure of disturbance per plot was then calculated by averaging the four variables. The distance to the nearest trail and/or infrastructure from a plot was measured. All data were entered into SPSS (version 20) and descriptive analyses performed.

## Results

The 223 ha intensive use area is extensively fragmented by trails, with 25 trails, 8 roads, and 6 sites with infrastructure recorded (Fig. 1). The combined length of the 2 formal trails was 2 km, and they were 3 m wide. The combined length of the 23 informal trails was >12 km with an average width of >2 m. This resulted in 16 ha directly affected by visitor use, fragmenting 9 ha of alpine meadows and 198 ha of steppe vegetation. Two patches of alpine meadow were fragmented into 10 subpatches, 6 of which were less >0.06 ha. Steppe vegetation was fragmented into 52 patches averaging 3.7 ha (Fig. 1). For the 102 plots surveyed, 11 were in alpine meadow and 91 in steppe vegetation. Over half of the plots had medium to high levels of disturbance. Vegetation cover was 40% in alpine steppe and 77% in alpine meadows, resulting in a 30% reduction in cover for alpine steppe and 10% reduction in alpine meadows compared to undisturbed sites (Barros, 2004). All plots in meadows had weeds as did 58 plots in steppe vegetation. The proportion of weeds (36%) and weeds species richness (5) was higher for plots closer to trails (Fig. 1). In alpine steppe vegetation, the exotic herb *Convolvulus arvensis* had the highest cover (22%) while in the alpine meadows the dominant weed was the herb *Taraxacum officinale* (16%).

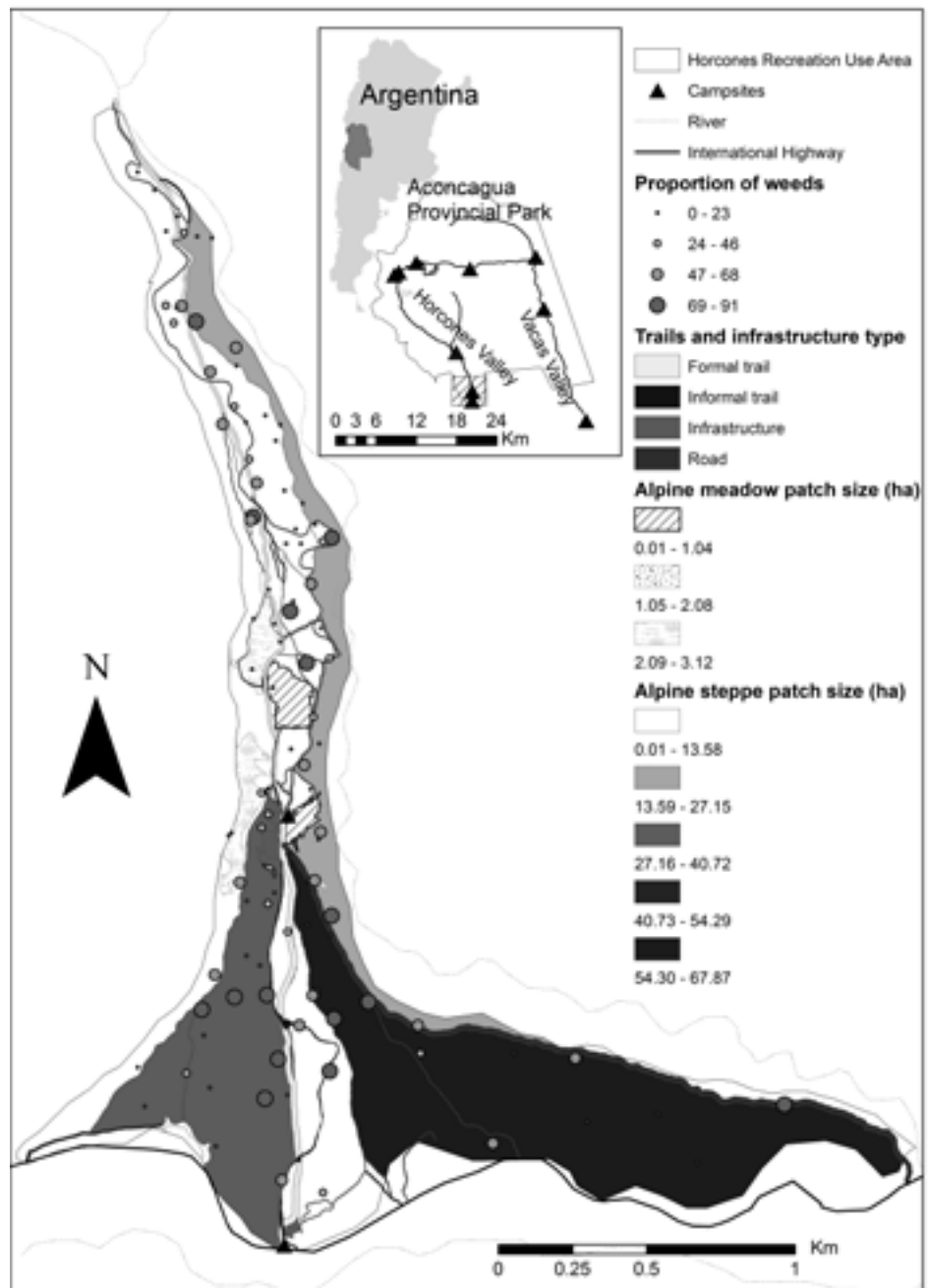


Figure 1. Type of trails and infrastructure, patch size per vegetation type and proportion of weeds in the high use area of the Horcones Valley (69° 56' West, 32° 48' South) in Aconcagua Provincial Park, Mendoza, Argentina.

## Implications

Tourism use including the >12 km network of informal trail has extensively damaged alpine meadows and steppe vegetation at the entrance to the Horcones Valley. As a result 7% of the area is occupied by trails and infrastructure, while vegetation away from trails had lower native cover

and higher weed diversity and cover than undisturbed sites. In this, and other high conservation areas, where such informal trail networks form effective management is required to concentrate use on a limited set of trails, and remediate areas already damaged including controlling the proliferation of weeds.

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# Informal trails fragmenting endangered remnant vegetation in Australia

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Natural areas attract a range of recreational users across a broad spectrum of land uses including rural and urban settings. Recreational impacts are often controlled by restricting access through the use of zonation schemes, designated access routes, and hardened sites (Newsome et al. 2002). Despite this, these areas continue to be impacted by informal trails. Informal trails created by hikers and other visitors within natural environments can degrade high conservation value rare plant communities (Newsome and Davies, 2009; Pickering et al. 2010). Direct impacts of trails include reduced vegetation cover, compacted soils and soil erosion. There are also numerous edge effects including increased light, the spread of feral animals and weeds and reduced habitat quality for native animals (Liddle, 1997). As a result, networks of informal trails can internally fragment vegetation into smaller and smaller functional patches each exposed to proportionally greater edge effects. We assessed how these trail networks have degraded remnants of an endangered urban forest community within the seventh largest city in Australia, the Gold Coast in Queensland.

Tall open Blackbutt forest is an endangered regional ecosystem with high conservation value that is dominated by the large evergreen hardwood *Eucalyptus pilularis* (EPA 2007). It provide habitat for native animals including threatened species such as the green-thighed frog (*Litoria brevipalmata*), wallum froglet (*Crinia tinnula*), and koala (*Phascolarctos cinereus*), as well as regionally significant populations of the native yellow-footed antechinus (*Antechinus flavipes*), squirrel glider (*Petaurus norfolcensis*) and swamp rat (*Rattus lutreolus*). Within Queensland, the majority of remaining Blackbutt forest occur within the rapidly developing urban area of the Gold Coast. Although it once covered 7757 ha (5.6%) on the Gold Coast, by 2003 there was only 767 ha left (0.6%) due to ongoing clearing, mostly for urban development and agricultural use (EPA 2007). In addition to the direct threat arising from loss through urban development many remnants are easily accessible by locals and are extensively used for a range of recreational activities resulting in the formation of extensive trail networks (Pickering et al. 2010).

We assessed the effects of trail networks on eight Blackbutt remnants on the Gold Coast with a total area of 37 ha. The ArcPad (ESRI, ver 7.0) interface on a Trimble Juno ST handheld GPS unit was used to survey the perimeter of each remnant and all trails within it. Trails were broadly categorized as narrow, single person, two person, three person, or proper roads based on the width and nature of the trail. At 91 evenly spaced points along the trails, transects set at right angles to the trail were used to measure trail width, width to nearest vegetation (ground cover), width to shrub layer and width to tree trunks. Following field data capture, all trail attributes (i.e. width and distance measures) were

linked using the spatial join function in ArcMap. The areas of bare soil, and areas without ground cover, shrubs or trees were calculated by buffering all linear trail features by the mean width of each disturbance type for each trail type. Overlapping buffer areas were dissolved to determine the overall impact area. These data were then used to calculate the reduction in the area of each fragment, the number of subpatches created and the average size of subpatches created due to trails. Similar analyses were then completed to determine the areal reductions within subpatches associated with increasing levels of impact resulting from the loss of ground cover, shrubs and trees on the trail verges.

The eight remnants surveyed averaged 4.6 ha, with the smallest 0.72 ha and the largest 12 ha (Table 1). There were just over 9 km of trails within these remnants, 1.7 km of which was formal tracks and 7.4 km of which was informal trails. These trails resulted in the loss of 2.8 ha of forest overall, and the fragmentation of the 8 remnants into 101 subpatches with an average size of 0.39 ha, the largest of which was only 3.8 ha. When the loss of ground cover associated with the trails and their verges was calculated, a total of 3.8 ha of forest no longer had ground cover, and the average size of subpatches was further reduced to 0.36 ha. When the reduction in shrub cover was assessed, the estimated extent of trail impacts increased to 5 ha, and the average subpatch size was only 0.34 ha. When the area where there were no tree trunks was calculated, the extent of trail impacts increased even further to 6.4 ha. At this resolution the extent of remnant fragmentation is most severe with 109 subpatches averaging 3.5 ha, being recorded. Of these only 15 were >0.5 ha in size. While the full extent of edge effects in urban remnants is yet to be determined, if we assume that trail effects could potentially penetrate up to 5 m from the edge of trails then the cumulative loss in remnant area would be 9 ha. This amounts to the potential functional loss of almost 25% of this endangered community.

These results highlight how recreational trail networks can degrade forest remnants from the interior, particularly when they occur as remnants surrounded by urban development. This degradation is important as there was not only a loss of 17% of the forest directly, and potentially 25% indirectly, but also the proliferation of very small patches within the remnants. Therefore the capacity for these remnants to persist as functional ecosystems is likely to be compromised with only those subpatches that exceed minimum area thresholds being able to maintain recruitment, harbor faunal species and support habitat values. The determination of such threshold values, however, requires further analysis of the life history traits of both the flora and fauna in these habitat remnants. Furthermore, these trail networks also facilitate the influx of additional threat agents, including weeds, feral animals and fires, further exacerbating the po-

Table 1. Effects of fragmentation by formal and informal trails on eight remnants of the endangered Blackbutt forest, Queensland, Australia. Reduction in area and effect on subpatch size and number are assessed based on just the trails surface, and on its effect on ground cover, shrubs and trees as well as the area left unaffected by a 5 m buffer on each side of the trails.

Remnants	Original	Trails	Ground cover	Shrubs	Trees	5m buffer
<b>Area remaining (ha)</b>						
1	3.9	3.8	3.7	3.7	3.6	3.5
2	3.5	3.3	3.2	3.2	3.1	2.8
3	3.6	3.4	3.4	3.3	3.3	3.1
4	4.9	4.7	4.6	4.5	4.3	4.0
5	0.7	0.6	0.5	0.5	0.4	0.3
6	3.3	2.9	2.8	2.7	2.4	2.0
7	5.0	4.3	3.9	3.6	3.4	2.9
8	12.0	11.2	11.0	10.5	10.1	9.3
Total	37.0	34.2	33.2	32.0	30.6	28.0
<b>Number of subpatches</b>						
1		6	8	7	4	2
2		14	12	12	10	7
3		5	5	6	8	4
4		8	8	9	9	5
5		10	8	8	8	0
6		17	17	16	23	19
7		19	20	21	22	19
8		22	22	21	25	23
Total		101	100	100	109	79
<b>Mean area of subpatches</b>						
1		0.63	0.47	0.53	0.91	1.75
2		0.23	0.27	0.26	0.31	0.40
3		0.68	0.67	0.55	0.41	0.78
4		0.59	0.57	0.50	0.48	0.80
5		0.06	0.07	0.07	0.05	0.03
6		0.17	0.17	0.17	0.11	0.11
7		0.22	0.19	0.17	0.15	0.16
8		0.51	0.50	0.50	0.40	0.40
Average		0.39	0.36	0.34	0.35	0.55

tential for degradation. What this study has clear demonstrated is that fragmentation associated with networks of informal trails for recreational use are an important threat to remnant vegetation.

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# Impacts of trail networks on rare and threatened plant communities in Australia

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Nature-based tourism and outdoor recreation are increasing worldwide as is the environmental damage associated with these types of use. Trails are one of the most common types of infrastructure provided for tourists by park agencies or created by tourists as they access destinations. These formal and informal visitor trail networks have a range of negative impacts on flora, fauna and ecosystem functioning (Monz et al., 2010a). Where such trails traverse plant communities that are already rare and threatened such impacts are of even greater concern.

Although by definition rare and threatened plant communities have limited distributions, perversely, they can also be particularly attractive tourism and recreational destinations. Firstly, topography contributes to the rarity of some plant communities such as those on mountain summits and headlands or in dune systems, coastal heaths and riparian zones. These topographic attributes also make such sites attractive destinations for enjoying views, rock-climbing, hiking, biking, horse-riding and boating (Monz et al., 2010b). They often become 'honey pot' sites subject to crowding, unregulated use and the creation of informal trails (Wimpey and Marion, 2011). Secondly, urbanization, like topography, may contribute to rarity and high visitation rates. In urban areas there are plant communities that are threatened due to clearing for housing and other urban infrastructure. These remnant communities can receive high visitation both as 'green spaces' for recreational purposes and because they are easy to access by a diverse range of users (Pickering et al., 2010). This means that these communities, already curtailed by external fragmentation, may continue to decline in ecological quality through internal fragmentation resulting from the proliferation and use of formal and informal trails (Newsome and Davies, 2009). Thirdly, in some cases, threatened plant communities can be inherently attractive to tourists, in part due to their rarity, but also due to other qualities such as unusual growth forms (Succulent Karoo, South Africa), mass flowering (Ephemeral herb-rich grasslands, Australia) and age (Ancient Oak woodland, UK). Such qualities can also lead to large visitor loads and the generation of informal trails by users in order to get closer to the unusual plants in these communities, which in turn further degrade their quality and extent.

The damage caused by trail networks to rare and threatened plant communities varies with timing of use (social, seasonal and biological), user behavior, activity type and intensity and the resistance/resilience of the ecosystem. Impacts include the direct effects of trail construction, maintenance and use as well as indirect or spatial effects resulting from the internal fragmentation caused by these trails. Firstly, the formation and use of trails for a wide range of activities directly damages vegetation and these

on-trail impacts have been widely studied. Impacts may include reduced vegetation cover, biomass and height as well as a range of abiotic changes including the removal of soil surface cover and alterations to soil biochemistry, light penetration, wind speed, temperature and water flow. Secondly, trails have a range of spatial fragmentation effects such as edge effects that extend various distances from the trail. For example reductions in canopy cover along a trail can increase light, temperature and wind penetration into the adjacent vegetation and hence alter biomass, cover and composition. Trail fragmentation also generates barrier effects, resulting in reduced species and genetic movement across the trail. This can include inhibiting seed dispersal with obvious effects on gene flow and community composition. In contrast, these linear networks can also facilitate dispersal along the trail. This may involve the dispersal of weed seed attached to tourist clothing, bike tires and vehicles, and on the coats of feral animals such as cats, foxes and dogs who also utilize trail networks when hunting. As a result, networks of trails fragment rare and threatened plant communities into both smaller and more degraded patches, altering a range of biotic and abiotic processes and ultimately reducing their capacity to recover from disturbances such as fire, weed invasion and deliberate damage.

Despite the increase in recreation ecology research, the fragmentation effects of trails and trail networks on rare and threatened plant communities have received limited attention in comparison to on-trail trampling and campsite condition studies. The majority of fragmentation research on plants has looked at the effects of external fragmentation imposed by urbanization and agricultural land-use change on forest remnants. This research has concentrated on a range of issues including the effects external fragmentation has on gene flow, microclimate and edge-core gradients. Specifically, research on fragmentation due to tourism and recreation has focused on assessing the effects of infrastructure development and weed invasions, primarily in coastal and montane environments. There is limited work on assessing the internal fragmentation caused by trail networks save for a handful of very recent studies examining fragmentation by trail networks on sub-alpine meadows in Yosemite National Park, USA (Leung and Louie, 2008) and on alpine meadows and steppe vegetation in the Argentinian Andes (Barros and Pickering, proceedings of this conference).

The impacts of trail networks on different Australian threatened plant communities from a variety habitat types will be assessed as part of Ballantyne's postgraduate thesis. This research will assess trail network impacts using patch size and geometry, extent of internal fragmentation (number of sub-patches) and linearity (the ratio of perimeter to area) variables in relation to edge effect gradients. This

includes assessing changes in community composition and soil variables from track center to patch core. Micro-climatic data and trail age along with qualitative information regarding trail condition and use will also be recorded. This research will aim to highlight the importance of fine-scale fragmentation in affecting the composition and long-term quality of plant communities that are already threatened with extinction in Australia.

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# Environmental impacts along informal trails and recreation sites at well-established Swedish nature play areas

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## Introduction

Nature play areas (NPAs) are an increasingly popular technique to combat “nature deficit disorder,” or, the substantial reduction in time spent by children in nature. Such areas began being regularly built in the U.S. and the U.K. less than ten years ago. In contrast, NPAs have been commonly included in Swedish schoolyards for decades.

NPAs have the potential to positively affect our children’s health and environmental sustainability. Studies have suggested play improves self-esteem, motor function, and classroom behavior, while decreases anxiety, depression and attention disorders. Meanwhile, time spent in nature when young has been correlated with environmentally-aligned attitudes and behaviors when older.

Despite these benefits, NPAs are often located in protected natural areas, and their managers must balance recreation activities with their associated environmental impacts. The existing literature on visitor impacts to protected natural areas provides little information on youth-related resource impacts or their management (Vander Stoep and Gramann, 1987; Turner, 2001; Hockett, et al., 2010; Browning, et al., 2012). As more NPAs are developed and opened in the U.S. and U.K., land managers will need to know more about how the unstructured play activities of children affect natural conditions and what techniques are available to avoid or minimize such impacts. Best management strategies for U.S. and U.K. NPAs are currently being developed by trial and error.

This study provides the first dataset on what environmental impacts occur at well-established, Swedish NPAs and how they are sustainably managed. In addition, it includes a preliminary investigation of informal trail creation during children’s play and whether different schools incur different levels of environmental impacts. It is complemented by an earlier study in newly-established U.S. NPAs.

## Methods

Six schools with NPAs were surveyed during the month of June 2012. Another six will be surveyed in July, and will be added to the dataset and analysis presented at the 6<sup>th</sup> MMV Conference in August. Schools were located near or in Uppsala and Stockholm, Sweden, and NPAs were largely mixed hardwood-softwood forests in publically-owned forestland. Each had been operated for at least ten years, sized over 0.5 hectares, and visited by children 100,000 to 400,000 hours annually. Survey methods were adapted from previous recreation ecology studies (Wood, Lawson and Marion, 2006).

At each NPA, ecological impacts were measured. First, child-created informal trail segments were measured. Their overall conditions and average widths were individually as-

essed on a scale from one-to-four. Manager-created formal trails were not measured, because they were visited more often by non-child than child visitors. Next, recreation sites were identified as formal (FS) or informal (IS), based on whether they were manager-created or child-created. Sites were also labeled as “concentrated” if they displayed a sum total of <25% ground vegetation and organic litter cover. Site size was measured using the variable radial transect method, and percentage cover of different ground cover classes were recorded. Conditions at adjacent, ecologically-similar undisturbed sites were also recorded as controls. Multiplying size by percentage difference from site minus control provided estimates of vegetation loss, and organic litter and bare soil exposure. In addition, trees and shrubs over 2.5 cm DBH were counted, measured, and assessed for damage and root exposure.

Finally, informal interviews with school administrators and outdoor classroom teachers were conducted. Open-ended questions were asked about the school, its curricula, and the NPA. Based on these interviews, schools were categorized as “traditional schools” or “nature schools” depending on whether or not their curricula focused on teaching environmental literacy and empathy. Simultaneously, play was observed and resource impacts were qualitatively noted if children were using the site during visits.

## Results

### *Informal trails precursors of recreation sites*

Expansive recreation sites dominated NPAs, and surveying of individual trail segments was difficult. Remnants of informal, interweaving trail networks within concentrated recreation sites were ubiquitous. Correspondingly, only 122 segments were surveyed, and they had a mean condition class of two, or “trail obvious; vegetation cover lost and/or organic litter pulverized in primary use areas.” Average width was category two-of-four, or 0.33-0.66m. Several examples of NPA layouts are shown in Figure 1.

### *Impacts greater at traditional schools*

Aerial extent and intensity of impacts were greatest at FS and IS in traditional school NPAs. Impacts included vegetation trampling, soil exposure and loss, tree and shrub bark and branch damage, and tree root exposure. On average, traditional schools had one FS of size 1547m<sup>2</sup> and four IS of size 792m<sup>2</sup> while nature schools had four FS of size 416m<sup>2</sup> and one IS of size 148m<sup>2</sup>. Aerial loss of vegetation per site was 680m<sup>2</sup> vs. 212m<sup>2</sup> at nature school sites. Average number of damaged trees was 43% (FS) and 31% (IS) at traditional schools compared to 15% (FS) and 21% (IS) at nature schools. Mean number of stumps was nine





Figure 1. Layouts of NPAs

vs. four. Only mean root exposure was greater at nature schools: 28% vs. 22%.

## Discussion

Interweaving trail networks seemed to grow in number and extent until they were indistinguishable from one another. This implied sequence of informal trails networks growing into concentrated recreation sites denuded of ground vegetation suggests trail creation from play should be thoughtfully considered during management. Reinforcing informal trails and developing formal trails with appropriate design and construction may provide long-term NPA sustainability (Leung and Marion, 1999). Ongoing management actions to harden and stabilize both formal and informal

trails may also be effective in minimizing resource impacts, and informal trails that are unnecessary or particularly susceptible to impacts can be closed and rehabilitated. Further research on the transition from informal trails into recreation sites is needed.

How and what curricula are taught to children may also be a major factor of NPA sustainability. One major difference in the curricula of nature vs. traditional schools was the teaching of nature ethics vs. outdoor behavior rules. Observations of curricula delivery and focus groups with children about environmental behavior at the two school types is needed to further investigate these differences.

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# Poster session

# Outdoor adventure- and lifestyle sports

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In recent decades there has been an increasing dynamic interplay in the “borderlands” of sport between closely related phenomena like outdoor recreation and nature tourism (see e.g. Bale 2006, Fredman et al. 2008a and Wheaton 2007). Two trends within these “borderlands” are explored in this study: the sportification of traditional outdoor activities and the liberation of outdoor activities from the landscapes in which they were originally performed. From a perspective of modernization, the following questions are addressed:

1. What is the state of knowledge regarding trends within outdoor adventure- and lifestyle sports?
2. How are examples of activities, places and perspectives within outdoor adventure- and lifestyle sports expressed?

To answer these questions, conventional literature studies of, firstly, academic journals and, secondly; magazines, photographs and commercials, have been conducted. The result shows that tendencies towards the sportification of outdoor adventure- and lifestyle sports (see e.g. Breivik 2010 and Wheaton 2004) and the liberation of these activities from their “original” landscape (see e.g. Daniel 2007 and Bottenburg & Salome 2010) are significant. Of importance from a practitioner perspective is that a “grey-zone” containing several new activities and dynamics is being established in the “borderlands” between sport and outdoor recreation (Sandell, Arnegård & Backman 2011). From an academic perspective, the identified intersection between the climate debate and the nature-related activities that can now be per-

formed indoors is important (see e.g. Sandell 2011 and Sandell & Öhman 2010). Another result that indicates a need for further research is that issues of accessibility, especially for young people, should be considered in relation to the increasing certification and specialization that characterizes the development of outdoor activities (see e.g. Bäckström 2011, Fredman et al. 2008b, Lundvall 2011 and Odden 2008). The current renegotiation of ideals, activities, places and environments related to the traditions of outdoor recreation and sport is discussed, most notably regarding:

- a) Constructions and environments for activities previously performed in “natural” landscapes.
- b) Accessibility to outdoor adventure- and lifestyle sports for young people.
- c) The health aspect of traditional and sportified outdoor activities.
- d) Inclusion and exclusion in relation to outdoor adventure- and lifestyle sports.
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# Financing dedicated recreational areas in the urban proximate environment

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The metropolitan area of Amsterdam is densely populated. Research shows that there is a shortage of outdoor recreational opportunities due to the highly urbanized nature of the region (Gijsbertse, 2008). To facilitate outdoor recreation in the region, several dedicated recreational parks were created. The aim of these areas is to provide space for outdoor recreation and nature for the urban population. The areas feature park-like landscapes build and designed to accommodate different leisure pursuits. These areas are usually located close to the city, either walking or cycling distance from the closest neighborhoods. They are up to 400 hectares in size, and the largest receive up to 2.5 million visits per year.

Each of these areas is governed by a separate governmental entity which manages the areas on behalf of its participants, which are the governments of the surrounding municipalities and the provincial government. Each participant contributes a fixed amount towards the management and upkeep of the areas. However, these contributions only cover part of the costs (from 20% up to 80%). Therefore, other means of financing maintenance and upkeep had to be developed. Part of the answer has been to lease parts of the areas to entrepreneurs to develop commercial recreational activities. However in recent years a combination of the economic crisis, and the age of the areas which necessitates more investments in upkeep, means that securing adequate funding is challenging and new measures have to be devised.

In this presentation we will discuss two of these measures and discuss their impact in terms of revenue, influence on the number of visitors and visitor satisfaction. These experiences are part of an ongoing process to find new and sustainable funding models. We have not yet reached a stage where we can present a general model.

## Methodology

The number of visitors is determined by a combination of physical counting and extrapolation using previously gathered data. Data was gathered on the number of visits, mode of transportation and occupancy rate during several days in different seasons on all entrances to an area. Mechanical counters able to count the number of passing vehicles (bicycles and/or cars) were placed at the main entrances. Using the data from the counters, the total number of visitors is extrapolated by adjusting for traffic through other entrances, other modes of transport and average occupancy rate. Visitor questionnaires were conducted twice, in 2007 and in 2009. The Questionnaire included questions about satisfaction, frequency of visits and safety.

## Paid parking

One of the earlier measures adopted in 2005 in Twiske, a medium size area directly north of Amsterdam, was the

introduction of paid parking. In the 3 years that followed the number of visits to the area dropped 29 %. Only in 2011 did the number of visits start to climb again (by 7%) (RNH, 2012). The visitor's appreciation of the area was not measured before introducing paid parking, but both in 2007 and 2009, paid parking was a complaint frequently voiced by visitors, and it impacted their indicated willingness to re-visit the area (RNH, 2010).

The measure had other unforeseen consequences. The residents of the surrounding municipalities were unhappy with the introduction of paid parking which has negatively influenced the municipalities' goodwill for Twiske which is essential when trying to develop other opportunities for increasing revenue.

A net positive effect of the measure was the decrease of unwanted and criminal activity, some prostitution and other sexual activity in the area. These activities, which were viewed negatively by the other visitors, disappeared after the introduction of paid parking, likely due to a combination of camera supervision at the boom barriers and the actual cost of entering.

Due to the mentioned decrease in the number of visits, paid parking has, so far, failed to raise the predicted revenue. The costs of keeping the system running are more or less equal to the revenues raised. The experience from the introduction of paid parking in Twiske means that in other areas that option will be not be considered, or a much stronger case needs to be made that the benefits, particularly the revenues, outweigh the sizable disadvantages.

## Cutting costs

Cutting costs has been a popular approach in recent years as the financial and economic crisis has put pressure on the finances of the participants. De facto cost-saving measures were taken for many years preceding the crisis because the available budget was insufficient to cover all maintenance needs. The age of the areas, which were completed 30 years ago, means that the low maintenance regime has led to visible deterioration of many of the elements within it, such as bridges, roads and toilets. Since the crisis many elements in bad shape have been removed or closed off entirely and the image of areas with a lower than customary level of maintenance has been institutionalized.

For the purpose of comparing the effects of the lower level of maintenance on the visitor survey we reviewed the data for 4 areas of around 30 years old, with a focus on water and water based recreation. The review shows that those areas in which the level of maintenance visibly decreased and the scope of attractions diminished due to age of the facilities show a continuing decrease in the yearly number of visits. Figure 1 shows the number of visits per year expressed as a percentage, using the number of visits in the first year as benchmark set to 100%.

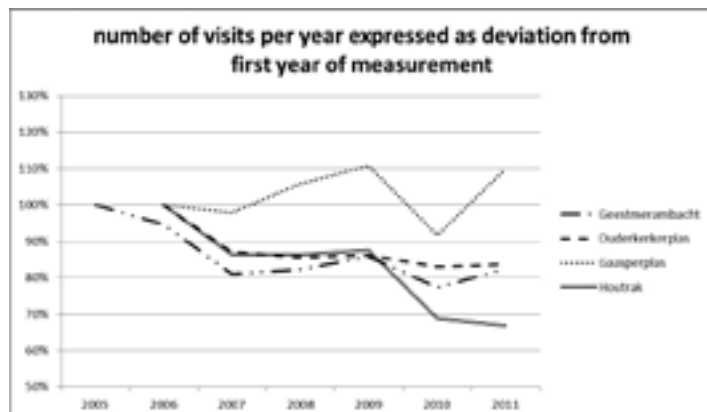


Figure 1. Number of visits per year.

The areas which escape this trend are those which offer a wider range of activities than those which fall under the traditional range of recreation (hiking, bicycling, sunbathing, swimming etc.), and continue to develop new offers. As visible in the figure, the number of visits to Gaasperplas increases against the trend when a new facility (indoor playground) was opened in 2008. Newer areas, created in the last decade, do not show a downward trend. In conclusion, cost saving measures that have visible consequences seem to correlate with a decrease in the number of visits unless new attractions are developed in parallel.

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# Do we need mapping of tourist flows? Lessons from Börzsöny Mountain

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## Introduction

Visitor management and research on carrying capacity in nature parks (natural areas) requires good data about visitors (e.g. numbers, flows, habits and knowledge (Rupf, Wernli and Haller, 2008)), but the Hungarian national parks typically do not collect this type of information.

The main reason why outdoor recreation counter systems are not used is the high costs. Entry to national parks and protected areas in Hungary is possible from multiple directions, therefore is not possible to assign a few points using counter system. The rationalization of the touristic pathways had not been fulfilled at the designation of the protected areas, because the touristic infrastructure had formed earlier and the demands of hikers were ignored in most cases (Benkhard, 2004). Recently manual GPS units, which are often used by hikers are becoming increasingly popular in Hungary. However, information from these units do not provide complete information about visitor traffic (i.e., GPS data do not reflect the number of the people in the group).

The situation described above is also in Börzsöny, which is part of Duna-Ipoly National Park. This park is becoming busier because of its romantic landscapes and proximity to the capital (50 km). There is not constantly populated areas in the middle of the mountain (so called Central-Börzsöny) because of its natural conditions and the high proportion of privately owned areas in the past. The built infrastructure, along with most of the area's economic activities are connected to the tourism. This is a unique among Hungarian national parks. National park management, which has often acted against the interests of tourism providers, forest management, as well as hikers require above mentioned data for the formation of acceptable visitor management. So we made the visitor flowing map of the mountain.

## Methods

This study focused on hikers and visitor counts were made by volunteers (mainly university students). We chose the location of counting points so that every hiker that went to Central-Börzsöny was counted, which resulted in a total of 14 visitor counting points. We made this measurement from 8 am to 4 pm, 5 days at the weekends and 3 days on weekdays. Count data included the place and time of the count, the number of the hikers and the (planned or completed) route which was described by formal trail markers (Hungarian Standard, 1988). We asked the visitors about their route before the excursion (mostly in the morning – it can be only a planned route) or after their walk (completed route, generally asked in the afternoon, those tourists who started their hiking earlier than 8 am). Thanks to this we do not calculated one hiker twice.

Every route segment was assigned the number of the tourists individually who use that route. We represented visitor flows by using different thickness of stripes on a map (the greater flows are represented by greater stripe thickness). The flowmap was created with the open source software Quantum GIS, based on free online data of SRTM, OpenStreetMap. We also received hiker path data from [turistautak.hu](http://turistautak.hu), which is a professionally edited hiking online database.

This paper shows a part of the results of the larger study. The study period of this part was 2 days in an autumn weekend in 2010. The map (Figure 1.) shows only that marked tourist paths of the Central-Börzsöny, where at least one visitor was counted. The five classes clearly represent differences in visitor density.

## Results and conclusions

The analysed weekend 801 visitors passed through the counting points. Willingness to respond was good (80%), but the data (described by trail markers) were inaccurate in many cases. People who answered inaccurately came from southern areas. We realised that several people set off on even longer trips (20 km) without a map or plan. According to previous information, south areas (close to the capital) which can be reached easily by car and public transport (bus, train) are the busiest starting points. The most frequented points are the highest peaks of the mountain, where a look-out tower (e.g. Csóványos, 261 visitors), tourist house (e.g. Nagy-Hideg-hegy, 289 tourists) and memorials (e.g. Foltán-kereszt, 82 hikers) can be found. The number of hikers in the groups varied between 1 and 50 persons. The total length of the routes used by hikers during the study period was 74 km.

The data of the visitor flow map are basic information for the follows:

- Using the map overlays method (Payraudeau and van der Werf, 2005), these data compare with data of other layers (e.g. slope, soil types, botanical map, tourism infrastructure, categories of nature protection) are the critical areas detectable.
- Help determining the necessary and potential bypasses.

We cannot solve this latter aim without the knowledge of the individual opinion of hikers'. For this reason we examined this factor with questionnaires. Hopefully the results facilitate for the management to take interventions which are acceptable to all.

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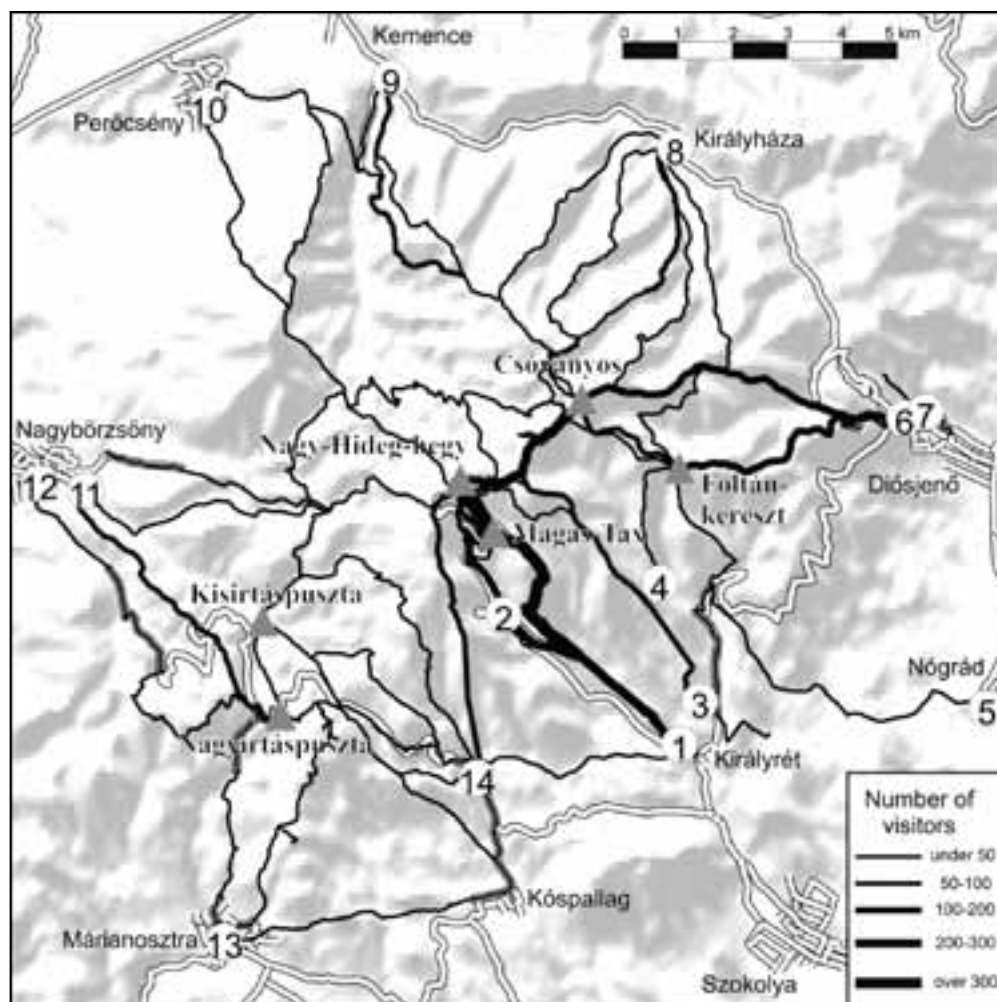


Figure 1. Visitor flow map of Central-Börzsöny

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# Observing children's play in Naturescape: Key findings relating to social and environmental interaction

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Research undertaken in 2010 by the Centre for the Built Environment and Health (CBEH) at The University of Western Australia for Kings Park Botanic Garden and Parks Authority (BGPA) explored child and parent perceptions and preferences relating to outdoor and nature-based play environments. The primary findings of this study (Child's Play) indicated that children desired more interesting and challenging play spaces that incorporated natural elements such as trees, rocks and water. Parents indicated they would like their children to have more opportunities for nature-based play that encouraged physical activity and physical risk, though counter-balanced many of their statements with concerns about safety and lack of access to suitable nature play settings.

Based on these findings, BGPA commissioned an observation study of their newly constructed nature-based activity area. Rio Tinto Naturescape Kings Park is a place for children to connect with nature and learn to appreciate the unique Western Australian environment. It is designed as a place to explore, climb rocks and ropes, wade through creeks, build cubbies and get dirty. It has been designed to retain its bush setting and provides a level of challenge, adventure and connection to nature that is missing from many urban parklands (Botanic Gardens and Parks Authority, 2012).

Over two days during spring 2011, the behaviour of 372 children (accompanied by adults in either family or school groups) was observed within six activity areas. Quantitative and qualitative data was collected by a team of trained observers using a data collection instrument developed specifically for this project. A standardised observational tool was developed by the CBEH research team using previously validated instruments used to record children's levels of physical activity, engagement with others and play environment (Ridgers et al., 2007). Methodologies and outcomes of previous observational studies were also examined to determine how best to record social interaction and behaviours associated with risk-taking in more natural play settings (Sandseter, 2007, Brown et al., 1996). Pre-

vious research and review of related literature conducted by the authors was also used to inform the development of the observational tool (Martin, 2010, Wood et al., 2010)

Particular attention was paid to: observation of the type and frequency of children's interaction with different activity elements; positive/negative environmental interaction by children; positive/negative social interaction between children; sizes of groups playing together; and adult involvement in play. Following the family day, use of the observation tool was reviewed. Site specific tools were developed to reduce the complexity of the original form and facilitate faster, more accurate recording by observers.

In addition, children, parents and teachers were surveyed to gauge children's perspectives of specific activity areas; adult overall perspectives of Naturescape; and identification of potential safety issues. Data collected was used to develop strategies to maximize play and educational opportunities within Naturescape.

Our research findings provide some unique observational data not captured in previously published studies. While a number of studies have observed children in school and other outdoor play settings, we believe this may be one of the first studies to specifically focus on how children play in natural environments. This presentation will provide an overview of the research methods used and discuss key findings, particularly those relating to social and environmental interactions.

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# The conditions of development and tourism management in Polish mountain national parks included in the “Man and the Biosphere” programme

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The “Man and the Biosphere” UNESCO programme was launched in 1974-1976. The concept of the programme assumes the existence of three protection zones: the core zone, the buffer zone and the transition zone. The main 3 functions of the programme include the protective function, the sustainable development function and the educational function. The zone with the highest protection level is very precious from the point of view of environment. Also, it is very sensitive to human impact. The biosphere reserves are under the jurisdiction of the countries in which they had been created (Prato, Fagre, 2005). In Poland there are 4 national parks included in the “Man and the Biosphere” programme: Tatra NP, Babia Góra NP, Bieszczady NP and Karkonosze NP.

One of the objectives of this paper was to compare tourism management methods in selected national parks. Referring to the parks’ websites, I have analysed various forms of cooperation between the park management and the tourists, as well as educational and tourist offers of the parks. In each of the parks in question people may only follow specific tourist or educational routes. Moreover, in Karkonosze NP it is possible to paraglide after obtaining a special permit. In Tatra NP people may enjoy rock climbing or speleo climbing. In Babia Góra NP it is possible to make fire but only in places designed for such purpose. Bieszczady NP is the only Polish park that belongs to the PANParks (Protected Area Network) the objective of which is to improve tourism management methods in protected areas (S.P. Cottrell, 2004). All of the above mentioned parks offer educational activities, such as travelling educational routes, lectures, exhibitions and knowledge competitions. The offer of Tatra NP and Karkonosze NP is especially worth noting. Both parks offer a lot of educational activities and organize social campaigns, competitions and workshops aiming at increasing tourists’ awareness of the value of nature. Also, these parks organize their partnership with the tourist in the form of voluntary work.

In order to specify the level of the influence of management on tourism, a survey has been carried out. There were 749 tourists involved in the survey: Tatra NP (181 people), Bieszczady NP (198), Karkonosze NP (198) and Babia Góra NP (172). The tourists were asked to evaluate

their partnership with the park management using the 0–5 scale. Also, they were asked if they know the tourist and educational offers of a given park, if they used such offers, and if they browsed through the park’s website. In the opinion of the tourists, the offer of Tatra National Park is the best, and the offer of Bieszczady National Park is the worst. According to the survey, most tourists have not heard about or used the tourist and educational offers of a given park. In this regard, the tourists have the best opinion about the Tatra NP and the Karkonosze NP – about 14% people know the offer of those parks but few people used the offer. Most tourists do not browse through the website of a given park (53-62%). On the basis of the above mentioned survey one may conclude that the management does not exert a significant influence on the tourists’ choices.

Another objective of the survey was to determine the tourists’ motivation. According to the survey, there are a lot of different motives for carrying out tourist activities in selected national parks. The motives have been grouped into a few categories: hiking/recreation, learning about a given place, curiosity, the love of mountains, contact with nature, taking photos, relaxation or other motives. The tourists taking part in the survey could select more than one answer. Most of them specified the following as the main objectives of their trip: the love of mountains, relaxation or hiking.

Also, the tourists were asked about how often they came to a given park, how long they were going to stay, what kind of tourist activities they were going to be involved in and what kind of equipment they brought with them. Moreover, they were asked why they chose that particular national park. The reasons why most of the people chose a given park include: the nature of that particular park, the love of that place, a short distance from the place the tourists live in or the recommendation of the family members. Few tourists got interested in a given national park because of its website, which confirms the theory about the insignificant influence of the management on tourists’ choices. The majority of the tourists do not perceive the National Park as the institution that manages the amenities of nature.

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# Planning and management of visitor impacts in traditional communities in the Reserva Extrativista do Rio Unini, Amazonas, Brasil

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## Introduction

The Extractive Reserve of the Unini River, located in the Ecological Corridor of Central Amazon, Amazonas, Brasil, is endowed with great potential to become an important destination for community-based tourism. Community-based tourism has only recently been introduced into the Unini River region. Prior to 2007, the only tourism developed in the area was sport fishing. However, since 2010 much has been done to increase the sensitivity for, and improve the planning of, community-based tourism in the region.

Many values of the Reserve were recognized such as the traditional activities of the inhabitants, the luxurious scenery of fluvial beaches, river rapids and aquatic and terrestrial trails. For example, Serrinha Trail is characterized by huge trees and beautiful buriti palms which attract a variety of animals, and therefore is considered to have an appealing quality in the reserve. This paper presents a project for managing the impacts in the Serrinha Trail region. This project relies on the engagement, capacity, and labor from the local communities in the region. This approach capitalizes on traditional knowledge in order to enable the local community to manage visitation autonomously.

## Method

The Guide Book for Visitation Impacts Management (MMA/ICMBio, 2011) was used as a foundation and the project began with the convening of the Unini Trails Group, which gathered managers and local people. Thereafter the deliberative body in the protected area called an assembly to determine the theoretical and practical issues in managing visitor use in the Serrinha Trail region. Two workshops were carried out to examine the concepts of planning and managing visitor impacts on trails, (i.e., minimizing negative and maximizing positive impacts). Outdoor activities were also conducted that helped researchers understand the field conditions as well as identify the trail's most crucial areas. This enabled the Unini Trails Group to consider the best strategies for managing impacts.

## Results

The process described above resulted in the selection of indicators and the articulation of strategies to mitigate the impacts of trail visitation. Indicators were defined in a participative way in order to evaluate environmental, social, and visitor experience conditions (see Table 1).

In order to define indicators, specific characteristics of the conservation unit were taken into consideration as well as the conditions to check them. The management plan-

ning and visitors impact checking are then discussed in a progressive and adjustable way, and after checking indicators, it will be possible to identify the actions to be taken in order to minimize negative impacts as well as the creation of new indicators. For the next community workshop the indicator analysis and the specific pattern for each indicator will be foreseen. The base line of the Serrinha Trail will be measured, as well the planned interventions to settle the trail down.

## Discussion and Conclusions

Because trails are established mainly to protect natural resources and to improve visitor security and satisfaction (Lechner, 2006), the impact monitoring stage is considered to be the most important stage in the management and planning process. Therefore, monitoring should be systematic and cyclic (MMA/ICMBio, 2011). The participative planning experience from the Serrinha Trail turned out to be very positive. The inhabitants declared that although they know the area quite well, they are now acquiring technical knowledge along with the ability to share trail management in their communities. The responsibility for trail management rests in the hands of the community. This is essential because the trail is a resource for the community-based tourism approach. By the end of the Unini Trails Project, the participants should be ready to develop the same approach in their communities and be able to ultimately support other communities.

Table 1. Indicators Matrix for the Serrinha Trail visitation impacts management

<b>Indicator</b>	<b>Measured Variable</b>	<b>Indicator Pattern</b>	<b>Strategy for Impact Mitigation</b>
Garbage left behind on trail	Garbage	Environmental	Instruct inhabitants and visitors to bring back the garbage.
Number of secondary trails	Bypaths disfiguring trail traces	Environmental	Close secondary trails. Instruct guides to avoid opening secondary trails
Inscriptions or marks on trees	Inscriptions on trees – Inhabitants and guides use samples from trees to smell or taste.	Environmental	Instruct inhabitants and guides to avoid damaging trees; Provide in advance an explanation and identification samples to avoid damaging trees.
Number of inhabitant-complaints about the use of the area by tourists	Disturbance to traditional activities as a result from tourism	Social	Establish rules to avoid disagreements for the use of the area; Instruct inhabitants, guides and visitors to treat the area respectfully.
Number of visitors complaints about trail management.	Visitors contentment regarding trail management	Visitors experience	Analyse complaints periodically in order to refine procedures.

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# Equestrian tourism in Niepolomice Forest – conditions of development and its impact on natural environment

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The Niepolomice Forest is large forest complex set on the east side of Cracow, Poland. It is located within the Sandomierz Basin, on the confluence of the rivers Raba and Wisła. The forest covers about 110 km<sup>2</sup>. From the botanical and morphological point of view it can be divided into two parts: the main part occupied about 80% of whole complex is pine and mixed forest and the second, smaller part is deciduous forest. In the Niepolomice Forest there were implemented several types of natural environment protection. The most important of them are: nature reserves (there are 6 reserves in the forest concentrated on protection of unique plant complexes), natural monuments (represented mostly by very old oaks) and protection of particular species of plants and animals. The forest is famous especially because of continued here from the end of second world war breeding center of Polish wisent.

The Niepolomice Forest authorities have prepared for tourists walking tracks (total length about 33.2 km), bicycle tracks (total length 8 km), didactic path (3.5 km length) and horse riding trail (8.5 km length). Horse riding is becoming more and more popular recreation in Poland these days. This makes also big interest of people who want to practice horse riding not only in studs and equestrian schools but also in nature considering beautiful landscapes. The trail for equestrian tourism in Niepolomice Forest was signed in 2003, it is about 8.5 km length and it is located in western part of the forest. The loop of the trail covers about 1.5 km<sup>2</sup>, less than 1.2 % of the whole forest complex. Except of this one trail, horse riding in the Niepolomice Forest is now forbidden. The horse riding trail is equipped with a basic infrastructure like bulletin boards (at the starting and end points of the trail), barriers (also at the starting and end points – used to tie a horse for a moment just before starting the trip) and natural hurdles (like fallen trees). The location of the trail makes it available only for riders from stables set on the south-west side of the Niepolomice Forest. The authorities of the forest do not lead already any monitoring of number and type of tourists using the horse riding trail.

On the basis of observation and information available in the Internet it can be said that there are up to 10 stables located in the nearest surroundings of the forest. Some of them are private and 6 are recreation stables leading riding lessons. The location of these stables and also the huge opportunities offered by the Niepolomice Forest for horse riding make a possibility and need of creating some more trails in the forest. The Niepolomice Forest includes areas advantageous for horse riding. Most of all there are many sand paths which can be safely and with low investments use for creating new trails. Research done in the Niepolomice Forest shows that there are tens of kilometers of paths where the trail could be led. Because of fact that all of the trails in the Niepolomice Forest are dedicated for one day trips there is no need of putting in the forest any dedicated infrastructure.

The impact of equestrian tourism on the natural environment of the Niepolomice Forest can be defined as slight. This is most of all trampling plants along the trail and disturbance of wild animals.

Summarizing, the development of equestrian tourism in the Niepolomice Forest depends on the authorities. The proposal of signing new horse riding trails presented on the poster is just one of the possible solutions. But it is worth saying that signing some more trails would make the Niepolomice Forest more available for local riders and more attractive for tourists. It would also give a possibility of organizing some events and horse riding competitions.



# Understanding residents' risk perceptions associated with fatal brown bear accidents: A case study in Shibetsu town, northern Japan

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The purpose of this study is to examine how residents around the protected areas perceive risk from fatal brown bear (*Ursus arctos*) accidents. In addition, we investigate the association between their risk perception and their backgrounds in order to design an effective risk communication. The protected areas are set up for the conservation of wildlife, but there is significant potential for human-wildlife conflicts, and the areas could well become a target for criticism (e.g., Treves 2009). Hence, it is important to understand the attitudes, behavior, and perception of stakeholders around the areas and reflect them in wildlife management. In particular, brown bear management poses a challenge for wildlife managers because bears routinely leave the areas and have strongly negative impacts – including fatal accidents on surrounding communities. To consider an appropriate bear management, information about the communities' risk perceptions is needed. That is because the risk concept is integral to bear management, and may help the wildlife managers in decision-making (Gore et al. 2009).

Our research site is the town of Shibetsu in Hokkaido, northern Japan. It is located near the Shiretoko National Park (a World Natural Heritage Site). The park is a high bear density area and provides visitors with bear-viewing opportunities; however, the town has the problem of nuisance encounters with bears. The number of nuisance encounters has increased rapidly in recent years, and managers are experiencing difficulty in balancing the conservation and mitigation such conflicts.

## Methods

We conducted a questionnaire survey. In July 2011, we mailed questionnaires to 1,200 residents, aged from 20 to 79, who were selected randomly. A total of 515 questionnaires returned, representing a 43.2 % response rate (excluding eight non deliverable questionnaires). The questionnaire included 12 questions designed to evaluate the risk perceptions of fatal bear accidents. The questions were developed from studies of risk perception (Gore et al. 2006; Kubo et al. 2011; Slovic 1987). Risk perception was measured using the five-point Likert scale. In addition, we examined residents' backgrounds (characteristics, experiences with bears, and attitude toward bears) to identify any association with their risk perceptions. In this study we analyzed data from 470 questionnaires with completed questions.

## Results and discussion

Four principal factors concerning fatal bear accidents were obtained from a principal component analysis (PCA).

The first component is escapability: this rated highly in accident-avoidance statements. The second component is control: this rated highly in statements of intervention by public authorities. The third component is seriousness: this rated highly in the statements of magnitude of an accident. The last component is responsibility: this rated highly in accident-liability statements.

Furthermore, a cluster analysis using the PCA factor loadings identifies three groups of respondents with significantly different risk perceptions. The first group (n = 145) regards the risk as serious and uncontrolled. In addition, it has a negative attitude toward bears because its members are engaged in agriculture and have had negative experiences with bears. The management of this group needs to be prioritized because it has a strong perception of risk on the basis of negative experience but does not perform action voluntarily. Thus, the managers should therefore actively design risk communication to alter their behavior. The second group (n = 117) does not consider the risk as serious but controlled. Members of this group tend to engage in work outside agriculture and have less experience with bears. In addition, they are older than those in the other groups. Thus, they could be interpreted as people who understate the risk because they have had less exposure to bears. The managers should pay attention to the human-bear interaction trend (i.e., the number of encounters), although they need not perform any particular action for this group. The last group (n = 208) regards the risk as uncontrolled and cannot be escaped. In addition, it shows a positive attitude toward bears. Members of this group are younger than those in other groups and satisfied with current bear management practice. In addition, they express the intention of attending lectures about bear management. This group could be interpreted as a desirable group from the managers' point of view in terms of achieving a balance between conservation and mitigation. However, the members should draw a positive image of bears because they only have experienced of bear viewing.

## Conclusions

To sum up, residents have heterogeneous risk perceptions of fatal bear accidents, and their risk perception is associated with their backgrounds. To improve risk communication, it is necessary to consider this association.



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# Management of protected areas in urban fringe area of Tama Hills, Tokyo, Japan

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## Introduction

### Study Site Description

Tama Hills (*Tama Kyuryo*) are located between Tokyo Metropolis (*Tokyo-to*) and Kanagawa Prefecture (*Kanagawa-ken*), west of central Tokyo and north of Yokohama City in Kanagawa Prefecture, including a part of the first and second largest populated cities in Japan. Surrounded by several rivers, those areas are about 300 square km, used to be countryside and fringe of urban areas, conserved balanced natural and cultural environment including paddy field, farmland and coppice (*satoyama*) owned by both private (mostly farmer) and as common district. However, since highest point of the hill is about 220 meters above the sea level, development especially for residential area started from 1950s because of the convenience to commute to downtown Tokyo and Yokohama. Two large developments, Tama New Town in Tokyo and Kohoku New Town in Kanagawa, in 1960s to 70s changed almost all the land.

### Methods

The author analyzed the history of Tama Hills concerning land use – decreasing natural areas and farmland, including traditionally used paddy fields and increasing protected areas – and collected historical information on activities and management body/person in the hills through literature, discussions with personnel of local governments and member of non-profit organizations.

### History and transition of land use and management

Government-leading conservation of the land is initiated as well as development. Fortunately, there are some fragments of protected areas designated by local government in recent years. For example, from 1978, Tokyo Metropolis government started to conserve Zushi-Onoji Historical Environment Conservation Area in Machida City, Tokyo. This plan included about 50 hectare and designated about 36 hectares until today (2012), but abandon of traditional land use and impact of visitors are becoming new issues to conserve.

Consequently, not only the power of ‘new’ local communities are leading to make volunteer groups in order to oppose to the development in early days but changed gradually to manage those areas for conservation and recreation (Ueda, 2012). In other hand, ‘old’ local communities which have abundant of traditional and precious knowledge and techniques to conserve those hill environments are in the spotlight again as one of the areas for conducting the concept of “New Public Commons” (Cabinet Office, 2010) in Japan. Additionally, objective of conservation is set not only the patch of the two- (or three-) dimensional “land,” but also the one- (or long two-) dimensional “path” from around 2000, regardless of land ownership. The first guide map to introduce as the footpath in Japan about the countryside walking route as footpath has been published in 2002 (Midori no Yubi, 2002). This will guide to the hidden paddy fields and lost environment in urban fringe in Tokyo, not as old mountaineering course, and that was one of epoch making event in Japan. These activities and publishing were made by one of the NPOs in Tama Hill. Eventually not only in Machida City but in some cities/towns such as in Hokkaido, Yamagata and Yamanashi Prefecture have started making routes for footpath or designation by various organizations, too. Hokkaido is one of the northernmost islands in Japan with elements of countryside landscape similar to those in England, birthplace of the footpath. In 2009, “Japan Footpath Association” (translation of “Nippon Footpath Kyokai”) was created and the headquarters is located in the Machida City. These movements of conservation has changed and broadened the purpose of the conservation body to promote restoration of the beautiful landscape and improve visitors health.

Table I. Transition of farmland and natural area in Tama Hills, Tokyo

Period	~1950s	1960s~70s	1980s~90s	2000s~
Status of the Land of farmland and natural area	Traditional public common (from 1600s circa)	Development for (converted to) housing and road	Land conservation by government	New public common
Typical land use	Paddy field, farm, coppice, grassland and undeveloped natural area	Housing, road, abandoned and undeveloped natural area	Housing, road, abandoned and undeveloped natural area, and protected area	Housing, road, undeveloped natural area, protected area, including restored rice paddy field and coppice
Management of farmland and natural area	Mostly farmer	Government and farmer	Volunteer (non-farmer) farmer, and government	Traditionally-skilled volunteer and new volunteer, and government

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Midori no Yubi Ed.(2002) Tama Kyuryo Footpath I – Sansaku Guide Map – (Tama Hills Footpath I – Walking Guide Map-), Midori no Yubi (Nonprofit Organization for Specified Activity), 14pp. Tokyo. (in Japanese)

Ueda, Saori (2012) A study on the continuity of green environmental volunteer activities in the public suburb green environment, Tokyo University of Agriculture, 74pp. Tokyo. (in Japanese with English summary)

# Cross-cultural models of customer services: The case of Taiwan and U.S. forest recreation visitors

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## Introduction

Nature recreation destinations such as national forest recreation areas have received significantly increasing visitation globally. Given increasingly diverse visitor populations, including changes in racial and ethnic composition, the topic of diversity has become important to national forest resource managers. Previous studies have found differences between cultural/ethnic groups in parks and recreation areas (e.g., Li et al. 2010; Manning, 2010). Why did these differences exist between cultural/ethnic groups? Understanding factors affecting visitor satisfaction can help managers provide niche recreation opportunities for their culturally diverse clientele (Burns and Graefe 2005). The purposes of this study were to explore the influences of four concepts including values, socio-demographics, crowding, and past recreation experience on visitor satisfaction in different cultural groups (i.e., Taiwanese Hoklos, Taiwanese Hakkas and Anglo Americans), and to provide research implications for the management of outdoor recreation and tourism.

## Methods

In 2011, we surveyed visitors to Basiashan National Forest Recreation Area and Aowanda National Forest Recreation Area in central Taiwan, as well as the Timberline Lodge Recreation Complex in the Mt. Hood National Forest in Oregon, U.S.A. Because the national forest areas were vast, a simple random sample of all visitors within the setting would not yield an adequate number of respondents for comparisons. Therefore, we used a purposive on-site convenience sampling approach at sites known to be heavily used by visitors. In Taiwan, we focused mainly on locations such as the visitor centers, nature centers, picnic areas, parking lots and trail heads. In the U.S. surveys, we interviewed visitors at the Timberline Lodge Recreation Complex; a setting with similar survey points (visitor gathering areas, and parking lots). We adopted a systematically random selected approach. At each site, every third visitor was asked to complete the on-site questionnaire to maintain a random selected manner (Salant and Dillman 1994). Overall, we obtained 1251 usable questionnaires, with 525 Taiwanese Hoklos, 102 Taiwanese Hakkas and 624 Anglo-Americans.

We first used exploratory factor analysis (EFA) to reduce the 16 satisfaction items into factors and derived 4 factors in each groups, respectively. Multiple regression analysis was then used to test the predictive power of 4 value dimensions, socio-demographics, crowding and past recreation experience on each satisfaction factors resulting in 16 multiple regression models.

The satisfaction factors derived from EFA in each cul-

tural group served as the dependent variable in the regression testing. The four LOV dimensions (respect, harmony, achievement, and hedonism), four socio-demographic variables (age, gender, education, and income), crowding and two recreation behavior variables (first time visit and visit days of other recreation area) served as the independent variables in the multiple regression testing.

## Results

In the overall sample, the four regression models were all significant at the .001 level, with R-square ranged from .12 to .12. The significant independent variables ranged from 2 to 9 variables across the models. The crowding variable was the most important factor affecting satisfaction, followed by the hedonism dimension. In the Hoklo group, the four regression models were all significant at the .001 level with the R-square ranging between .06 and .32. The significant independent variables ranged from 2 to 3 variables across the models. The crowding variable and first time visit variable were the most and second important factors affecting satisfaction across the four models.

In the Hakka group, 3 out of the 4 models were significant from the .05 to .001 level with R-square ranged from .17 to .21. The significant independent variables ranged from 2 to 3 variables across the models. The crowding variable and harmony dimension were the most and second important factors affecting satisfaction across four models. In the Anglo-Americans group, the four regression models were all significant from .05 to .001 level with R-square ranged from .02 to .15. The significant independent variables ranged from 4 to 5 variables across the models. The crowding variable and harmony dimensions were the most and second important factors affecting satisfaction across the four models. The detailed model statistics were shown in Table 1.

## Discussion and conclusion

We found that the crowding variable was the most powerful predictor across all of the multiple regression models. The results showed that as crowding increased, satisfaction decreased. The results were consistent with the findings of previous research. For instance, Shelby (1980) reported a significant negative relationship between crowding and satisfaction. We also found the hedonistic and harmonious values tended to positively affect satisfaction, reflecting the saliently predictive power of values on satisfaction.

In conclusion, this study revealed a few significant independent variables regarding crowding, socio-demographics, values and past recreation experience in predicting satisfaction for different cultural groups. However, we found the

Table I. The significant and most/second important factor predicting visitor satisfaction in different cultural groups models

	Model1	Model2	Model3	Model4	Most important/ second factor
	First Satisfaction factor	Second Satisfaction factor	Third Satisfaction factor	Fourth Satisfaction factor	
<b>Overall</b>	crowding	crowding	age	crowding	crowding
Model1	harmony	education	hedonism	education	hedonism
F= 13.83***	F=22.08***	income		income	
Model3	gender	respect		harmony	
F=12.31***	F=21.26***	visit other area	achievement		
		hedonism	gender		
		visit other area	first time visit		R <sup>2</sup> ranged from .12 to .20
Total sig factors	5	9	2	4	
<b>Hoklos</b>	crowding	crowding	crowding	crowding	crowding
Model1	education	respect	age	first time visit	first time visit
F= 5.70***	F=5.34***	first time visit	first time visit		
Model3					R <sup>2</sup> ranged from .06 to .32
F=2.91***	F=14.79***				
Total sig factors	2	3	3	2	
<b>Hakkas</b>	crowding	age	crowding	None	crowding
Model1	age	gender	harmony	significant	age
F= 2.20***	F=2.53*	income			
Model3					R <sup>2</sup> ranged from .17 to .21
F=2.65**					
Total sig factors	3	2	2		
<b>Anglo-Americans</b>	crowding	crowding			crowding
Model1	education	harmony			harmony
F=7.42***	F=6.79***	income	hedonism		
Model3	harmony	first time visit			R <sup>2</sup> ranged from .02 to .15
F=1.87*	F=2.44**	first time visit			
Total sig factors	5	4			

explanatory power in testing was relatively weak, as indicated by the model R-square values. We suggest two points in future research to improve the predictive power of satisfaction. The first is to improve the measurement of variables. For instance, we advocated to developing additional value measures to predict satisfaction in each cultural group to increase the model significance. The other is to develop more

advanced statistical method, e.g., using structural equation modeling or non-linear model testing to examine the models. We expect more explanatory findings in predicting visitor satisfaction in the future with more reliable and valid measures of variables as well as more sophisticated statistical testing.

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# Exploring the human dimension: visitor use analysis of Willmore Wilderness Park, Alberta, Canada

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There have been few studies that have focused on park visitors in provincial wilderness areas within Alberta, Canada. Visitor information for Willmore Wilderness Park has been identified by park managers as an important knowledge gap and relatively little is known about park visitation in Willmore. Historical existing user-profile data collected for Willmore Wilderness Park are sparse and out-of-date. Willmore was created in 1959 (officially named in 1965) and is located in the Rocky Mountains straddling the Alberta and British Columbia provincial border. It lies adjacent to Jasper National Park which is a member of the UNESCO Rocky Mountain World Heritage Site (Figure 1). Willmore is a remote and extensive natural landscape that is approximately 4,600 km<sup>2</sup> in size, and consists of a variety of rugged mountains, gentle ridges, extensive valleys, important headwaters, and a diversity of flora and fauna species. Being Alberta's largest wilderness provincial park, Willmore is popular both recreationally and also politically, so a solid evidence-based management plan is required that is based on sound visitor information.

Gathering visitor use information in protected areas is challenging, particularly in wilderness areas. This is because wilderness areas typically have multiple access points, light and variable use levels, and low densities (Dawson and Hendee, 2009). Gathering visitor information is important as described by Dawson and Hendee (2009, pp.370) "an understanding of the amount, character, and distribution of recreational user is essential to wilderness management because such use is the cause of many impacts, the source of many wilderness values and potential funding". The combination of traditional visitor monitoring study instruments (e.g., surveys) along with emerging technologies (e.g., trail cameras) may improve the collection of information about park visitors. Recent studies have utilized mixed-methods approaches to combat strengths and weaknesses of individual study instruments and appear to have good potential for future development, refinement, and applications. Some examples of mixed-methods studies have utilized on-site surveys/interviews coupled with personal data assistants (PDA) equipped with a Geographic Information System (GIS) and Global Positioning System (GPS), (Lai, Li, Chan, and Kwong, 2007), trail counters, trail cameras, GPS tracksticks, and trail intercept surveys (Simic, 2008), and self-registration books and infrared trail counters (Shoji, Yamaguchi, and Yamaki, 2008).

The purpose of this study is to address the need for acquiring an improved understanding of Willmore visitors. Specifically, this study will examine the demographics, trip patterns, motivations, park management preferences, visitor knowledge about the park, and the sense of place relationship of visitors to Willmore. This project utilizes a mixed-methods approach including: trail surveys, in-depth

mail surveys, trail cameras, GPS tracksticks, and in-person/telephone semi-structured interviews. Trail surveys were distributed through trailhead kiosks, local visitor information centers and through the Internet. In-depth surveys were mailed out to users who provided their contact information on the trail surveys. Visitor characteristics and visit information were acquired by placing trail cameras (Reconyx PC) at the main trail entrance at each of the four staging areas into Willmore (on the Alberta side). GPS tracksticks were deployed to capture satellite-based route information about users and to also test their practicality within a wilderness setting. Lastly, a series of semi-structured questions, either through the telephone or in-person, were posed to park users in an in-depth interview that focused on sense of place. Interview participants were selected through a snowball sampling technique. The fundamental research questions include the following and mainly focus on park visitors using the four main Alberta staging areas for Willmore:

1. What is the visitation level in Willmore Wilderness Park?
2. What are the visitor characteristics, motivations, level of knowledge of the park, and park management preferences of Willmore users?
3. What are the spatial patterns of visitor use?
4. What are the trip characteristics and the main activities of Willmore users?
5. What is the relationship and sense of place between visitors and the park?

Preliminary project results related to these main research questions will be discussed through this poster presentation including selected results from trail cameras and trail surveys, GPS tracksticks, and in-person interviews. This project contributes to protected areas management in five ways:

1. It fills a knowledge gap and provides visitor information for the study area;
2. Supplies a pilot approach that can be applied to other protected areas, parks, natural areas or recreation areas;
3. Creates foundational information for future research in Willmore;
4. Enhances the understanding of sense of place, which is important in forecasting points of future conflict in the park; and
5. Contributes to the body of knowledge related to visitor monitoring.

By understanding more about users and what they prefer or desire in Willmore, this project will help balance conservation with recreation objectives. The information, summaries, figures, and conclusions from this work will be suitable

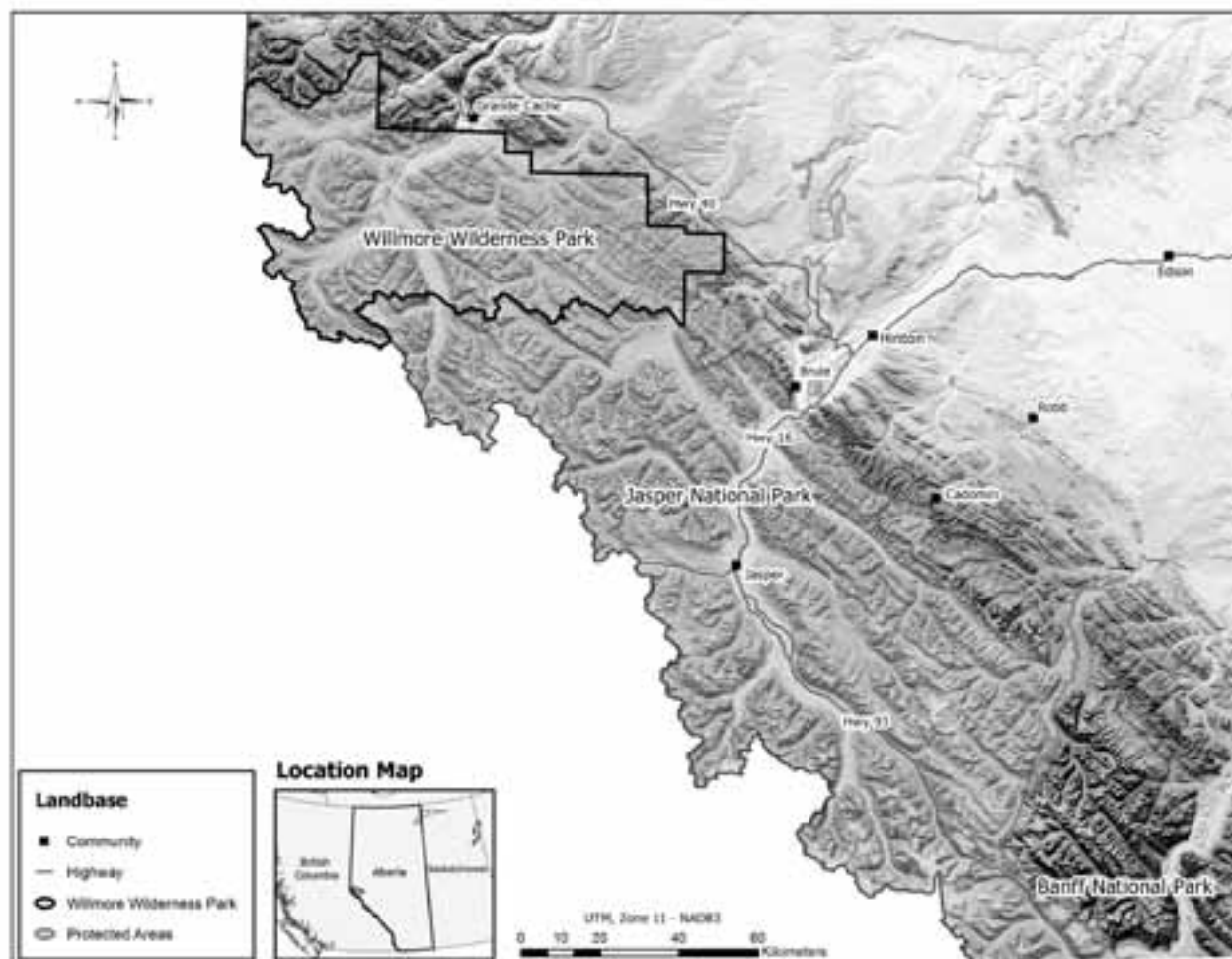


Figure 1. Study Area, Willmore Wilderness Park, Alberta, Canada

ble to integrate directly into a Willmore Park management plan. In addition, the use of emerging technologies, such as trail cameras and GPS for use in visitor monitoring, is a relatively new approach in Alberta's provincial parks. This project is an excellent opportunity to help understand the

utility of these emerging instruments and how they could be applied on a more provincial level to attain visitor characteristics and information.

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# On the use of geotagged photographs and GIS analysis for detecting travel patterns in protected areas

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## Introduction

Knowing the distribution and flows of visitors is essential to the management of protected areas. It enables park managers to assess use levels and eventually determine whether and where standards of quality are violated. The task is particularly challenging when the size of the protected area is considerably large and potential visitor routes are several. In such a case most traditional monitoring techniques (e.g. direct observation, mechanical counters), requiring extensive field work and personnel's effort, fall short of providing a reasonably cheap and immediate support (Cessford and Muhar, 2003). Simulation models, though powerful, call for complex computer programming and intensive data collection for model calibration (Cole and Daniel, 2003). Recently, the advent of the Web 2.0, enabling people to easily share digital material (e.g. photos, videos, GPS routes, etc.), has provided a new source of information about people's movements. In particular, geotagged photographs are georeferenced images that are uploaded on popular map-based websites (e.g. Flickr, Panoramio) by their authors. Considering that details like the name of the author and the date are attached to every image, it is possible to identify the most popular spots and track people's movements within a given area. Various authors (Girardin et al., 2008; Jankowski et al., 2010) have taken advantage of these features to detect popular locations and main tourist flows in highly visited regions and cities. However, their approach is not really informative in the case of natural area management because it simply quantifies visitor flows from one popular location to another without specifying which exact routes are followed. This study introduces a novel methodology combining the analysis of geotagged photographs for identifying popular destinations and GIS analysis for estimating visitor flows. The study was conducted on the recently established Dolomites Unesco Heritage site, in northeastern Italy.

## Method

In transportation planning, traffic volumes are commonly quantified by means of gravity models. These models rest on the assumption that traffic between two points is proportional to the amount of activity at each point and inversely proportional to the distance between them. The movement of visitors within a natural area generally follows this rule. People tend to move from some access points (e.g. village, trailhead, bus stop) to some destination points (e.g. natural attraction, campground, hut) and the volume of such movement is somehow proportional to the attractiveness of points, and inversely proportional to the distance between those (Figure 1). Distance in this case should not be strictly intended as a geographical measure, but rather as the "cost" in terms of fatigue, danger, chance of nice views, etc. for reaching the destination from the access point.

## *Identification of access and destination points*

Access points are places where people start their excursion: for a matter of simplicity these were identified as main roads and cable car stations. It was assumed that a destination point is one where the density of geotagged photographs is particularly high. A total of about 4000 photographs taken between June 1<sup>st</sup> and September 30<sup>th</sup> in the years 2000-2011 were analyzed and their location and data recorded in GIS raster format. Density was computed by applying a 300m x 300m moving filter, which assigned each cell the number of photographs taken within the filter on different days. Another filter (1000m x 1000m of size) was then applied on the density map to extract pixels of high density, representing destination points.

## *Gravity model*

The level of attractiveness was measured as the expected number of visitors and the number of photographs for access and destination points, respectively (Figure 1). In particular, the number of visitors was derived from the number of hotel beds in the surrounding of a given access point. The distance factor was assessed for each pixel as the travel time for going from the closest access point to the closest destination point (Figure 1). This was done by means of GIS weighted distance calculation functions. Constants of the gravity model were then estimated by considering actual numbers of visitors, as measured by mechanical counters at some locations across the study area.

## Results and discussion

The primary result of this analysis is a map reporting the expected level of crowding on each section of a path network. While numbers in the map do not reflect real numbers, they provide a detailed picture of expected visitor flows. This would enable park managers to quickly determine which parts of a natural area are overcrowded and therefore activate proper measures to redirect visitor flows so that standards of quality are met. The main advantage of the proposed methodology is related to its simplicity and minimal requirement of data from the field. Thus, it is highly suitable for large natural areas with extensive path networks, where on-the-ground data collection would be expensive and time-consuming. However, the method rests on various assumptions (e.g. visitor flows are determined on the basis of nearest access and destination points only), which make it particularly weak in case complex patterns occur in the real world (e.g. several popular destinations close to each other, multiple paths joining into one). A crucial issue in the analysis of geotagged photographs is related to the accuracy of the georeference. Very often, especially in the presence of popular landmarks (e.g. famous mountains), photographs are not located where they were actu-



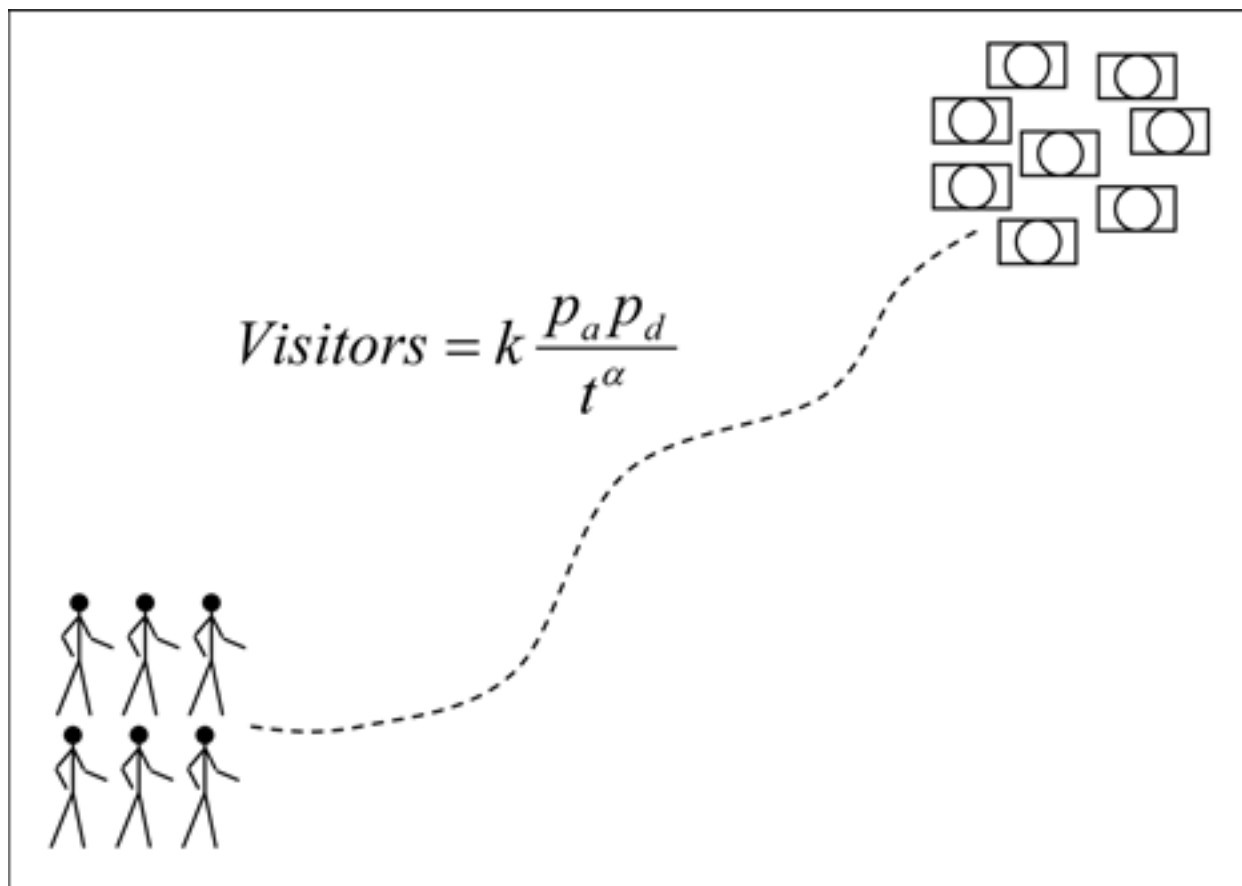


Figure 1. The number of visitors moving on a path is assumed to be proportional to the population at the starting point and the popularity of the destination point (as measured by density of geotagged photographs), and inversely proportional to the travel time between those points, by means of constants  $k$  and  $\alpha$ .

ally taken but where the portrayed subject is. The use of automatic photo downloading procedures in this case may overestimate the popularity of a place by counting also photographs that may have been taken kilometers away from the place itself.

Ultimately, the map obtained from this analysis provides relevant information about the opportunities for solitude offered by a given region. When combined with information on remoteness, disturbance and naturalness, it may support wilderness mapping of areas whose limited size (hundreds of square kilometers) implies that solitude opportunities are represented through actual people's travel patterns.

## Acknowledgements

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# “Night walks” and rural development: A Case Study of Alentejo, Portugal

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Alentejo is a large rural area in Portugal with the largest artificial lake in Europe, Alqueva. The lake has an area of 250 km<sup>2</sup> and extends through six municipalities: Barrancos, Moura, Mourão, Portel, Reguengos de Monsaraz and Alandroal (see Figure 1). In recent years the area has emphasized rural tourism and most recently invested in “astro-tourism” and was named the first “Starlight Tourism Destination” in the world.

According to Crouch (2001), terrestrial space tourism probably began with the movement of astronomical observers to different locations to better observe certain astronomical phenomena like eclipses and the movements of planets. But interest in preserving starlight as world heritage is very recent. The Starlight convention began in 2007 and Starlight Tourism destinations are an initiative of UNWTO with support of UNESCO and IAC. These destinations are accessible for tourists, but at the same time, they offer visitors high quality settings for the contemplation of the night sky and other the tourist activities based on this resource such as night horse ridings, night walks, night canoeing amongst other activities. According to Ros (2007) humanity must preserve the unpolluted night sky for future generations in order to:

- a) Enjoy the sky and feel emotional about it;
- b) Promote positive feelings towards astronomy and towards science in general;
- c) Help people discover and experience the excitement of gaining new knowledge by means of simple observations using the naked eye, binoculars, amateur telescopes or public observatories;
- d) Impress upon humanity the beauty of natural phenomena;
- e) Look at the sky to rediscover the stories of our ancestors.

The impact of starlight on humanity has been expressed in words of religion, art, literature, science, philosophy, business and travel. Alqueva offers several night time activities that offer a diverse tourism experience. One of these new products is the “night walk”. These walks take place around the surroundings of the lake and offer a different experience to visitors, including opportunities to observe the dark night sky, learn about celestial phenomena, fairy-tails, and local folklore related to the night, and to hear the sounds of the local fauna.

According to Morris (2011), human sensory orders are recalibrated when faced with the reduced illumination levels of the night; it is harder to judge depth and distance, details are obscured, colors muted, and one is obliged to compensate for this loss of visual acuity by drawing on the other senses. At night it is necessary to use peripheral vision because central vision is relatively weak in the dark when the lack of color cues and lighting makes cone cells far less useful. Rod cells, which are concentrated further away from the retina, operate better than cone cells in low light. This makes peripheral vision useful for seeing movement at night. This means that the same activity done during the night can lead to very different experiences. According to Clarke (2005) many tourists nowadays seek ‘doing’ activities in rural places. These activities are not directly connected with the local traditional culture but rather with what is possible to do. For example, ecotourism activities, adventure and sport tourism activities and some activities related to niche markets interested in space tourism based on land. At the same time, there are other, emerging tourism movements, like slow tourism, that enable the visitor to become part of the destination by interacting with the population and the physical geography at a pace appropriate to the retention of local culture and the place as a whole.

In this case study, we present a strategy based on the maximization of local hiking trails that can be used during the day or night reaching, thereby reaching different tourism segments and contributing to the occupancy rate of local rural lodging units and other tourism services. Walking trails in a context of developing rural and natural destinations represent a source of alternative income for the increasingly marginalized interior regions of Portugal. (Rodrigues, 2006).



Figure 1. Location of Alqueva

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# Internationalizing academic training in parks and protected area management through the EU's ERASMUS programme

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The management of natural resources and recreational activities in protected areas requires complex strategies and is an important issue for landscape and environmental planners worldwide. The areas concerned range from large, pristine wilderness areas to public park-like structures in urban areas. Conflicts are common wherever different land use activities occur in the same area. In order to successfully address these issues, planners need to acquire a profound knowledge of ecological and sociological methodological skills and the ability to work in multi- and interdisciplinary environments.

Students in the field of environmental planning and related disciplines are the future key players in this professional field. Thus, four European (Leibniz Universität Hannover, Universität für Bodenkultur, Wien, Mendel University, Brno and Wageningen University) and one U.S. university (West Virginia University, Morgantown) decided in 2011 to combine their efforts in internationalizing training in this field. The programme, conducted as a pilot course in 2011, is being funded under the EU's ERASMUS Intensive Programme (IP) scheme in 2012 and has taken place in Hannover and Harz National Park from July 23 to August 4, 2012. Overall, 30 students participated in this effort.

The objective of the course is to help students develop an understanding for the complexity of protected area management and for other disciplines than their own required to develop solutions for the most immanent challenges in this field. For the involved lecturers, the objective is to develop

and enhance teaching methods in a European (and transatlantic) context and to disseminate and publish the findings from the course. Topics covered are habitat management, wildlife conservation, recreational and visitor planning, environmental education, and human dimensions of ecosystem management.

Methods addressed and applied during the programme included ecological (e.g. habitat and species mapping and monitoring), geographical/digital (e.g. application of GIS, computer-based simulation) and sociological (e.g. visitor counts and surveys, conflict management) techniques and skills. Scientists and practitioners from all relevant disciplines, including Harz National Park managers, have contributed to the course.

Results of the course include the development of a joint learning platform with teaching materials on the topic of natural resource management and recreational planning in protected areas throughout Europe, and in the long run, the improvement of teaching methods based on the influence of European and transatlantic exchanges – exemplary integrated management plan for the study area. Overall, the programme intends to contribute to the advancement of protected area management in Europe and elsewhere.

The EU has already confirmed funding for 2013, so the course will be run again, then adding the University of Catania (Italy) to the list of partners.



# Trends in protected area management: Policies and the reality at national parks in Iceland and Japan

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New paradigms and philosophies have influenced international and national frameworks for protected area (PA) management over recent decades, with the role of PAs having evolved to the present situation (Fennell, 2003). Management objectives of many PAs describe their role as balancing the conservation with the need to derive economic benefits from use of the natural environment. Many changes in PA management strategy have aimed to balance both of these objectives. This study looks into the major streams of development of PA management on an international scale within the past 20 years, to follow up on developments since the 1992 Earth Summit, to understand how PA management can meet these two objectives successfully. We explore international regulations and agreements, and published literature on the current trends of PA management to identify good management procedures by comparing the 'theory' behind current PA management trends with, on a regional scale, the 'reality' of actual PA management in two national parks (NPs).

The literature review used published articles within the field of PA management, and international conventions on sustainability, conservation, and public participation, as well as regulations on PA management to identify best practices and public participation (theory) of PA management. For the case studies (practice), two sites were selected according to their similarity in environmental factors, use, and management challenges. The case sites are: the Vatnajökull NP in Iceland and Daisetsuzan NP in Hokkaido, Japan (see Figure 1). We analyzed the Act on the Vatnajökull National Park (no. 60 of March 28, 2007) in Iceland and the Japanese Natural Park Act (no. 47 of June 3, 2009) which are intended to describe the NP governing body, the involvement of stakeholders in the decision-making process, define the zoning of the NP area for different uses, and specify regulations for the use of resources and management. We examined the extent to which the management philosophies and procedures described are integrated into the reality of the management of the NPs.

The results show a considerable change in the PA management paradigm over the last two decades, with a clear trend from a 'closed' towards an 'integrative' management approach (Fennell, 2003). The establishment of sustainable management systems with regards to tourism builds on the cooperation of many players. Currently, policy makers and the public alike acknowledge that a successful PA management strategy has to be based on the collaboration of stakeholders. In PA management policies, including stakeholders in the decision-making of PA management has been the most prominent development, and has been described as part of modern PA management (Phillips, 2003). The main challenge of integrating the public in the deci-

sion making process remains. Politicians and conservation spokespersons continue to pay "lip-service" to the need for public participation, whilst arguing for it in international agreements by the UN or IUCN. While international institutions are important, they are not without criticism, both from the public and scholars (c.f. Chapin, 2004). They cannot be seen as the only solution to environmental degradation, and strengthening environmental policy will rely on the support of national governments and individual institutions, the participation of the public, and the accountability of PA institutions to stakeholders. However, the involvement of outside organizations is also dangerous, since their interests can dominate those of local stakeholders (ibid). Therefore the need for participatory management has to be rooted in the understanding that sustainable PA management needs a robust decision-making process which is based on the capability for collaboration of all those involved. Participatory management processes are believed to be able to achieve robust decision-making and call for an interdisciplinary and multi-level view (Berkes, 2007). Such view is, however, difficult to achieve. An integrative process has to build upon the consensus among different stakeholders and the willingness to implement majority decision which can conflict with long term goals. Limits of Acceptable Change (LAC), as a participatory management process, is seen as one tool to achieve a common understanding of the management situation and to reach consensus, while allowing for the participation of diverse stakeholder groups. LAC is seen critical to achieve the goal of balancing the interests of stakeholders and empower different contributors (McCool and Cole, 1997).

In both case sites, the actual management of the PA seems not to match the standards set by the international agreements and suggested best practice identified in the scholarly literature, and integration of stakeholders into all levels of decision-making processes is lacking. While PA management integrates stakeholders into the decision-making in some form, this takes place at different levels and to different extents. The documents do not define the selection process of board members, and leave the accountability towards the public unclear. Accountability of selected stakeholders and their decision-making practices are important when it comes to the question of good governance and trust by the affected stakeholders. However, reading the documents from the case studies, it still appears 'natural' that the management of government-funded conservation institutions, such as NPs, lies in the hands of selected public representatives.

A previous study revealed that PA management in Iceland and Japan has more similarities with regards to stakeholder opinion and conflict management than expected

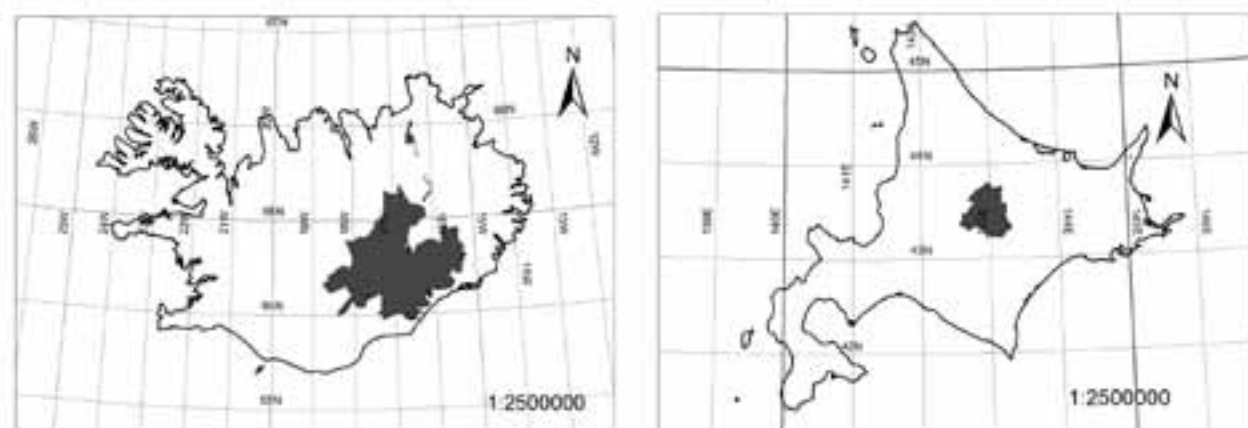


Figure 1. Location of the sites (in dark grey): (a) Iceland – Vatnajökull NP, (b) Hokkaido – Daisetsuzan NP

(Schaller, 2011). This similarity suggests that PA management, although examined in different cultures, is, in general terms, similar, beyond national borders. Hence, we believe that not only do the two case sites have to deal with the same problem of trying to increase participation, but they lack the means of execution. We suggest that participatory management methods, such as LAC, would solve this problem. It would enable PA managers to reach out to stakeholders, integrate them into the decision-making process, and thus enact participation rights as promised by international agreements and regulations, as well as promote sound management decisions and sustainability.

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# Understanding the recreational horseback riding experience: Motivations, conflict and response to conflict

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Recreational horseback riding is a significant and growing form of outdoor recreation both in the U.S. and Europe. Of the nearly 124,000 million miles of horse and pack stock trails in the U.S., 85% are managed at the federal level and 78% in 'natural settings' (AHC 2005). While 9 percent of the U.S. population aged 16 and older participates in horseback riding, the projected percentage growth is between 44 to 86 percent by 2060 (Cordell 2012). Given the size and potential growth of this recreational activity, attending to and understanding the horseback trail experience is important. However, despite increasing participation, little is known about recreational horseback trail riding. Thus, motivations for recreational experiences and conflicts within that experience were examined among riders in one U.S. state.

A random sample of 804 residents in one U.S. state who purchased a state horse trail pass received an eight page mail questionnaire and 60% responded. The questionnaire was developed based on previous research and included a variety of sections, including those on motivations and on conflict experiences. Specifically, respondents identified 1) the importance of 20 motivations, based on Driver's (1977) classic recreational experience preferences, and 2) how often they experienced twelve potential sources of conflict (Schneider 2000; Carothers et al. 2001). If respondents experienced conflict and if it interfered with the experience, the respondents were then asked additional questions regarding its source and how they responded to the conflict.

Mirroring national and international statistics, the majority of horseback trail riders were female, between the ages of 41-50 (55%), and white, non-Hispanic (90%). Of the 20 possible motivations provided for horseback riding, seven were important or very important to more than 75% of respondents, including to view scenery, be close to nature, get away from the usual demands of life, experience nature, explore and discover new things, relax physically, and be physically active. Conflict experiences among the majority of respondents included hearing others on the trail, litter, and evidence of off trail use. More than one-third indicated access was an issue. In response to the conflict, nearly half of the respondents talked to other members of their group about the incident and followed established rules of etiquette. Less than one-quarter of respondents cited they were displaced by the conflict.

The emphasis on the motivation to view scenery highlights the importance of visual resource management for all visitor types and eye levels. Considering the viewshed for users both walking and those elevated on horseback increases its importance with multiple-use trails. One potentially unexpected finding is that of the importance of physical activity as a motivation for the trail riders: nearly four

of five riders indicated physical activity was an important reason to ride. In the U.S., a 2002 Presidential Executive Order mandated federal land agencies promote the use of recreation for improved health (Exec. Order No. 13266) and a 2011 assessment of physical activity on forest lands has occurred (Kline et al. 2011). Both riders and managers can pay attention to this health benefit and seek resources to support it accordingly.

Half of the recreational horseback trail riders identified a conflict that interfered with their experience and indicated that it was stressful. Compared to other types of trail visitors, the reported conflict incidence and stress level is high for horseback trail riders (Schneider et al. 2009). While litter and off trail uses commonly incite conflict among recreationists, particularly unique among horseback riders was the frequency of hearing others on the trail. As such, enhancing awareness of the importance of quiet, as outlined in the Leave No Trace principles (<http://lnt.org/learn/7-principles>), and providing detailed actions how to maintain that quiet may be essential to protect and enhance horseback trail riding experiences, among other recreational experiences.

In response to conflict, one in four respondents indicated they moved within an area and planned to avoid the area during their next trip, and one in five were displaced by leaving the area altogether. Determining if the number of respondents displaced is acceptable is a management decision. Certainly adding the level of conflict and response to conflict to existing Limits of Acceptable Change processes is one management approach. Understanding visitors plan to avoid areas perhaps puts into new light the type and amount of information that can be shared about trail use. For example, providing information about regional riding opportunities can both disperse use and inform readers about alternative site choices.

This project brought forth data from one particular state to expand the limited information that currently exists about recreational horseback trail riders. Results indicate that opportunities to successfully manage for the recreational horseback trail rider include planning and developing trails with attention to viewsheds and soundscapes, providing timely and targeted educational messaging regarding the importance of trail etiquette, providing regional riding opportunities, as well as identifying and documenting physical activity as part of the experience.



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# How do children experience nature? Meaning-making and socialization to outdoor life

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The outdoor life of children has changed substantially during recent decades both in form and content. In Norway, it is suggested that children spend less time outside in nature areas than before, but there is a lack of scientific evidence support this assumption. Existing studies also show divergent results on how much time Norwegian children spend outdoors. This poster presents a research project financed by the Norwegian Research Council in the period of 2012 to 2015.

Until some decades ago, the outdoor life of children could be characterized as a natural part of the everyday life of childhood, as a part of transport, work, duties, play and social life. Today, the outdoor life of Norwegian children seems to be much more about outdoor *activities*, planned and organized by adults and with adults present (Skår and Krogh, 2009). Spontaneous play outside competes strongly with organized activities in leisure time, and even stronger with indoor digital services. The fact that children spend increasing time in institutions (school, pre- and post school programs and ECEC's), also contribute to less 'free time' without adults present. In total, today's outdoor life of children deals increasingly about what parents and other adults define it to be.

The changes and characteristic of children's outdoor life briefly described above, does not imply that no children spend time outside in spontaneous play without adults present. A qualitative study (Fasting, 2012) describe how children have their own places outside; mostly places in nature, and that they know these places from regular activity and play. However, there is generally very little knowledge about who, when, where and in what contexts Norwegian children spend time outdoors in nature areas, and this study aims to fill this knowledge gap by a literature review and by performing a national, quantitative survey among parents.

Material and social framework in different ways stimulate the creative activity of children, and relevant to this study is research focusing on how children's own culture could be understood (James et al., 1999). Hart (1997) focuses on how play outside as part of the culture of childhood is gone, and that the everyday life of children has shifted to be carried out indoors. An important quality and characteristic of nature is the way it facilitates the opportunity for children to explore and create their own play spaces as a sense of places that belongs to them (Chawla, 1992; Jones, 2000). Derr (2006) shows that outward exploration, freedom and room for trial and error are vital for the development of creativity, social development and the development of independence and identity. Some authors have explored the consequences of children's increasing participation in organized and plan-

ned activities, but limited research has been undertaken on the significance and impact of a planned and organized everyday life in relation to children's nature experiences (Skår and Krogh 2009). The main focus in the study will be on meaning-making in different outdoor activities, by focusing on how children experience nature in different settings along a gradient from more self-controlled and unorganized outdoor activities to more adult-controlled and organized outdoor activities. This main part of the study will base on three in-depth qualitative case-studies and two more superficial examples which in total represent this gradient.

## Primary and secondary objectives

1. Provide a comprehensive and multidisciplinary description of how children experience nature.
2. Increase the understanding of the social and cultural conditions that affect children's outdoor activities, and how this may affect meaning-making and socialization to outdoor recreation.
3. Provide knowledge about the contexts in which children spend time in nature today: what characterizes the different arenas in which children participate in outdoor activities, and how do the adults and children who participate in these activities experience the different settings?
4. Acquire applicable knowledge for society about the content and meaning-making of children's experiences in nature, which may facilitate suitable opportunities for future outdoor recreation.

## The four main parts of the study

### 1. Literature review

The literature review will describe existing knowledge about how children use nature today, emphasizing the Norwegian situation.

### 2. National survey

A national survey among adults with children between 0 and 12 years of age will be accomplished. The study will map when, who, where and in what contexts children spend time in nature.

### 3. Qualitative case study

Three to five qualitative case-studies will focus on how the presence of adults, the nature environment and other framework conditions are mirrored in children's nature experiences. Methods are participating observation, focus groups and interviews with children and adults.

#### 4. *International co-operation*

Forestry Commission, UK will contribute in the study by arrangement of a study tour and comparison of findings from this study with experiences from UK.

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# Quantification of the physical activity and physiological constants during hiking in peri-urban recreational areas of Vienna

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## Introduction

In the last years, the quantification of physiological parameters during hiking activities has gained increased interest (Saunders et al. 2008). In this communication, we report how the combination of Global Positioning System (GPS), heart rate variability (HRV) and the use of accelerometers leads to a comprehensive description of the hiking activity.

## Materials and methods

This work is a pilot study that combines descriptive and quantitative aspects of heterogeneous hiking routes located in peri-urban recreational areas of the City of Vienna, Austria. The main characteristics of the selected routes (distance – km; increase/lose of elevation – m; maximum slope – %; mean slope – %): route 1 (8.2; 353/-349; 22.7; 7.9), route 2 (8.1; 70.4/-71.2; 7.1; 1.6), route 3 (5.4; 411/-409; 50.4; 14.1), route 4 (4.4; 162/-163; 48.7; 7.2).

Four healthy subjects did the hiking routes in alternated days. All of them wore smart t-shirts (Nuubo, Valencia, Spain) equipped with sensors that registered the electrocardiogram, the acceleration in the three axes and the geolocation of the subject as a function of time. The electrocardiography data were processed using the software provided by Nuubo. An analysis of the QRS complex was carried out. The derived parameters of the Heart Rate Variability (HRV) were calculated utilizing the software Kubios HRV (version 2.0, Biosignal Analysis and Medical Imaging Group, Kuopio, Finland). The statistic parameter selected for HRV characterization was pNN50; this parameter expressed the percentage of consecutive RR intervals (i.e. beat-to-beat interval) which at least differ in 50 milliseconds. The energetic consume was obtained using a software developed at the Matlab 2010a interface (Mathworks Inc, Natick, USA). The acceleration of the three axis was used as input and the used equation was:  $METS = 0.668876 + 0.000863 * counts$  (Sasaki et al. 2011). The data concerning the geolocation were visualized by Google Earth. The spatial data were expressed by means of the median (range). Due to the small sample number (n=4) non-parametric test were carried out to establish the differences between the variety of routes. In particular, we used the Friedman test. In the cases of significant values we used the T of Wilcoxon to determine such differences. The error was  $\alpha < 0.05$ .

## Results

The visual QRS analysis, peak distance of the electrocardiogram signals, did not show any anomalous behavior. Table 1 shows the median of the heart rate per minute (HR) and the pNN50 of the four subjects. The energetic loss can also be observed in Table 1. In particular, the loss for the second route was lower. The mean walking parameter did not show significant differences.

## Discussion

Our results show that the route with the smallest slope (route 2) requires less physical effort than the rest of the routes. The slope of the routes is an important factor affecting physical effort (Terrier et al. 2001). Usual route descriptions in recreational areas include information about the distance and the approximate duration that the subject will need to walk along the route. However, we would like to show in this study that routes can be also described with physiological data (e.g. energy consumption). This type of data delivers important information to visitors of outdoor leisure settings. In this way a visitor would be able to chose the hiking path that suits his/her physical capacities as well as his/her leisure preferences.

The main limitation of this type of study is the sample size. In future work, such investigation should be carried out considering the age of the subjects and the physical constitution among other variables.

## Conclusion

The physiological parameters considered in this pilot study are sensitive enough to distinguish the physical work caused to the subject by the hiking route. The implementation with physiological parameters of the description of the hiking routes could have interesting implications for the health of the subjects who want to enjoy the natural environment. In addition, a more complete description of the hiking route would increase by itself the tourist value of such recreational area.

Table 1. Physiological and kinetic parameters for each route

	Mean HR (beats/min)	pNN50 (%)	Metabolic Index (METS)	Mean Walking Speed (km/h)
Route 1	100.7(38.7)	26.9(34.61)	5.4(0.8)	3.5(2.1)
Route 2	98.9(30.1) <sup>a</sup>	27.7(27.9)	4.6(0.6) <sup>b</sup>	4.8(1.3)
Route 3	102.1(41.3)	43.6(43.5)	5.5(0.9)	4.9(0.3)
Route 4	106.3(37.7)	26.9(25.7)	5.9(0.9)	5.8(1.1)

*The data are expressed in median (range). HR: beats per minute; pNN50: percentage of consecutive RR intervals that differ in more than 50 milliseconds; METS: equivalent metabolic. <sup>a</sup>indicates differences between route 2 and route 1, and between route 2 and route 4 ( $p < 0.05$ ). <sup>b</sup> indicates differences between route 2 and the other ones (1, 3 and 4),  $p < 0.05$ .*

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# Differences in environmental attitudes between Russia and Japan

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## Introduction

Thoughts for natural environments should be decided by many factors. Therefore, knowing what residents in other countries think about the natural environment can be very useful for understanding each other's countries comprehensively. However, it seems to be rare that studies discussed and arranged about the causes from a quantitative point of view, which would bring the commonalities or differences, after having clarified commonalities and differences in way of thinking. Within this context, we conducted several experiments to investigate Japanese and Russian attitudes toward the natural environment. The purpose of this study was to clarify the commonalities and differences in environmental attitudes between residents of the two countries at specific research sites. We then discuss potential causes for these commonalities and differences through comparing data from both countries.

## Method

### Research sites and respondents

For a cross regional and cultural investigation between the two countries, we chose Moscow State University (in European Russia), Irkutsk University (in central Russia), and Kamchatka University (in eastern Russia) as the Russian research sites; we chose Hokkaido University (in northern Japan), Chiba University (in central east Japan), Kyoto Prefectural University (in central west Japan), and Minami-Kyushu University (in southern Japan) as the Japanese research sites. Members of the author group and the staff at each university conducted these experiments at each site.

### Questionnaires

We prepared three questionnaires: 1) New Environmental Paradigm (NEP) (Dunlap, R.E. et al., 1978), 2) Thompson and Barton Scale Test (TBS) (Thompson, S.C.G. et al., 1994), and 3) Attribute questionnaire. NEP consists of 12 questions (based on a seven-point Likert scale) intended to measure an "ecocentric system of beliefs" as opposed to an anthropocentric system of beliefs, and is the most widely used measure of investigating environmental issues. TBS consists of 25 questions (also based on a seven-point Likert scale) intended to explore environmental attitude from two possible directions – principles (ecocentrism and anthropocentrism) and concern (environmental apathy). "Ecocentrism" refers to the degree to which one tends to regard the ecosystem and natural environment, while "anthropocentrism" refers to the degree to which one tends to think about human life. These two indicators are not mutually exclusive, but coexist. And to determine the degree of in-

terest, "environmental apathy" was used as an indicator of indifference to the natural environment. We asked all respondents to answer the attribute questionnaire first (table 1), and then complete the other two questionnaires.

## Results

### Comparison between the two countries

Table 1 lists the results from the data analysis (except those obtained by ANOVA and multiple comparisons), and key findings are summarized below.

NEP: No significant difference was found between the two countries through an analysis of variance (ANOVA). Respondents in both countries apparently have similar ecocentric systems of beliefs (as measured by NEP).

TBS: Ecocentric values were reasonably high in both countries. A statistical comparison (ANOVA) showed that Russia had significantly ( $p < 0.01$ ) higher ecocentrism than Japan. As for anthropocentrism, Japan had anthropocentric values that approached the level of "indifference," while Russia had much lower anthropocentric values. A statistical test conducted as part of ANOVA showed that Russia had significantly lower anthropocentrism than Japan ( $p < 0.01$ ). In terms of environmental apathy, the results showed that environmental apathy was absolutely lower than the level of "indifference" in both countries (meaning that the respondents in both countries had a strong interest in the environment). ANOVA also revealed that Russia had significantly lower ( $p < 0.01$ ) environmental apathy than Japan.

### Comparison between each research site

NEP: No significant difference could be found among the seven sites. TBS: We compared each research site in terms of ecocentric values obtained by ANOVA and multiple comparisons (Tukey-Kramer), and found the following significant differences: Moscow–Chiba ( $p < 0.05$ ) and Minami-Kyushu ( $p < 0.05$ ); Irkutsk–Kamchatka ( $p < 0.05$ ) and all Japanese sites except Kyoto ( $p < 0.01$  to  $p < 0.05$ ). As for anthropocentric values, we found the following significant differences: Moscow–Chiba and Kyoto, Minami-Kyushu ( $p < 0.01$  to  $p < 0.05$ ); Chiba–Irkutsk ( $p < 0.05$ ) and Kamchatka ( $p < 0.05$ ). In terms of environmental apathy, the following differences were significant: Moscow–Chiba ( $p < 0.01$ ) and Minami-Kyushu ( $p < 0.05$ ); Irkutsk–Chiba ( $p < 0.01$ ) and Minami-Kyushu ( $p < 0.05$ ). We also confirmed that there were significant differences between both countries in terms of ecocentrism, anthropocentrism, and environmental apathy, and that the sites in Russia tended to be higher in ecocentrism but lower in anthropocentrism and environmental apathy than at the sites in Japan. revealing

the same results as in the comparison between both countries.

**Factors making a difference between the two countries**

In considering the factors that could influence the four indexes (i.e. ecocentric system of beliefs, ecocentrism, anthropocentrism, environmental apathy), we conducted multiple regression analysis (using a step-wise method where we selected attribute data as independent variables and the four indexes as dependent variables). As a result, the ecocentric system of beliefs in Russia was influenced by sex; ecocentrism was influenced by age and sex; anthropocentrism was influenced by the number of overseas travels, and environmental apathy was significantly influenced by sex ( $p < 0.01$  to  $p < 0.05$ ). In Japan, the ecocentric system of beliefs was influenced by the level of urbanization of a respondents' current residence along with the type of landscape at previous and current residences; anthropocentrism was influenced by the level of urbanization in previous residences; environmental apathy was influenced by the type of landscape at current residences along with the experienced type and number of overseas travels ( $p < 0.01$  to  $p < 0.05$ ).

**Discussion**

These findings suggest the following: 1) Russian respondents were more ecocentric than Japanese respondents, 2) Russian respondents were less anthropocentric than Japanese respondents, 3) Russian respondents had lower levels of environmental apathy than Japanese respondents, and 4) different factors influence the four indexes in each country. These results suggest that Russian respondents (especially women and the elderly) are highly interested in the natu-

Table 1. Respondents' attributes and the results of analysis

Attribute	Chosen independent variables (standardized partial correlation)	Category	Russia		Russia			Hokkaido		Japan		Miyazaki (M)
			Moscow (M)	Hokkaido (H)	Kamohoh (K)	Hokkaido (H)	Chiba (C)	Kyoto (K)	Miyazaki (M)			
			n=115	n=171	n=20	n=22	n=40	n=40	n=23	n=27	n=1	
Sex	SEX (0.156) SEXAD (0.48) SEXED (0.38)	Male Female	54 67	111 64	17 3	12 20	25 15	27 13	20 24	17 10	44 7	
Age	AGE (0.206)	Average	21.4 52 21.24±0.27 26.54±3.30 21.2	21.6 55 112 3 1	21.5 14 23 2 0	21.7 15 23 4 1	21.0 23 14 3 0	22.3 3 43 2 0	22.3 9 43 1 0	21.3 9 18 0 0	20.7 34 18 0 0	
Type of education		High school University Graduate university Others	79 15 18 9	127 43 9 1	35 3 6 0	13 12 7 0	35 0 5 0	29 11 9 0	33 20 5 0	11 12 0 0	50 5 8 0	
Academy		Technical Natural sciences Humanities Others	8 88 54 3	5 148 8 10	2 28 7 2	3 21 7 1	1 38 0 0	0 40 0 0	0 48 5 0	0 16 1 0	0 44 2 0	
Occupation		Student In-site worker Out-site worker Teacher Others	89 1 30 1 0	170 0 9 0 0	33 1 8 0 0	22 0 10 0 0	25 0 4 1 0	40 0 0 0 0	53 0 0 0 0	27 0 0 0 0	67 0 0 0 0	
Level of Urbanization of Residences (in the past)	URB (0.189)	City center	23	16	14	8	11	9	4	1	8	
		Residential area	44	86	18	13	13	20	30	14	22	
		Suburb	11	30	0	0	4	8	6	4	12	
		Rural area	27	30	7	0	12	8	13	6	13	
Level of Urbanization of Residences (at present)	URB (0.181)	City center	30	56	11	4	15	24	8	8	1	
		Residential area	86	86	34	34	18	15	30	21	21	
		Suburb	9	23	3	2	4	1	5	0	10	
		Rural area	8	15	1	2	3	8	5	1	15	
Landscape type of Residences (in the past)	LSC (0.177)	Field	81	114	27	26	18	23	42	18	23	
		Mountainous	22	50	1	3	15	15	12	1	15	
		Sea coast	6	6	1	1	4	2	1	0	5	
		Other	7	11	0	3	0	0	0	1	0	
Landscape type of Residences (at present)	LSC (0.181) LSC (0.22)	Field	77	181	26	26	15	36	52	28	38	
		Mountainous	25	11	0	2	23	4	1	1	5	
		Sea coast	8	8	2	2	6	0	0	0	8	
		Other (other)	1	1	0	0	1	0	0	1	0	
The average of one's years of experience as traveling	TRAVEL (0.224) TRAVEL (0.283)	The experience of visiting the other country (Year)		0	6	0	0	0	2	2	0	7
		The experience of visiting the other country (Month)		111	161	20	22	40	38	51	27	45
		The experience of visiting Siberia (Year)		30	0	12	11	7	0	0	0	0
		The experience of visiting Siberia (Month)		61	111	27	21	22	40	53	27	91
		The experience of visiting abroad countries and areas		62	84	26	17	16	23	28	15	16
		The experience of visiting abroad countries and areas (Month)		46	87	13	15	21	17	25	12	33
Ecocentric system of beliefs (NEP)	NEP (0.224) NEP (0.283)	The number of visiting abroad countries and sites (average)		1.06	0.84	1.39	0.75	0.80	1.15	0.91	0.89	0.49
		0		49	87	12	15	21	17	25	12	33
		1-2		46	70	16	15	17	18	22	14	15
		3-4		12	12	8	2	3	4	5	1	7
		5-7		2	7	2	0	0	1	1	0	0
Ecocentrism (TBS)	TBS	Ave	5.50	5.51	5.58	5.75	5.27	5.42	5.55	5.42	5.62	
		S.D.	0.72	0.61	0.64	0.65	0.78	0.63	0.54	0.54	0.68	
Anthropocentrism (TBS)	TBS	Ave	5.71	5.21	5.70	5.97	5.44	5.24	5.32	5.40	5.28	
		S.D.	0.79	0.75	0.71	0.82	0.94	0.75	0.62	0.60	0.70	
Environmental Apathy (TBS)	TBS	Ave	3.59	4.07	3.42	3.64	3.70	3.96	4.21	4.06	4.11	
		S.D.	0.89	0.65	0.67	0.69	1.13	0.77	0.71	0.54	0.61	
Environmental Apathy (TBS)	TBS	Ave	2.61	3.08	2.45	2.44	2.89	2.89	3.23	2.96	3.11	
		S.D.	1.00	0.80	1.00	0.79	1.04	0.89	0.88	0.84	0.89	

The result of multiple regression analysis in Russia:  $R^2 = 0.01$ ,  $p < 0.05$ . Japan:  $R^2 = 0.01$ ,  $p < 0.05$ . ECO: ecocentric, ANT: anthropocentrism, EA: environmental apathy, EEO: ecocentric system of beliefs. Statistical analysis method:  $\chi^2$  test. \*\*  $p < 0.01$ , \*  $p < 0.05$ .

ral environment and attempt to adjust their own lives to the natural environment more than Japanese respondents. Thus, Russian respondents were more highly orientated toward human and environmental symbiosis than Japanese respondents. It was also interesting that there was no statistically significant difference in any indicator of environmental attitude in the domestic comparison, such as Moscow – Irkutsk and Hokkaido – Chiba. In others words, these study findings suggest that there may be specific cultural factors that are stronger between respondents from different nationalities compared to the strength of such factors among respondents from the same nationality.

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Thompson, S.C.G., Barton, M.A. (1994). Ecocentric and anthropocentric attitudes toward the environment, Journal of Environmental Psychology, 14: 149–157

# An overview of outdoor learning in Estonia

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Outdoor learning is learning in a natural environment, using all our senses, making things by hands and sharing our knowledge with others (Sarv, 2006). Outdoor learning can be held in school yards and nearby parks/forests, but also at environmental education/nature centres and protected areas. Important is that learning outdoors through personal experiences help to develop children's affective relationships to the natural environment, their environmental sensitivity and outdoor behaviour, as well as their social relationships (Palmberg, Kuru; 2000). Since humans impact on our planet grows faster than concerns about our environment it is necessary to focus on educating environmentally literate citizens. One alternative is to begin from the grassroot level – to add and integrate environmental education into the national curriculum for kindergartens and elementary schools. By these actions children can take part in different environmental education programs (field trips, camps, adventure activities). The purpose of these outdoor activities is to give pupils out-of-classroom educational experiences involving direct contact with various environments (Palmberg, Kuru; 2000). The aim of this paper is to give an overview of the importance of outdoor learning, how it is held and managed in Estonia.

The term 'outdoor learning' has been used in Estonia for about 8 years, but essentially it has been practised much longer. Already at the beginning of the 20<sup>th</sup> century activity-based learning was introduced to teachers and written to curriculum. It helped to promote school gardens, conduct nature-based excursions and establish school forest districts. At the end of the century, over 85 schools in Estonia had its own forest to manage. Unfortunately in the 1990's school forests were eliminated due to reformations in forestry and privatization of the forest land.

According to Estonian national curriculum for elementary schools, every pupil must have an opportunity to attend at least once a year to some sort of outdoor learning activity (visit a museum or an exhibition, take a field trip to the nature or an excursion to nature centre, attend an environmental education program, etc). Overall Estonia there are about 80 different institutions that offer outdoor learning experience for children from kindergarten to gymnasium. Among them, there are small locally acting NGOs, national museums, botanical cardens, zoos/animal parks and different companies. Two of the biggest institutions that offer environmental education in every county are The State Forest Management Centre (RMK) and Environmental Board. RMK has 17 nature centres overall Estonia that offer different environmental education programs for schools and kindergartens. They also organize exhibitions, workshops and theme days. The Environmental Board has

developed different programs, which are held in local nature protection areas and also at schools/kindergartens.

Since the beginning of 2012 a research about outdoor learning is taken place in four counties in Estonia – Harjuma, Tartumaa, Ida-Virumaa and Pärnumaa. There are also one of the biggest cities – the capital city Tallinn, second biggest Tartu, third Narva, fourth Pärnu and fifth Kohtla-Järve. The purpose of the study is to gather information about how many schools from the cities mentioned above participate environmental education programs offered by different institutions. After that a survey will be held in the most active and inactive schools to study the purposes of participation, reasons for not attending programs, differences of environmental knowledge and attitudes toward nature.

In Harju county there are 11 different institutions that offer environmental education; five of them (Nõmme Nature House, Muraste Nature School, RMK Viimsi and Aegviidu Nature Centres, Environmental Board Environmental Education Department of Harju County) charge no fee from participation. Lists of participants from year 2009-2011 were gathered and analysed from all five institutions gathered above. Exemption was made with Environmental Board, whom lists are from 2010-2011 (the Board was established in February 2009). Only schools from Tallinn were taken into account. Altogether there are 81 schools in Tallinn (municipal, private, russian, english and finnish schools). First results from Harju county are shown in a following table (Table 1).

According to the table above within 3 years RMK Aegviidu centre was visited by approximately 26 % of the schools in Tallinn. RMK Viimsi centre was visited by 33 %, Muraste nature school 27 %, Nõmme nature house 25 % and Environmental Board by 12 % of the schools in Tallinn. Total number of schools visiting different environmental institutions were 42 in 2009 (52 %), 49 (60 %) in 2010 and 57 (70 %) in 2011. Differences between the numbers in the table and above are because many schools visited 2 or more institutions in a year.

First results of the study show that despite the different opportunities, there are schools in Tallinn that do not visit any of the environmental education institution in a year. Although the number of these schools decrease every year (from 48 % in 2009 to 30 % in 2011). The next step is to contact the most 'active' and 'inactive' schools in Tallinn and conduct surveys to find the reasons for not participating programs and differences between the environmental knowledge of the pupils from active/inactive schools.



Table 1. No of schools in Tallinn visiting environmental institutions in Harju county.

<b>Institution/year</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
RMK Aegviidu	20	17	25
RMK Viimsi	20	24	37
Muraste	15	24	21
Nõmme	22	27	10
Environmental Board	-	9	11

# The definition of visitor product in Special Nature Reserve “Obedska bara”

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The Special Nature Reserve “Obedska bara”, located near the river Sava, is the oldest protected area in Serbia. Its protection has started in the second half of the 18<sup>th</sup> century, during the Austro-Hungarian Empire, when it was a protected hunting area. Since 1994, Serbia has designated “Obedska bara” the special nature reserve, the first protection category of exceptional significance for Republic of Serbia. This protected area covers 9.820 ha and the protection regime consists of the strict regime on 3,2 %, limited regime on 26,1% and sustainable development regime with allowed use of forest resources on 70,7% (the wise use). The Special Nature Reserve “Obedska bara” obtained its international status: Ramsar site since 1977, Important Bird Area since 1989 and Important Plant Area since 2005. The activities on restoration of wetland ecosystems started upon designation.

The situation in Serbia has been quite hard during the past decades and it has influenced the visits to Serbian protected areas, including “Obedska bara”. A few excursions per year and some anglers did not satisfy the needs and plans the reserve’s manager Public Enterprise “Vojvodinašume”. In the past three years, a lot of work has been done by the Public Enterprise “Vojvodinašume”, supported by the Provincial Secretariat of Urbanism, Building and Environmental protection in a bigger extent, and by Ministry of Environment, Mining and Spatial Planning in a smaller extent. The idea was to arrange the area of “Obedska bara” and several projects have been implemented by the reserve’s manager in the last three years, including;

## Activities on restoration

- Revitalization of wetlands on 300 ha every year – chopping down the ground vegetation mechanically
- Building one bird island
- Building two elliptical water bodies and widening later the two water bodies for 6 m, and deepening for 1 m
- Cleaning of waste
- Cleaning on 6 micro locations
- Cleaning and spreading the main canal linking the bank with the “Obreško okno” pond

- Cleaning other canals of sludge and mud in 3.000 m
- Cleaning canal “Jasenska-Belilo” from sludge and mud in the length of 1.000 m
- Restoration of the park “Obedska bara” in a small replica of the Special Nature Reserve “Obedska bara” (cutting old trees and planting new 58 ones, setting the path in the length of 800 m, wooden fence in the length of 150 m, the entrance gate, building 14 fireboxes, 16 tables, 32 benches, 10 baskets, info board etc.)

## Activities on infrastructure

- Building the educational center
- Building four watchtowers for monitoring
- Building two wooden bridges (50 m and 15 m length)
- Building and marking the educational path in 7 km length
- Building (cleaning of bushes and branches) and marking the walking path in 6 km length

## Activities on equipment

- Building three educational points (eaves, tables, benches, info tables etc.)
- Purchase a tourist boat (catamaran) and two out-board motors
- Purchase of two motor cleaners
- Purchase of 16 wooden boats
- Printing 2.500 educational tourist maps

As a result of these efforts, the visitors have come back to the protected areas generally, and in case of the Special Nature Reserve “Obedska bara”, it meant 12.000 visitors in the last year. Furthermore, the bird populations have tripled in Obedska bara, e.g. colony has increased from 3 species to 7 and number of pairs in colony from 250 to 750. If our expectations are fulfilled, we will have more visitors in the future and better conditions for protecting biodiversity in “Obedska bara”.



Figure 1. The watchtower "Kula Obeda"

# Incorporating the 7 Summits transcontinental project into the curricula of higher education institutions in Kazakhstan

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## Introduction

In 2010, the State Program for Accelerated Industrial and Innovative Development for 2010-2014<sup>1</sup> was introduced by the government of Kazakhstan. The program aims to promote development within the oil and gas sector, mining and metallurgy, the nuclear and chemical industries, engineering, the construction industry, pharmaceuticals, agriculture, biotechnologies, space research, information and communication technologies, alternative energy and tourism.

The development of tourism is thus high on the agenda for the government of Kazakhstan. Measures to strengthen the sector will focus on the construction of modern infrastructure, the identification of national tourism products and their promotion in international markets and the provision of the industry with highly qualified personnel.

The development of tourism in the country began in 1991 and the first stage is now complete. From chaotic beginnings it has shaped into a thriving independent sector of the economy; however, now it is time to start providing the industry with the crucial theoretical and methodological back up needed to ensure its continued development. The principal requirement for this is the education and training of personnel for the tourism sector through relevant courses in higher education institutions (HEIs).

The higher education sector in Kazakhstan is currently undergoing dramatic reforms, manifested in the joining the Bologna process, the transition towards research universities and the development of an agenda of internationalization. Great effort is being invested in the modernization and improvement of the education system. Issues which currently need to be addressed include quality assurance, promotion of academic mobility, integration into the global education arena, and strengthening the poor links between practitioners and academia<sup>2</sup>. The aim of our work is to develop an efficient model that incorporates a real life outdoor tourism project into the teaching process and curriculum of HEIs in Kazakhstan.

All of the three components outlined above – government support, higher education reforms and tourism industry development – need to be considered together in order to ensure the growth of a competitive higher education sector in the field of tourism in Kazakhstan. Our research is focused on providing a methodological basis for preparing professionals for the tourism sector through the implementation of innovative approaches.

## Methods

The 7 Summits project is run by a Russian club of mountaineers who built on the original idea by American mil-

lionaire Dick Bass of climbing the highest summits on each continent. The club unites mountaineers who set their sights on conquering Mount Kilimanjaro in Africa (5 895 m), Mount Elbrus in Europe (5 642 m), Aconcagua in South America (6 962 m), Mount Denali (McKinley) in North America (6 194 m), Vinson in Antarctica (4 897 m), Mount Kosciuszko (2 228 m) in Australia and finally – the summit of Asia and the world – mount Everest (8 848 m). A Kazakhstan team is actively participating in the project and has so far conquered Kilimanjaro, Elbrus, Aconcagua and Kosciuszko over the last seven years. As a means of promoting interdisciplinary dialogue and interaction between academics and practitioners in the field of tourism, we have incorporated the 7 Summits project into the curricula of HEIs in Kazakhstan.

Undergraduate students majoring in tourism are encouraged to become involved in the preparation for expeditions as a part of their studies. They work in teams on different aspects of the trip, such as transportation, accommodation, meals and services. The students' work is credited in various modules, including Management and marketing in tourism, Organization of tourism business, History and theory of international tourism, Tour operating, Advertising in tourism, English in professional development, and others. Students analyze and compare the results of their work by checking it against real data – i.e. by following online diaries published on a daily basis by a faculty member during the expedition. Therefore, students self-check the accuracy of their end-of-year projects before submission.

## Results and discussion

Over the years, we have tried different models of implementing this project in the curricula and believe we have found the most efficient one. First of all, a business plan for an expedition is prepared. Then students take an examination that covers the theoretical and practical aspects of the core disciplines in their specialization. The tour is undertaken by a university team and the students can then compare their business plan with the actual trip. Students' work is assessed by a faculty member.

The suggested model complies with Bologna principles. It provides students with in-depth theoretical knowledge and practical skills through the opportunity to undergo university training which has a maximum degree of linkage to the reality of the day-to-day tourism business. Through their studies the students develop useful, relevant material that they can use for their theses.

The initiative described is being undertaken for the first time in Kazakhstan, as no other HEI offering specialization in tourism include anything similar in their curricula. The



Figure 1. Fragment of online diary. Ascent to Summit Aconcagua (6 962 m above sea level). Vukolov V.N.

advantage of this model is that it uses a competency-based approach. The currently prevailing system of teaching in Kazakhstan is not well adapted to fostering an understanding of everyday operations in the tourism sector, thus the model presented here will prove to be one of the most effective teaching models.

## Conclusion

The suggested model is designed to ensure students' involvement in a real outdoor tourism project. It allows them to

apply theory in practice, develop valuable skills and sharpen their knowledge of the sector. The model also provides an example of successful cooperation between academia and industry, backed up by improved graduate employment rates. The model curricula will be submitted to the Ministry of Education and Science of the Republic of Kazakhstan with a view to it being rolled out to all HEIs with tourism majors following our ascent of Mount Everest in three years.

1. The State Program of Accelerated Industrial and Innovative Development for 2010–2014 ratified on 19<sup>th</sup> March 2010 N958 by the Republic of Kazakhstan President's Decree.

2. The State Program of Education Development for 2011–2020 ratified on 7<sup>th</sup> December 2010 N 1118 by the Republic of Kazakhstan President's Decree.

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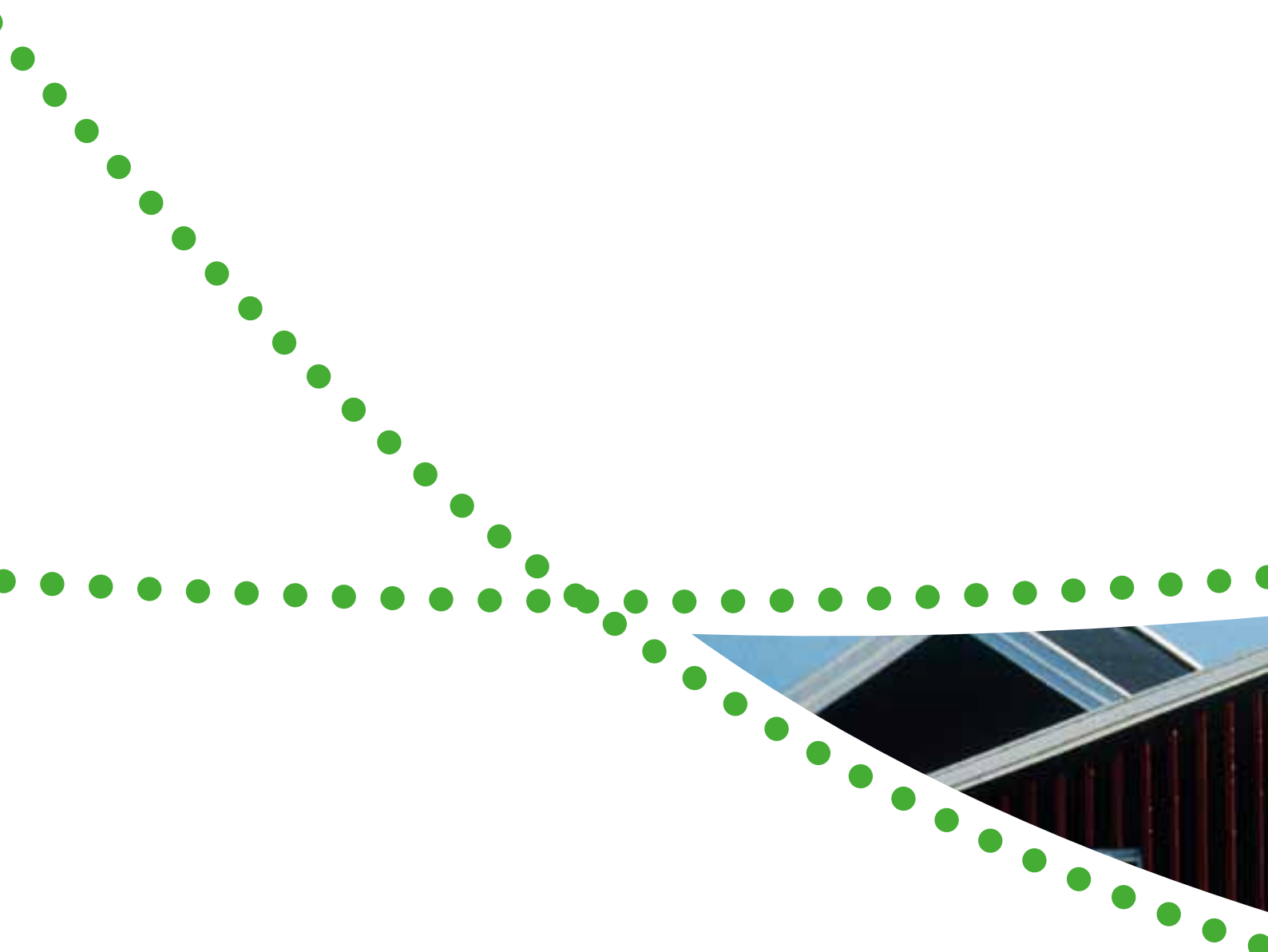
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A decorative graphic consisting of a series of green dots. It starts at the top left, curves downwards to the right, then continues horizontally across the middle, and finally curves downwards to the right again, ending near the bottom right. The dots are of varying sizes and are arranged in a way that suggests movement or a path.

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A photograph showing a close-up of a building's structural elements, including a dark roof and a window frame with a grid pattern. The image is partially obscured by the green dotted line graphic.

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