Photo: Ilpo Okkonen

Nature and Tourism: Tools for Sustainability

International Conference
Arctic Centre, University of Lapland
Rovaniemi, Finland, 22-24 May 2007

Abstract book

Tourist Destinations as Landscape Laboratories — Tools for Sustainable Tourism (LANDSCAPE LAB)
EU LIFE Environment Project

LANDSCAPE LAB

ARCTIC CENTRE

Life

UNIVERSITY OF LAPLAND
LAPIN YLIOPISTO

Nature and Tourism: Tools for Sustainability

International Conference

organized by

Tourist Destinations as Landscape Laboratories – Tools for Sustainable Tourism (LANDSCAPE LAB) EU LIFE Environment project

21-24 May 2007, Arctic Centre, University of Lapland
Arktikum house, Rovaniemi, Finland

Abstract book

Kaisanlahti-Jokimäki, M.-L., Jokimäki, J., Kivilahti, R. and Härkönen, J. (eds.)

Publisher: Arctic Centre, University of Lapland
Front cover picture: Ilpo Okkonen

Yliopistopaino, Rovaniemi 2007

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PROGRAM

Tourist Destinations as Landscape Laboratories – Tools for Sustainable Development
(LANDSCAPE LAB) EU LIFE Environment project
organizes an International Conference:

Nature and Tourism: Tools for Sustainability
21-24 May 2007

Monday 21 May

14.00-16.00 Registration, Arktikum house, Pohjoisranta 4
18.00-21.00 Welcoming Party, Metla (FFRI) Rovaniemi Research Unit, Eteläranta 55, Transportation from the Arktikum house at 17.45

Tuesday 22 May

08.00-10.00 Registration, Arktikum house
10.00-11.00 **Opening Words and Invited Speeches**, Arktikum house, Polarium
Professor Paula Kankaanpää
Project coordinator Jukka Jokimäki
Project manager Sami Laakkonen
11.00-12.00 **Keynote lecture by Professor Andrew Holden**: 'The problematique and opportunities of the relationship between tourism, community and the environment'

12.00-13.00 Lunch break

13.00-15.00 **Social and Cultural Sustainability of Tourist Destinations**
(**Theme 3) Moderator: Dr. Mikko Jokinen**
Dr. Seija Tuulentie: 'Local participation as a prerequisite for sustainable development of tourist centres'
Prof. Liisa Tyrväinen: 'Tools and approaches for combining forest-based tourism and forestry in Finland'
Dr. Leena Suopajärvi: 'Role of forestry in tourism areas: case-studies from Ylläs and Levi'
MA Simo Sarkki: 'Emerging coalitions as tools for social sustainability? – National parks and economy forests as tourist destinations'
Dr. Minna Hares: 'Forest conservation and tourism – a case of Thailands upland ethnic minorities'
M.Sc. Ilona Mettiäinen: 'Local viewpoints on the multiple-use of nature in Finnish Lapland'

15.00-15.20 Coffee break

Tuesday 22 May, continues

Moderator: Dr. Seija Tuulentie

15.20-17.20 Project Manager Kari Salovaara: 'DestiLink – Network on sustainable tourism destination development'
M.Sc. Mikko Jokinen: 'Social sustainability in tourist villages in Ylläs and Levi – Locals' opinions'
M.Sc. Jose-Carlos Garcia-Rosell: 'Using action research in service development to promote sustainability'
Deputy Director Svetlana Belova: 'Protected areas and benefits: Russian experience'
Dr. Anna Stammler-Gossman: 'How many Santa Clauses? The concept of tourism in the Russian North'
Director Niels Einarsson: 'From good to eat to good to watch: Whale watching, adaptation and change in Icelandic fishing communities'

17.30-19.00 Poster Session and snacks, Arktikum house, Aurora room

Wednesday 23 May

08.00-09.00 Registration, Arktikum house

09.00-11.00 **Scope and types of environmental impacts of the tourist destinations (Theme 2) Moderator: Dr. Yrjö Norokorpi**, Arktikum house, Polarium
Dr. Jukka Jokimäki: 'Bird species as indicators of the changing tourist destinations'
Dr. Pirkko Siikamäki: 'Analysis of sustainability of nature-based tourism and recreation in Oulanka National Park, Finland'
Dr. Pekka Helle: 'The impacts of tourism on wildlife in Finnish Lapland'
M.Sc. Tuomas Heikkilä: 'Effects of nature-based tourism on mammal densities on three different levels of disturbance in western Finnish Lapland'
M.Sc. Matti Aalto: 'Impacts of nature-based tourism on bird communities of Pallas-Yllästunturi National Park in Finnish Lapland'

11.00-12.00 Lunch break

12.00-13.00 **Keynote lecture by Doctor Paola Laiolo**: 'Monitoring the effects of ski resorts on wildlife'

13.00-13.40 **Scope and types of environmental impacts of the tourist destinations (Theme 2) Moderator: Dr. Jukka Jokimäki**
Phil.Lic. Kristina Lehtinen: 'Geological factors affecting soil erosion on nature trails in northern Finland'
Dr. Pekka Sulkava: 'Erosion and changes in vegetation caused by nature-based tourism in the camp sites of the Pallas-Yllästunturi National Park, NW Finnish Lapland'

13.40-14.00 Coffee break

Wednesday 23 May, continues

14.00-16.20 **Ecologically, culturally and visually sustainable urban structures in tourist destinations (Theme 1) Moderator: Dr. Kari Laine**

14.00-15.00 **Keynote lecture by Professor Richard Butler**: 'Tourism destination development and the environment'

15.00-16.20 **(Theme 1)**
Scientist Marja Uusitalo: 'Landscape analyses – the first step in managing sustainable land-use at tourist resorts'
Dr. Pertti Sarala: 'Geology and its implication to landscape structure at Ounasselkä fell region in western Finnish Lapland'
M.Sc. Outi Rantala: ' Wilderness forests and built paths: A frame analytical interpretation of tourists´forest landscape experiences in Lapland'
Mr. Motti Essakow: 'Reducing the ecological and carbon footprint impact of travellers in skiing destinations'

18.30 Transportation to the dinner place at the Vaattunki lodge-estate, departure from the Arktikum house, Pohjoisranta 4

19.00-22.00 Conference dinner at the Vaattunki lodge-estate (price 40 euros)

Thursday 24 May

08.00-09.00 Registration, Arktikum house

09.00-09.20 **(Theme 1) Moderator: M.Sc. Marja Uusitalo**, Arktikum house, Polarium
Dr. Tarja Outila: 'Tourist destinations in northern Finland – designing new types of urban densities and settlements by means of land use planning'

09.20-11.00 **Hardy plants for landscaping and restoration in northern tourist destinations (Theme 4)**
Director Kari Laine: 'LABPLANT: Hardy plants for northern landscaping'
Phil.Lic. Henna Pihlajaniemi: 'Growth success and phenology of micropropagated woody ornamentals in northern Finland'

10.00-11.00 **Keynote lecture by Dr. Dagmar Hagen**: 'Restoration ecology as a management tool in the development of sustainable tourism in arctic and alpine regions'

11.00-12.00 Lunch break

12.00-13.00 Summary and closing remarks

13.00-14.00 **Farewell outdoor coffee in the Arctic Garden**

14.00-15.00 **Visit to The Arctic in Change -new exhibition**,
Science Centre, Arctic Centre

ABSTRACTS

Impacts of nature-based tourism on bird communities of Pallas-Yllästunturi National Park in Finnish Lapland

Aalto, Matti[1], Sulkava, Pekka[2], Huhta, Esa[3], Aalto, Pirkka[4] and Putkonen, Mikko[5]

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Nature-based tourism is growing rapidly worldwide. In Finland, national parks are the major attractions of nature-based tourism. Tourism has caused changes in vegetation, deterioration of soil, and accumulation of rubbish in the camp sites of the national parks. The aim of this study was to find out what impacts nature-based tourism has on bird communities near the camp sites and along the trails of Pallas-Yllästunturi National Park. Habitat change, disturbance and human caused resources, like supplemental food and hiding places, were assumed to have impacts on species and even bird communities.

Bird communities were censused by point counts (5 minutes observation per point) in 360 different sites. Censuses were replicated in three consecutive years: 2004, 2005 and 2006. Point count censuses were done as a gradient from urban areas (villages/tourist centres) to camping sites and walking trails. Control areas were selected from biotopes similar to the walking trails and placed some 300 to 500 metres away from the trail.

Preliminary analyses of the study material show that bird communities change not only in the urban areas but also in the camp sites, when compared to the control areas. As predicted, urban areas and camp sites functioned as hot spot areas for birds. Some common species, like the Barn Swallow (*Hirundo rustica*), Magpie (*Pica pica*), House Sparrow (*Passer domesticus*) and Yellowhammer (*Emberiza citrinella*) were only found in urban areas. Densities of many species, like House Martin (*Delichon urbicum*), Fieldfare (*Turdus pilaris*), Pied Flycatcher (*Fichedula hypoleuca*), Great Tit (*Parus major*), Crow (*Corvus corone cornix*) and Greenfinch (*Carduelis chloris*) were enhanced remarkably in the urban areas. Two box nesting species, the Pied Flycatcher and Great Tit, were also more abundant in camp sites than in the control areas. Bird communities near the walking trails were very similar to the ones in the control areas.

This study shows that Lapland's bird communities do not suffer from nature-based tourism on current visitor pressure. Walking trails have very small impact on avifauna and the bird communities of the camp sites were even richer than the ones of the control sites. Changes in bird densities between camp sites and control areas are most likely due to the more flourishing biotope of the camp sites. On the other hand it has been shown that tourism has negative impacts on certain (endangered) species, such as large predators, that could not be counted with this method.

The study is a part of the EU LIFE Environment funded project LANDSCAPE LAB.

Protected areas and benefits: Russian experience

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The conservation of the valuable natural, historical and cultural heritage of Russian protected areas (PA) depends to a large extent on the socio-economic situation. This is especially true for rural populations, a significant part of which now lives below the poverty line. Almost all of Russia’s PAs are located in rural areas.

Sharp falls in employment and in real incomes are forcing individuals to look for additional sources of sustenance, which is leading to uncontrolled growth of resource utilization in PAs.

Under such circumstances, the sustainable development of PAs and surrounding areas aimed at achieving increasing level of life of local communities becomes a key factor in determining the successful conservation of our natural heritage.

The specific attractiveness of the heritage conserved in PAs provides an especially favorable environment for tourism, the development of recreational and related services, and ecological, and cultural education for visitors. These activities can ensure income generation for local communities; in many regions they constitute the only way to provide local communities with sustainable economic activities alternative to their current economically inefficient and environmentally harmful livelihoods.

The project “Catalyzing civil activities and local socio-economic initiatives using the potential of protected areas and PA-based NGOs” implemented by “Ecocentre “Zapovedniks” in partnership with EUROPARC is aimed to development sustainable tourism on two pilot areas – nature reserve «Bolshaya Kokshaga», Mary El Republic, and biosphere reserve «Baikalsky», Republic of Buryatia

The main outcomes are: 1. Local attractiveness for investments was significantly increased, 2. Political support and local awareness of protected areas were developed, 3. New partnerships for tourism development were created and 4. Active public involvement to tourist services was initiated.

Tourism destination development and the environment

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UNITED KINGDOM

Tourism destinations take many forms and are comprised of many different attributes, but one of the most universal attractions is the environment, both of the destination and that in which the destination is located. Change occurs inevitably as destinations are developed and grow, both in the destination and its surrounding area. In most cases change equals development which in turn equals a loss of the inherent attributes of the natural environment. Whether this loss is sufficient to make the destination less attractive to potential tourists is often not determined until a decline in visitation actually takes place. As greater attention is paid to the concept of sustainability, the question of the nature of the relationship between tourism and the natural environment assumes greater importance. The paper reviews the reasons why tourism has such an ambiguous relationship with the environment and questions how, if at all, such a relationship can be regulated and controlled. It discusses some examples of ways in which attempts have been made to ensure the maintenance of an attractive natural environment in areas which receive considerable use by tourists and their relative success and failure. Issues including carrying capacity, destination attractiveness, zoning, and environmental impact indicators and monitoring are explored and reviewed in the context of the process of destination development.

The paper argues that, because of the great variety of destinations and the resulting wide range of pressures to which they are exposed, there can be no single approach which would be universally successful in resolving the problems inherent in the relationship between tourism and the environments in which it occurs. Instead, a multi-focused approach is necessary which reflects not only the environmental characteristics of a destination, but also the type and level of tourism, the aspirations of the local communities, and overall economic goals of the parent state. It is also argued that different approaches and combinations of actions are necessary at different stages of a destination's development, with the recognition that the earlier appropriate action is taken, the greater the likelihood of achieving some of the goals with respect to the environment. The paper warns against naïve assumptions about the relationship between tourism and the environment and about the supposed "greening" of the tourist market. It argues that the apparent greater environmental awareness and concern may well result in more serious incursions into the most sensitive environments with the development of even greater problems than those currently faced, and that appropriate policy implementation rather than feel-good policy creation is essential if the integrity of the environmental leg of the "triple bottom line" of sustainable development is to be ensured.

From good to eat to good to watch: Whale watching, adaptation and change in Icelandic fishing communities

Einarsson, Niels

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600 Akureyri
ICELAND

Many scholars of Arctic and North Atlantic fishing communities have doubted the prospects of a viable whale watching industry due to perceived local opposition and traditional consumptive attitudes toward marine mammals and their uses.

The topic of this lecture is the introduction of the internationally growing industry of whale watching in a fishing village in north-east Iceland and how local inhabitants reconcile opposing views on whales, whaling and the new cetacean tourism.

The lecture also discusses the conflict between fishermen and marine mammals and how it is managed in an area where fishing is still the mainstay of the economy and marine mammals are by many seen as competitors for scarce resources, even as pest.

Furthermore, this case study is used to address the wider issues of adaptation, viability and resilience in small resource-dependent coastal settlements coping with rapid social and ecological change.

Reducing the ecological and carbon footprint impact of travelers in skiing destinations

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If everyone in the world were to consume natural resources and generate carbon dioxide (CO_2) at the rate people do, we would need many more planets to support us. We only have one livable planet and we are using resources at a faster rate than nature can replenish them. However, there is a way in which we can live and travel within the earth's natural capacity and still enjoy a high quality of life. It is called "One Planet Living" (Wellbeing for People. Wellbeing For Nature)

In order to achieve One Planet Living it is essential that humanity improves its overall Ecological and Carbon Footprint and thus begin the process of restoring and replenishing (not only protecting) our only livable ecosystem. The Ecological Footprint is a resource management tool that quantitatively measures and describes how much land and water a human population requires to produce the resources it consumes and to absorb its wastes under prevailing technology in order to determine the following: 1. How much of the regenerative capacity of the planet is occupied by human activities and 2. How intensely are ecosystems being used (and abused).

In other words, in order to live we consume what nature offers. Every action creates a reaction which also creates an impact of the planet's ecosystem. This is usually of little concern as long as human use of resources does not exceed what the earth (bio capacity) can renew and replenish.

Currently the Ecological (including Carbon) Footprint methodology has not yet been realized and recognized by the global eco / sustainable tourism industry (the term "Ecological Footprint" is mostly used in generic terms Within the global travel and tourism sector there is a growing realization that "tourism" especially "local travel and tourism" needs to be redefined, especially in the context of reducing our overall Ecological and Carbon Footprint impact on destinations. In addition, there is a growing recognition of redefining "Sustainability" in its entire context (socio / cultural, economic, wellbeing and nature – also known as the NEW Quadruple Bottom Line) and without trade offs.

The focus of this presentation is: 1. What is the Ecological and Carbon Footprint, 2. What is the connection between the Ecological and Carbon Footprint and eco / sustainable tourism in its entire context (socio / cultural / economic, wellbeing and nature), 3. Practical examples of how to measure and reduce the Ecological and Carbon Footprint impact of travellers in skiing destinations, 4. Practical examples of how to measure and reduce the Ecological and Carbon Footprint impact of planning and development and operations in all the various skiing sectors in destinations, 5. Practical awareness raising examples for local communities and travellers of how to reduce their Ecological and Carbon Footprint impact in destinations and 6. Practical examples of sustainable management (beyond environmental management) in skiing destinations.

Using action research in service development to promote sustainability

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The introduction of sustainable development by the Brundtland Commission in 1987 brought a new perspective into the discussion on the role of business in society. Since then, firms have been expressing their interest and commitment to environmental and social causes—issues usually thought to be opposed to the idea of profit maximization—in new ways. Over the years, sustainability has become part of the daily business rhetoric, and an extensive body of literature has emerged on the topic. In the practice of business organizations, however, the very notion of sustainability has remained ambiguous. In fact, sustainability seems to take different meanings in different political, socioeconomic and moral contexts.

I argue here that sustainability can be achieved only through social processes and collaborative practices, where different stakeholders negotiate the meaning of sustainability in business practice. Thus, the development of business activity towards more sustainable practices requires multi-stakeholder engagement, continuous moral reflection and changes in the organizational culture. In my study, I aim to develop an action research approach to sustainability that allows organizations to become aware of these processes and practices, and which enables them to develop a more holistic sustainability initiative that can be introduced gradually into the organizational culture. More specifically, my objective is to elaborate on these processes and practices in the empirical context of service development, where the interactions between different actors form the basis of the business offering.

In this paper, I present preliminary findings from an ongoing action research project carried out in the Finnish province of Lapland. The general purpose of the project is to determine to which extent the use of action research in the service development process can contribute to increasing understanding on sustainability and thus fostering its consolidation within an organizational setting. The project also aims at developing tourism services that are attuned with the values, norms and beliefs of the entrepreneurs involved. The data consist primarily of seven convergent interviews that were implemented in the planning stage of the study. The aim of these interviews is to construct a common understanding on sustainability that is accepted and supported by a business network of seven rural micro enterprises. This is based on the idea that a shared understanding on sustainability evolves continuously as the perspectives of key stakeholders regarding the services of the network are integrated into the construct.

Restoration ecology as a management tool in the development of sustainable tourism in arctic and alpine regions

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Severely modified or disturbed nature areas are traditionally considered as “lost”. By using the theoretical framework and knowledge from restoration ecology these areas can retain values as recreation areas or nature- and wilderness areas. Restoration of disturbed sites or objects can create areas of ecological, aesthetical, cultural, or landscape qualities for the environment and for people.

Today we face increased pressure on mountain areas ranging from large scale commercial activities, like hotels, downhill slopes and recreation homes to traditional hiking. In Norway economic development in nature and wilderness areas are strongly motivated by the National Authorities, and imply new challenges to the management of these areas.

Human activity in vulnerable areas causes effects on vegetation and landscape. The scale and consequences depend on factors related to the activity itself (type of activity, frequency, range) and conditions at the locality (hydrology, soil, terrain, climate, vegetation type). Effects can be measured as loss of vegetation cover, changes in species composition, aesthetical effects on landscape etc.

In development of sustainable tourism the primary goal must be to avoid or minimize the damages to vegetation and landscape. Planning and management procedures are essential to prevent the need for expensive and time-consuming restoration efforts. But in some situation restoration efforts are inevitable. Restoration is a goal oriented and multidisciplinary activity. The science of ecology is essential to describe the status of a site, to set up realistic goals for restoration and to evaluate effects. However, successful restoration requires an expanded and integrated approach including technological, social, political, economical and aesthetical considerations.

Restoration in arctic and alpine areas imply special problems and challenges, due to low temperatures, limited water availability during part of the year, and low levels of soil nutrients. Numerous methods of restoration methods exist, ranging from pure scientific small-scale experiments to large-scale practical enterprises. Poor availability of plant material has traditionally prevented the use of native species in restoration, but these methods have improved during the last decade, including seeds, transplants, cuttings and plants. The application of nutrients or soil is another group of improving methods for restoration. Methods for restoration must be site and situation specific.

Evaluation of spatial and temporal scale is essential for the formulation of goals and for the evaluation of success in any restoration project. Preferences, ambitions and assumptions differ much between projects. Development of sustainable tourism involves preferences related to the protection of biodiversity, nature and social values.

Forest conservation and tourism - a case of Thailand's upland ethnic minorities

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Protected forests in northern Thailand face a two-fold problem which is familiar also in many other conservation areas in the tropics: on the one hand, protection of biodiversity and the last remaining forests is regarded crucial and, on the other hand, people who live in and adjacent to protected areas need options for livelihood. Moreover, it is generally accepted that biodiversity considerations should be integrated in poverty reduction strategies. This paper looks at nature tourism as an alternative source of livelihood that would also benefit goals of forest conservation. The aim is to discuss the prospects of developing community-based ecotourism in the upland villages inhabited by ethnic minorities and the threats and opportunities of nature tourism in protected forest areas of northern Thailand. The discussion is based on literature review and experiences from the fieldwork in Chiang Mai Province.

The population in the northern uplands under examination, where the forests are protected for the most part, is largely comprised of ethnic minorities. These minorities have been called as hill tribes and the government has recognised a "hill tribe problem" that has referred to forest destruction by slash-and-burn cultivation, illegal migration, political instability, and poverty. The dilemma between conservation and livelihood in the area is acute, and at the community level the issue is viewed within the framework of livelihood assets that refer here to a wide range of resources that people use to make living including human, natural, produced, social and cultural capital. This framework links rural livelihood and natural resources, their use and management. A significant aspect is access to resources and also access to opportunities to turn the resources into livelihood and improve the existing ways.

Tourism is reviewed as a payment for environmental services (PES) scheme. As the experiences of PES in the tropics are mainly from Latin America, an interesting question is how this political instrument could work in the context of Thailand, as a tool to integrate goals of conservation and improved livelihood in protected areas. Tourism is highly important for the country's economy and promoted by Thai government. Recently tourism has increasingly started to stretch among ethnic minority communities. This can provide benefits but also lead to problems. Therefore, involvement of local people to develop community-based tourism is essential. This requires adaptive natural resource management strategies that comprehensively consider social, cultural, economic and ecological aspects.

Effects of nature-based tourism on mammal densities on three different levels of disturbance in western Finnish Lapland

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In Finland, major attractions of nature-based tourism are national parks and tourist destinations in Lapland. The aim of this research was to study impact of nature-based tourism on mammal densities on three different levels of human impact in Western Finnish Lapland. Main interest of this study was to assess whether mammals are capable of exploiting human caused resources, like supplemental food and hiding places, and how much nature-based tourism impacts mammal populations.

Mammal densities were censused by snow-track census and small mammal snap-trappings from one hectare study plot in 60 different study areas: 20 areas in three popular tourist destinations (only snow-track census, by FFRI and FGFRI) and 20 campfire sites in the Pallas-Yllästunturi national park with 20 control areas (by FFPS). Control areas in the national park were approximately 500 to 1000 metres from the campfire sites representing similar biotopes. These areas represent three levels of human disturbance: high, intermediate and no impact, respectively. Censuses in national park were replicated in two consecutive years in 2005 and 2006, but were done only once in 2006 in tourist destinations. Snow-track censuses were done using line method in yearly spring. Snap-trapping censuses were done using small-quadrat method in two 15-day periods per year. They were carried out only in the national park.

In snow-track census, nature-based tourism increased densities of the arctic hare *Lepus* timidus, the fox *Vulpes vulpes* and mustelid (Stoat *Mustela erminea* and Least Weasel *Mustela nivalis)* populations in the campfire sites. Squirrel (*Sciurus vulgaris*) densities were equally high in tourist destinations and campfire sites but remarkably higher than in the control areas. Tourism did not have effect on densities of voles and willow grouse (*Lagopus lagopus*). In snap-trapping census, densities of nearly all vole and shrew species were higher in the campfire sites than in the control areas. Densities of the bank vole *Myodes glareolus* and the field vole *Microtus agrestis* were especially enhanced.

In this study it was shown that mammals can also benefit from nature-based tourism. This may be due to more exploitable food resources and diverse habitats in human-impacted areas. However, species showed disparate tolerance levels. Many species benefited from tourism on intermediate disturbance level, but on a higher level tourism had negative impact on e.g. hare population densities. In addition, tourism may also have negative impact on certain (endangered) species, such as larger predators. Nevertheless, these results provide new insight into effects of nature-based tourism on mammals.

The study is a part of the EU LIFE Environment funded project LANDSCAPE LAB.

The problematique and opportunities of the relationship between tourism, community and the environment

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This paper explores the relationship between tourism, communities and the environment. It suggests that whilst community based conservation (CBC) and community based tourism (CBT) offer real opportunities for natural resource protection and sustainable tourism development, the relationship between tourism, communities and environment can also be problematic and not necessarily a blueprint for a harmonious relationship. Whilst community involvement is often advocated as a positive principle for sustainable tourism development, it cannot necessarily be a taken assumption that communities will act as stewards of the environment. Hardin's (1968) parable of the Tragedy of the Commons still holds many truths with regard to aspects of human behaviour, as does philosopher Thomas Hobbes' concept of 'psychological egoism' or behaviour driven by self-interest.

Neither can how community involvement in tourism manifests itself be separated from issues of political economy and hegemony. Similarly, the type of environmental ethic that is held in cultural and belief systems will influence community relationships with nature. Thus whether communities use natural resources in an instrumental fashion or act as stewards of nature is likely to be an outcome of a mix of different factors. Yet, as was conceptualised by Boulding (1973) in 'spaceship earth', we know that the planet does not have unlimited natural resources. Tourism offers an opportunity to build a model of sustainable development that incorporates both resource conservation and long-term livelihood benefits. Nevertheless, we are also aware that tourism can be a destructive force upon the environment.

Drawing theories predominantly from environmental philosophy, this paper considers the factors that are likely to influence how community relationships with tourism manifest themselves. Based upon examples of successful community based models of resource conservation through tourism, it highlights the key principles of success, to suggest a model of transferability to other areas. Given the context of an uncertain future for tourism, as existing patterns of recreational tourism are likely to be threatened by climate change, the paper also considers the relationship between tourism, community and environment into the future.

Bird species as indicators of environmental changes at tourist destinations

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The expansion of tourism into pristine areas may disturb wildlife, and lead to the avoidance by wildlife of otherwise suitable habitats. However, the effects of tourist destinations on nature have not been adequately studied. We studied the impacts of ski resorts on breeding bird communities in northern Finland. Bird counts at 356 survey sites were done along an urban gradient: from the towns (Rovaniemi and Kuusamo) via the urban core of the tourist destinations (eight ski resorts) to the surrounding forest areas of the tourist destinations during 2005-2006. We assumed that the species composition should change along this urban gradient. Our aim was to find suitable bird species for monitoring the environment at the tourist destinations.

Based on our data, we classified bird species into six groups according to their sensitivity to urbanization: 1. Species that do not inhabit tourist destinations even if they live in their surroundings, 2. Species that occur both at tourist destinations and their surroundings, but whose abundance is much lower at tourist destinations, 3. Species that occur at tourist destinations, but are absent from towns, 4. Species that occur both at tourist destinations and in towns, but whose abundance is higher at tourist destinations, 5. Species that occur both at tourist destinations and in towns, but whose abundance is lower at tourist destinations, and 6. Species that occur in towns but not at tourist destinations.

Group 1 included the following species: the Western Capercaillie and the Tree-toed Woodpecker. Group 2 included the following species: the Tree Pipit, the Redstart, the Mistle Thrush and the Brambling. Group 3 included the following species: the Cuckoo, several waders, the Woodpigeon, the Black Woodpecker, the Skylark, the Meadow Pipit, the Siberian Tit and the Jay. Group 4 included the following species: the Song Thrush and crossbills. Group 5 included the following species: the White Wagtail, the Fieldfare, the Great Tit, the Blue Tit, the Magpie, the Hooded Crow, the House Sparrow, and the Greenfinch. Group 6 included the following species: the Feral Pigeon, the Swift, and the Jackdaw. The species included in the first two groups could be referred to as “avoiders of tourist destinations”, those included in Groups 3 and 4 could be referred to as species adapted to tourist destinations, and the species included in Groups 5 and 6 could be referred to as urban exploiters.

The occurrences of species belonging to Group 6 at tourist destinations indicate that such a tourist destination resembles a town. A high abundance of species belonging to Group 5 indicates that the tourist destination has already gained some urban features. Lack of the species belonging to Group 3 and a low abundance of species belonging to Group 2 may be seen as an early warning signal of the onset of urbanization. We suggest that at least the species belonging to Group 5 should be monitored at tourist destinations. This study is a part of the EU LIFE Environment funded project LANDSCAPE LAB.

Social sustainability in tourist villages in Ylläs and Levi –Locals 'opinions

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According to the principles of sustainable tourism and its social aspect, it is important to take into the consideration the local culture and community of the destination. It is also important to take care that the locals have opportunity to join planning processes concerning tourist destinations. The purpose of this research was to study local people of Ylläs and Levi (in northern Finland) opinions on the development of tourist and districts they live in. The purpose was also to chart out the locals' opportunities to take part in tourism planning and development and their willingness for this.

The research data for the qualitative research were collected through questionnaires sent to 120 locals of Sirkka (Levi area), Äkäslompolo and Ylläsjärvi (both from Ylläs area) villages, who were chosen by random sampling. The interviews were made by phone a week after sending the questionnaires. To its full extent the material consisted of 57 interviews.

The locals seemed to be quite satisfied with the current situation. 74% of all were satisfied with the current situation. Though, the satisfaction applies only this moment, many villagers being concerned about the future. The volume and rapidity of the growth of tourism is seen threat to local culture, nature and landscape. General satisfaction towards development of local tourist centre was 100% in Ylläsjärvi, 75% in Sirkka and 52% in Äkäslompolo. Opportunities to take part in tourism development were also seen very different.

In Ylläsjärvi it seems to be possible for locals to take part in tourism planning if they want, while in Sirkka and Äkäslompolo opportunities are considered to be weak. Between the villages there are also differences in the ways how locals would like to participate.

Ylläs and Levi are tourist centres with different profile. Ylläs is profiled more for families and nature-based tourism, Levi is the place of young people and the ones who like nightlife. According study, different profiles should remain. Locals at Ylläs region think that centre should not be done "another Levi".

For sustainable development the improvement of consideration of local needs and values is crucial. The satisfaction of the locals has a great impact on how tourists experience their trips. Local people's acceptance for tourism in general also helps companies to operate in the area.

The study is a part of the EU LIFE Environment funded project LANDSCAPE LAB.

LABPLANT: Hardy plants for northern landscaping

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Growing conditions for plants in the north are harsh. In order to search and produce hardy plant material for landscaping and restoration in northern areas an EU LIFE Environment funded subproject called LABPLANT was launched by the Botanical Gardens of the University of Oulu and Lapland Vocational College, Department of Natural Resources and the Environment, in autumn 2004.

So far over 100 hardy plant species have been propagated, mainly *in vitro*, (31 woody species, 16 dwarf shrubs, and 59 herbs/grasses) and some of them are already planted at the demonstration areas. These northern species include, for example, *Betula nana*, *Salix lapponum* and *Viola biflora*.

Demonstration areas in the Pallas- Yllästunturi National Park and in Ylläs and Levi tourist areas, located above the Arctic Circle, serve as examples of sustainable landscaping and restoration in northern tourism areas *in vivo*. They are also valuable sites for future studies on sustainable tourism and plant use.

Demonstration areas and plant collections at the Botanical Gardens and Lapland College will act also as gene banks for mother plants. Results of the task will provide new tools for improving the environment and restoring damaged areas.

Monitoring the effects of ski resorts on wildlife

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Winter sport resorts are primarily planned and managed to be useful, friendly and comfortable to people, not to the landscape, natural habitat or wildlife. Recent studies highlighted that skiruns play a prominent role in degradation and fragmentation of alpine habitats, and that the tourists they attract can stress wildlife. I will present two study cases on the effects of ski resorts on the alpine avifauna. First, I will report of the indirect effects of skiruns (through habitat loss and fragmentation) on the bird communities breeding in montane forests, comparing bird diversity of plots located in forest interior, forest at the edge of skiruns, and forest at the edge of pastures. Second, I will analyse the direct effects of winter sport activities on the daily movements and time budget of a typical alpine species, the Alpine Chough *Pyrrhocorax graculus*. Two populations were studied, from a ski resort site and from a protected natural area.

Skiruns had negative effects on forest birds, and plots at their edges presented lower bird species richness than those located in forest interior, or at the edges of pastures, where avian diversity thrived. Contrasting results where obtained when analysing the effects of ski resorts on the daily activity of the alpine chough. Home range size, distance between foraging and roosting sites, and time budget greatly differed between the two areas. Birds from the natural reserve adjusted their movements and activities according to snow cover, with larger daily movements and greater use of lower altitude feeding grounds when snow cover was deeper. In the ski resort area, birds did the opposite, restricting their movements when snow cover was deepest, and gathering in high altitude ski resorts to feed on scraps provided by tourists.

These studies show that ski resorts do create disturbance in the alpine ecosystem both at the community and at the individual/population level, by causing forest bird diversity to drop and altering individual behavioural patterns. In the first case, it seems unequivocal that sports activities have an overall negative effect on the bird community. In the latter case, the study species has a very flexible foraging ecology and clearly adapted to coexist with skiers, but the fitness consequences of such drastic behavioural shifts should be examined. Further research on the impact of skiruns on wildlife (at all levels, from the community to the individual) is mandatory to manage winter sport activities within sustainability.

Geological factors affecting soil erosion on nature trails in northern Finland

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Increasing tourism, round-year use and new activities cause erosion on nature trails around tourist centers. Monitoring and preventing erosion damages and professional and sustainable planning of new trails are required to observe the nature and to keep trails attractive for tourists. Studies on the erosion resistance of nature trails in Finland have been traditionally focused on the vegetation and trampling resistance. Geological factors have not been studied in this manner earlier. Geological factors in the land use and the erosion rate of the nature trails are studied by the Geological Survey of Finland as a part of the EU LIFE Environment funded LANDSCAPE LAB project. The purpose for studying geological factors affecting the erosion rate is to find equipment to estimate erosion problems on nature trails. The aim of this study is to create a classification of erosion resistance for different type of geo-environments in northern Finland.

The study areas consist of 10 different types of tourist destinations in northern Finland including Kätkätunturi in Sirkka and Yllästunturi in Ylläs, which belongs also to the LANDSCAPE LAB project study area. The other target areas are Aakenustunturi in Kittilä, Pallas in Muonio, Ounasvaara in Rovaniemi, Pyhä-Nattanen in Sodankylä, Kiilopää in Ivalo, Ruuhitunturi in Salla, Pieni-karhunkierros in Kuusamo and Pytkynharju in Pudasjärvi. The selection of target areas was based on the variations in bedrock quality and geological history. Hypothesis was that the soil erosion has correlation with the quality of bedrock and soil, grain size distribution, adsorption properties, topography, geomorphology, vegetation, climate, amount of visitors and, the way and season when of the rout is used.

From each route 3-6 sites were chosen. The erosion rate was estimated visually and by measuring the width and depth of trail, stoniness of the surface and amount of exposed roots. Soil and stone samples on the trail and beside it were taken from each site. Soil samples were sieved and the grain size distribution determined. The rock type and roundness of the stone samples were specified. Geophysical measurements were made in early summer and autumn at every sample site to find out the differences on water content.

The preliminary results show that there are differences in the erosion resistance based on the geological properties in the different geo-environments studied. Results also indicate that erosion resistance based on vegetation is not always correlative with the erosion resistance based on the geological factors.

Local viewpoints on the multiple-use of nature in Finnish Lapland

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Nature and natural resources are, and have traditionally been, considered the best future possibilities for Lapland. Nature is a common resource for different livelihoods and there are several different interests towards the use of nature. In tourist centres, the multiple-use questions are located in the element of wilderness-like nature, next to rural villages and urbanising tourist city centres.

There have been many changes in the relationships of forestry, reindeer herding, tourism, nature protection and the local inhabitants' traditional forms of nature-use during the last decades and years. For example forestry has traditionally been the most important livelihood in Lapland, but the growth of tourism industry has lately lead to a situation where the hegemony of forestry has been questioned also from the economical point of view, especially nearby tourist centres.

Beyond economy, the use of nature affects the everyday lives of local inhabitants. Research has mainly been interested in the actions of environmental organisations in environmental conflicts, whereas the local inhabitants' viewpoints have gained less attention. However, from the social sustainability point of view, the effects of the use of nature on also the local inhabitants' every day lives should be considered.

This abstract presents some results from my work at FFRI (Finnish Forest Research Institute) in LANDSCAPE LAB –project about social sustainability in tourist centres, based on focus group interviews among local actors, and my Master's Thesis study on the local inhabitants' viewpoints on the multiple-use of nature in the early 2000's in Finnish Lapland. The data of the thesis consisted of 308 newspaper articles in the regional newspaper Lapin Kansa and it was analysed using argumentation and discourse analysis.

The results show that multiple-use of forests has a high legitimacy among the local residents in Lapland. The discourses that the nature-use policies are discussed and land-use forms are valuated in relation to each other in the public discussion are economy, sustainability, especially ecology, trust and law, local culture(s), multiple use and peripheriality. Despite many conflicts and unsolved questions in the multiple-use of natural areas, there are some things most participants agree on, eg. that the local residents should benefit from the use of the natural areas and resources in their home region and that also the local inhabitants' traditional ways of using the nature should be taken into account. Despite contradicting interests towards the nature, nature-based livelihoods are reconciliated and seen vital for the regional development in Lapland.

Tourist destinations in northern Finland - Designing new types of urban densities and settlements by means of land use planning

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Lapland has become a brand indicating tourism. Since 1940's domestic and foreign tourists have visited snow covered mountains like Pallas in order to enjoy landscape, wilderness and nature. At present tourism is one of the fastest growing branch of industry in Northern Finland giving employment to both seasonal and permanent employees. The tourist destinations have also become urban settlements which provide services, facilities for sports and recreation, accommodations and amusement. They are atypical cities with minority number of permanent inhabitants but with the facilities suitable for up to 50 000 people. They are technology and infrastructure demanding settlements which require investments typical for medium- size Finnish town.

The fastest growing tourist destinations are Levi, Ylläs, Saariselkä, Pyhä-Luosto and Olos. The growth expectations in all these ski resorts are extremely positive. The development is defined by local authorities and internationally operating entrepreneurs who have imported international designing principles and tourism concepts to Finland. These ski resorts have absorbed thematic and physical layouts of Central European and Northern American ski resorts mostly because of the international character of tourism and partly because of the lack of domestic examples and short (and narrow) history of the line of business.

These ski resorts have also been targets for intensive land-use planning. The most important legislation controlling land use, spatial planning and construction in Finland is contained in the Land Use and Building Act, which came into force on the 1st of January in 2000. Planning is required: 1. To organise land use and building in order to create high quality living environment, 2. To promote ecologically, economically, socially and culturally sustainable development, 3. To provide everyone a chance to participate in open planning processes and 4. To guarantee the quality of openly publicised planning decisions and participatory processes, and to ensure that a wide range of planning expertise is available and used.

The system of land use planning is hierarchical: national land use guidelines (written only) - regional land use plans - local master plans - local detailed plans. Regional council of Lapland is responsible for regional land use plans and municipalities are responsible for local master plans and detailed plans. A lot of effort and research as well as interaction between interest groups is needed before the plan is completed and approved. The legally binding plan is a requisition for reasonable development.

Growth success and phenology of micropropagated woody ornamentals in northern Finland

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Eleven shrub taxa, from *Rosa*, *Syringa* and *Viburnum* genera, and five tree taxa, from *Alnus*, *Betula*, *Populus* and *Prunus* genera, were studied in a field experiment at four different study sites (Sotkamo, Ruukki, Rovaniemi and Naruska) in northern Finland. The plant material for the field experiment was micropropagated from pre-selected mother plants, representing genotypes with good growing characters i.e. good winter hardiness and ornamental value. Pre-selection was part of the POHKAS (Northern Hardy Plants) project aiming to search and produce a register of woody plants and to improve northern nursery production.

The aim of the field experiment was to identify the most hardy and valuable genotypes from the registered plant material, and to access the cultivation possibilities and special qualities of the genotypes. The observations in the field were based on phenological monitoring (onset of foliation, onset of flowering etc.) and survey of plant success (e.g. winter hardiness, occurrence of flowers, disease resistance). From the study parameters genotype specific means and medians were computed and analysed statistically. The results revealed significant differences in the success of the different woody ornamental genotypes, and the most valuable genotypes were identified.

Micropropagation was proven an effective method to produce successful plant material for northern areas. *In vitro* propagation can be done all year around which is especially valuable in northern areas, because the growing season in which the plant material is produced is short. Micro-propagation is useful when there is shortage of mother plant material and vegetative or seed propagation is unsuccessful.

From the studied shrubs *Rosa* 'Tornedal', *R*. 'Poppius', *R*. 'Sipi', *Viburnum opulus* 'Pohjan Neito'(genotype from Tornio), *Syringa* × *josiflexa* 'Veera' and *S.* × *henryi* 'Paulus' were ranked as the most suitable cultivars for northern landscaping. From the studied trees *Betula pubescens* f. *rubra* was noted for its excellent winter hardiness and showy appearance.

Information obtained from the Northern Hardy Plants project and the field experiment is further used in LABPLANT subproject. Plant material is both transplanted in to the demonstration areas and presented in the manual. LABPLANT is one of four subprojects of the EU LIFE Environment project LANDSCAPE LAB, 'Tourist Destinations as Landscape Laboratories - Tools for Sustainable Tourism', co-ordinated by the Arctic Centre of the University of Lapland, Finland.

Wilderness forests and built paths: A frame analytical interpretation of tourists' forest landscape experiences in Lapland

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Within this cultural study of nature-based tourism, the experiences of tourists in the forest landscape around Lappish tourist resorts are explored. The focus is on the subjective nature of experience, on the images related to the landscape, and on the effect of culture on individual experience. In addition, this study aims to present the tourists' perspectives on how forestry and tourism could complement each other.

The research data is a part of the EU LIFE Environment project LANDSCAPE LAB, and consists of seventeen focus-group interviews conducted in Levi, Olos and Ylläs during the skiing holiday and "ruska" seasons of 2005. Tourists were asked to take part in excursions prior to the interviews and to take pictures during these excursions.

The tourists' experiences are analysed within the frame analysis model by Erving Goffman (1986). Tourists use frames as a medium when recounting their experiences in the forest landscape. Frame analysis is also used to analyse the photographs taken by tourists. Four different frames emerged when analysing the interviews: holiday, home, terrain and landscape. The tourists used the frames of holiday and landscape when speaking of the untouched and wilderness type of forest. Within the frame of home, the routine and everyday connection to the forest and the personal meaning of the forest was paramount. In the frame of terrain, perceptions of the forest were connected to the landscape experiences at the particular tourist resort. Frames were similarly used for pictures.

The simultaneous use of various frames appeared to highlight contradictions. This could mean that the modification and cutting of forests around resorts is acknowledged and accepted. On the other hand, it might imply the contradictions between knowledge based on perceptions and knowledge gained from experience. The entrepreneurs and developers of the tourism sector should hence in the future consider how the tourists' perceptions of wilderness forests can be maintained as the building of the tourism infrastructure increases.

Even though the relationship between forestry and tourism seemed to be positive in the tourists' experiences in general, it has to be seen in context, noting the type of forest landscape on paths used in the study. In addition, the forestry question had a minor role in this study partly because discussions on forest only formed one part of the interview. This might reflect the actual role of the forest in tourists' landscape experiences in Lappish tourist resorts.

DestiLink - Network on sustainable tourism destination development

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DestiLink is a network of rural regions and research institutions in Europe. Destilink works to further sustainable tourism destination development through the exchange of information and best practices. The network brings together a diversity of partners from various geographical settings, including coastal and mountainous areas, different parts of the new EU, and with a balance of objective 1 and 2 partners in a partnership embracing planners, managers and the research community.

DestiLink has now 16 partners from 11 countries. From Spain (Gran Canary) to Latvia and from Austria to Ireland. The Lead Partner is Region Zealand from Denmark. In the project there is also three external experts. In workshops take part also local and regional stakeholders.

DestiLink will deliver for example following outputs; a comprehensive website displaying interesting best practice cases, project results, milestones, management tools, workshop and conference reports; 10 workshops; 2 dissemination conferences; 7 brochures (one promoting DestiLink and 6 focusing on sustainable destination management topics); 6 fact sheets on topics relating to destination development; 1 incubator toolkit.

Destilink will result a network of sustainable tourism development practitioners and researchers; strengthened interregional exchange of experience and knowledge; and examples of best practice as well as improved and new management tools for sustainable destination development.

The project aims to contribute to the implementation of Agenda 21 for European tourism by enhancing regional and tourism development in rural regions and disseminating best sustainable tourism management practice throughout Europe, including objective 1 regions and new EU member countries.

Geology and its implication to landscape structure at Ounasselkä fell region in western Finnish Lapland

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Geology has largely influenced on landscape structure and ecosystem, and human activities in Ounasselkä region, western Finnish Lapland. A fell chain of Ounasselkä, fairly high in places (over 700 m a.s.l.), and the tops of highland ridges form a backbone of the landscape. They are the remains of high mountains composed of Archaean and Palaeoproterotzoic volcanic and sedimentary rocks, which have eroded under weathering processes during the last two milliards of years. That, so called Central Lapland Greenstone Belt, is a part of the oldest bedrock block in Europe.

Northern Finland has also situated repeatedly in the central region of the last Scandinavian Ice Sheets during the last 2.5 million years. The preservation of fells has been made possible by the area being located in the ice divide zone, in central part of the continental ice sheets. Ice movement and glacial erosion have been minor, and as a consequence the weathering crust of bedrock, even dozens of metres in thickness, and the till layers deposited by several glaciation stages are preserved in this area. The surficial deposits consist of a mosaic of moraine formations and glaciofluvial eskers and deltas. However, a proportion of sorted, glaciofluvial sediments are relatively small. Furthermore, there occur several other glaciogenic formations, e.g. gorges, lateral and marginal meltwater deposits along the slopes of fells, and extra-marginal channels of an age of melting phase of the recent Weichselian Ice Age.

Together with surficial deposits, geological factors and other natural components form the basic for the diversity that provides excellent preconditions for the development of tourism in western Lapland. Long and steep fell slopes form excellent basement for ski activity and from the fell tops the distance scenery is opened for hikers. Because the highest areas are sensitive to erosion and low in nutrients, they are not suitable ground for buildings or other continuous human activities. Lower slopes and valleys as fertile and resistance areas, instead, are excellent for settlements and tourist camps and centres. The areas near lakes and rivers are also traditional settlement places, where the local culture can be seen.

Due to unique environment and nature - the pulling forces of tourism in Ounasselkä region - all intrinsic factors should be taking account in the land use planning and other development projects. It is important to make sure that the local biotopes, culture and peoples are recognized during the planning but also a great attention must be put on the use of geological resources to make sure the preservation of geodiversity.

The research is a part of the EU LIFE Environment funded project LANDSCAPE LAB.

Emerging coalitions as tools for social sustainability? - National parks and economy forests as tourist destinations

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Sustainability of tourism is often examined in relation to a single discipline or interest group such as nature conservation, forestry and local subsistence. However, major changes for sustainability usually require multi-stakeholder coalitions. The aim of the presentation is to show, how emerging coalitions between tourism and other land-use forms effect on local social sustainability.

For moving towards sustainable tourism, synergies and new coalitions are often needed to make social changes in existing practises and policies. Coalitions might enhance or reduce possibilities for participation. Hence, discursive and value interacting coalitions are separated to conceptualise a coalition that is really a tool for more sustainable future. The empowering effects of coalitions are shaped by larger political-economical environments, which are here analysed by political ecology. The data for the presentation was collected with 25 thematic interviews within the EU LIFE Environment funded project LANDSCAPE LAB.

Pallas-Ylläs national park and economy forests of Northern Muonio are here viewed as tourist destinations, where coalitions between tourism and other land-use forms guide the development to a certain direction. Pallas-Ylläs is classified by IUCN (World Conservation Union) criteria to class II, which emphasizes ‘natural state’ and ‘recreational opportunities’. The basis for tourism-conservation synergy is created by international conservation standards, which seem to redistribute the use and access rights of the park from locals to tourists. In Northern Muonio, loggings of old-growth forests planned by Metsähallitus would have diminished the possibilities of locally led ecotourism and reindeer herding. Locals noticed that they can benefit from an alliance between tourism, herding, (and NGO’s), and mobilization empowered the coalition to stop the loggings.

The cases showed that the emerging coalitions guided development to a certain directions. Besides differences, both coalitions excluded some stakeholders and failed to create inclusive atmosphere for negotiating a sustainable future for tourism. Both cases highlight the need to move towards value interacting coalitions, in which the social change is mediated by mutual participation of various stakeholders, with a holistic view on regional development. When examining whether a coalition is an effective tool for a socially sound future or not, the following issues should be concerned: 1) who are excluded from a coalition, 2) coalition’s interaction with outsiders, 3) what political economical imperatives guide the power balance within a coalition, 4) are there auditing mechanisms improving participation within coalition, 5) does a coalition enable multi-stakeholder learning possibilities, 6) is a coalition serctoral or holistic in scope?

Analysis of sustainability of nature-based tourism and recreation in Oulanka National Park, Finland

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Nature-based tourism and recreational use are often concentrated on pristine environments like national parks. As a consequence, many national parks have multiplied their visitor numbers in last few decades. Due to the increasing amount of visitors the nature is exposed to more extensive wear and disturbance, which may threaten the conservational value, as well as the recreational value of these areas if the change is not under control.

Oulanka National Park in north-eastern Finland is one of the most popular national parks in Finland. We will present the results from an analysis of different dimensions of sustainability and the overall sustainability of nature-based tourism and recreation in Oulanka National Park. Our analysis of ecological and socio-economical sustainability of nature-based tourism and recreation is based on Limits of Acceptable Change (LAC) approach modified by Metsähallitus. To find out whether nature conservation goals are still guaranteed and whether the further goals to develop the area as a tourism destination are at realistic level we analysed the current state of ecological sustainability by focusing to the following elements: 1. Spatial location of rare and threatened species in relation to tourism pressure and tourism infrastructure, 2. State, trends and development of populations of indicators species and 3. State of the natural environments along the trail network and in campsites.

In the analysis of socio-economical sustainability we used the results from a survey to local community on their perceptions to nature conservation and the development of tourism in their place of residence. Furthermore we analysed the results from a visitor survey to focus on the visitor experiences and their perceptions on the management of the park. As the LAC approach is based on the use of indicators, we also evaluate the effectiveness and relevancy of the used indicators. Finally, we will summarize the overall sustainability and make our recommendations for further development.

How many Santa Clauses? - The concept of tourism in the Russian North

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The last decades in northern tourism saw an increased importance of Santa Claus as a marketing figure in many northern provinces. In a remote northern province of Russia, the Republik of Sakha Yakutia with a population about 1 million, two ethnic "Santa Clauses" are competing for "authenticity": the Sakha "touristic" Santa Claus called "Chis Khaan" and the "mythological" called "Ähe djyl". Karelia has also its own "little Santa Claus", called Pakkayne. Another Russian regional “Santa Claus” resides on the Kola Peninsula in the Lapland national park (Laplandskii zapovednik). The traditional Russian Father Frost has now its own residence in Welikiy Ustyug and celebrated in 2005 his first national birthday party. The successful concept of Lapland "Santa Claus" attract the attention of the Russian tourism business.In the last decade Russia in general is experiencing rapid change in the whole concept of tourism that was traditionally known from the Soviet time. Russian northern peripheries were outside the traditional mainstream of tourism, and rather recently was tourism discovered in the North as a potentially profitable branch of economy. The North has become a main promoter of forms of tourism that are new for Russia, such as ethnotourism, ecotourism, adventure tourism. "Authenticity" and "extreme" are main jokers of northern tourism in northern Russia.

This presentation analyses the new understanding, establishing and performance of tourism concepts at the regional and local perspective in the context of national and global processes. I argue that the main pitfalls for alternative tourism are a lack of developed transport and service infrastructure, transparent legislation and customer-oriented thinking. Cases from North West Russia, West- and North-East Siberia can point to the great diversity of stages in Russian tourism development. From this material we can conclude that tourism acquires a different meaning embedded into the regional social and natural environment. Exploring this diversity allows detailed answers to the question whether tourism currently is more a coping and surviving strategy for regions struggling with post-Soviet restructuring, or a long-term investment into sustainable regional economic growth (tourism for sustainability).

Erosion and changes in vegetation caused by nature-based tourism in the camp sites of the Pallas-Yllästunturi national park, NW Finnish Lapland

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The aim of the study was to investigate the impacts of recreational use on vegetation change in the camping sites, walking trails, downhill ski slopes and cross-country ski trails in Pallas-Yllästunturi National Park in northern Finland. The aim was also to find sensitive indicator species for different changes in vegetation through trampling. This study was a subproject of the EU LIFE Environment funded project LANDSCAPE LAB.

The range of destroyed and changed vegetation in the camping sites was dependent on the vegetation type and number of visitors. Especially fragile areas were fell heaths, dry mountain birch and pine forests. Trampling tolerance of biotopes was mainly explained by vegetation species. Hay plants were trampling tolerant but twig plants were sensitive to trampling. The extent of vegetation change in the camping site can be controlled by locating the buildings properly. The most deteriorated biotopes along walking trails were open alpine and boreal heaths, Nordic subalpine forests with *Betula pubescens ssp. czerepanovii*, siliceous alpine and boreal grass-lands and Fennoscandian herb-rich forest with *Picea abies*. The visitors have also impacts on trail deterioration of the alpine and boreal heaths and western taiga. The best indicator species of deterioration were *Phyllodoce caerulea*, *Betula nana* and *Dicranum* spp. of alpine and boreal heaths. In western taiga the forest biotope determines the best indicator species. In birch forests and alpine meadows grasses and sedges were the best indicators.

In the ski trails there were only minor changes in the coverage of vegetation. Within the functional vegetation types, only the coverage of mosses was greater on trails located on medium nutrient regime sites than on control plots. On ski slopes, changes in abundance ratio of vegetation was clear only on the most nutrient rich *Hylocomnium-myrtillus* forest type (HMT) and dry *Empetrum* -vegetation type (Ekg). Herbs were most affected: slopes increased the frequency of *Gramen* spp. on nutrient rich sites and *Carex* spp. on Ekg sites. For the evergreen shrubs, the frequency of *Empetrum nigrum* was smaller on slopes. The results indicated no erosion on ski trails. Slopes enhanced the frequency of exposed mineral ground on Ekg sites and the frequency of exposed rock and litter on HMT sites.

Nature-based tourism cause changes in vegetation along the trails and ski-slopes and around the camping sites. Also alien species that benefited from tourism were common in the study area. In the most popular campsites there are 40 000 visits per year. Impacts swell on a higher visitor pressure, but it is difficult to determine how many visitors in the National Park is too much.

Role of forestry in tourism areas: Case-studies from Ylläs and Levi

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Forestry has been the main livelihood in the rural Lapland with small-scale farming. Now the situation has changed: tourism has been the fastest growing industry in Lapland for about three decades, whereas forestry is employing less and less people and also farming has declined.

Forestry and tourism are both using the Lappish nature and situated in the landscapes of Lapland, but in the competing ways. For the forestry the nature is a resource of raw-material, whereas to the tourism the nature is a place for recreation and experiences. Thus, there have been constantly conflicts between forestry and tourism about the right to the nature and land-areas in tourist centers and nearby. Forest conflicts, which also rise to the national and international media, are a serious risk for the forest industry in Lapland and can even cause a threat to the future of the forestry.

The paper is a study about the role of the forestry in tourism areas in Lapland. Cases are from Ylläs and Levi tourist centers. By using an actor network theory and interviews made among local forest professionals there will be studied (1) how the forest professionals define the situation, (2) what kind of actors and alliances are involved to the development of the forestry and (3) how the conflict could be solved, from the viewpoint of the representatives of the forest industry. This research is a part of the EU LIFE Environment funded LANDSCAPE LAB project.

Local participation as a prerequisite for sustainable development of tourist centres

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Socially sustainable tourism requires that local inhabitants should be involved in tourism planning. However, the realisation of the ideal evokes several questions. What are the real possibilities of the local actors to influence tourism development? Who should have a say in the tourism development? What kind of roles should recurrent seasonal workers and half-local second-home owners have? These issues are examined through focus group interviews in three villages that are located next to two rapidly growing tourist centres in Finnish Lapland.

Group interviews reveal that there have been different levels and forms of participation during the development of the tourist centres that can be analysed with Richard Butler's tourism area life cycle theory. The experiences of the fast development stage in the 1970's and 1980's are the worst, as the locals' direct influence on tourist development became more or less marginal as remarkable investments in tourism facilities begun. The interviews also show that the more the interviewees were attached and committed to the tourist centre or the village nearby, the more they expressed interest in developing the place. Localness, thus, can be formed also among seasonal or recurrent long-term visitors.

In the current situation, the increasing number of tourists seems to increase also local inhabitants' worries of environmental and socio-cultural issues. However, the limits of acceptable change are quite flexible: support to status quo was given in the same way as 15 years ago. What remains from past decades is the locals' criticism towards their lack of influence on tourism development in their home region. Changes in national and EU legislation, planning culture and public attitudes increase the hopes of the locals that their voice will be better heard in future planning processes.

The study is a part of the EU LIFE Environment funded project LANDSCAPE LAB.

Tools and approaches for combining forest-based tourism and forestry in Finland

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Today, in many rural regions in Finland the key development areas are forestry and tourism. In North-Finland substantial amount of tourism activities are located on state owned conservation and hiking areas around tourism centres. However, increasing amount of tourism activities including motorized use of nature has expanded tourism also into timber production forests. The quality of landscape and environment is one of the elements defining the quality of a nature tourism service. In Finland, forestry as a large industry has significant impact on the quality of landscapes for nature tourism.
Therefore, synergies and conflicts between forestry and tourism need to be studied comprehensively.

Tourists mainly evaluate the environment in terms of landscape, where attractive scenery becomes one of the most important reasons for the choice of destination. Tourists' and recreationists' attitudes are negative towards final harvesting, in particular towards clear cuttings, which is a widely use method in commercial forests. There are significant differences, however, within the clientele regarding environmental preferences and what kind of environments are preferred for different nature tourism activities.

This paper outlines the main problems related to expansion of forest-based tourism and the recreational use of timber production forests in Finland. The key questions are how forestry and tourism development should be combined and what types of adaptations are needed in traditional forest management practises in tourism development areas. New approaches include applying large-scale landscape planning in routine forest management planning and use of virtual landscape simulators in illustrating scenic impacts of forests management practises to various stakeholders within the participatory planning processes. Moreover, conditions and rights for using nature based on 'everyman's right' for recreation and for business purposes should be clarified. In addition, new types of agreements and markets are needed between tourism entrepreneurs and private landowners to promote nature tourism development and to achieve mutual benefits at local level.

The impacts of tourism on wildlife in Finnish Lapland

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The expansion of tourism to natural areas may have effects on wildlife species, both negative and positive. One hypothesis is that tourist destinations - by increasing productivity of habitats and providing waste - may increase densities of species benefitting directly or indirectly from human activity and densities of generalist predators. Human disturbance around tourist destinations may, on the other hand, negatively affect e.g. reproduction of wildlife species. In addition to these direct effects, tourist destinations may alter landscape structure so that wildlife have less or degradated habitat to live. Several wildlife species were studied around ten tourist destinations in Finnish Lapland. These included grouse, sedentary bird species of northern coniferous forests: Capercaillie *Tetrao urogallus*, Black Grouse *Tetrao tetrix*, Hazel Grouse *Bonasa bonasia* and Willow Grouse *Lagopus lagopus*. Mammalian species assessed were red fox *Vulpes vulpes*, stoat *Mustela erminea*, weasel *Mustela nivalis* and pine marten *Martes martes*, important small game predators of coniferous taiga, as well as mountain hare *Lepus timidus*, an important prey species for many predators. The density data included both late-summer and mid-winter line transect counts conducted during 1989-2006 by volunteer hunters.

We found out that grouse density (both adults and juveniles) were significantly dependent on year and tourist destination. This was true for mountain hare and mustelids (stoat and weasel), too, whereas red fox showed temporal variation only. In addition to significant year and site variation, pine marten density increased with increasing distance from tourist destination; the opposite was detected for grouse density. Grouse, red fox and mountain hare showed higher densities in southern than northern tourist destinations which probably reflects decreasing productivity towards north.

Variation in densities of wildlife species among transect areas were assessed with regression analysis where explanatory variables were principle component scores derived from landscape structure data. In a model explaining significantly variation in grouse density, the only variable included in the model was a score which was positively associated with the proportions of agricultural land and water areas in the landscape. These characteristics probably reflect the general productivity of landscape. Overall, tourist destinations appeared to have no drastic effects on the densities of studied wildlife species.

The study is a part of the EU LIFE Environment funded project LANDSCAPE LAB.

Landscape analyses – the first step in managing sustainable land-use at tourist resorts

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Several kind of landscape analyses have been made at Levi and Ylläs tourist resort in Ounasselkä fell region in western Finnish Lapland. A group of specialists representing different disciplines (Arktes Oy, Finnish Forest Research Institute, Geological Survey of Finland, Lapland Vocational College, MTT Agrifood Research Finland, Rovaniemi Polytechnic, Suunnittelukeskus Oy, University of Lapland) studied cultural, social, visual and ecological aspects of landscapes. The work was carried out to indicate landscape values and environmental state of the study areas. The analysis of *geology, topography, landscape structure*, *visual landscapes*, *symbolic meanings of landscapes (landscape images)*, *culture environments*, *facades and building materials*, *urban technology*, *soundscapes* and *green area hierarchy* form a toolpackage within sustainable land-use management at tourist resorts which are sensitive to changes. The analysis methods are demonstrated, developed and published in the EU LIFE Environment funded project 'Tourist Destinations as Landscape Laboratories - Tools for Sustainable Tourism', LANDSCAPE LAB.

Analyses showed that even though there are many similarities in infrastructure, the tourist resorts differ from urban areas in many ways. Firstly, the resorts have special cultural and nature values which are the pulling force of tourism. Therefore, landscape is the foundation stone of tourism. Further, landscape features are the starting point in the development of the areas. Secondly, tourist seasons and activities influence local communities by putting a rhythm and by transforming everyday life and traditional cultural landscapes. Land-use designers and managers should be aware of regional and local characteristics of landscapes which make places special and meaningful to local people and tourists. Since consumers are becoming more and more environmentally conscious, it is fundamental to nature tourism to achieve ecological, economical, social and cultural sustainability. Research-based landscape analyses can help to determine the sustainable levels of land-use.

Ounasselkä landscape has many features which all the tourist resorts of the area share, e.g. similar geomorphology, vegetation and history of cultivation. Therefore these features create a good ground for co-operation in tourism development and marketing. If the different tourist resorts were differentiated on the grounds of their local features, the competition within the area could be avoided. Because of landscape diversivity there are lots of potential to huspand local nature and culture in the product development of tourism in Ounasselkä. In general, various interest groups should be motivated to participate in discussion on land-use management. The growth rate and expansion strategies of tourism, their impacts on nature, landscape and culture as well as the limits of acceptable changes should be openly discussed. In this way one can attain broad approval for solutions, promote sustainable tourism and carry out the European Landscape Convention.

POSTER ABSTRACTS

Environmental art in tourist destinations

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The Department of Art Education at the University of Lapland has developed a programme of Art, Community and Environmental studies to participate in cultural life of the North, co-operate with local actors, and support local livelihoods. In these studies students have created environmental art in several tourist destinations. In Lainio Snow Village and in Taivaanvalkeat, in Kittilä region, the co-operation has continued actively for a few years. In this presentation I describe a structure of this co-operation and evaluate the results of environmental art productions in means of social and cultural sustainability.

The Lainio Snow Village is one of the winter tourism resorts of northern Finland. It utilizes winter art for the purposes of creating an aesthetically-pleasing winter environment, and strive towards the development of tourism. Students from the Department of Art Education participate in the creation of the winter art as part of their studies. Snow and ice sculptures and reliefs on walls of snow corridors, suites and restaurant present themes from the northern nature, animals, and ancient beliefs and stories. Winter art in Lainio Snow Villages differs from a typical disneyland-style of winter art interiors in snow hotels.

The Land of the Forest Folk (Mettänväenmaa), built in Kittilän Köngäs in hotel Taivaanvalkeat, is a small environmental art forest. It is located near the premises of a company offering accommodation, café, and catering services. All the art works present local beliefs and stories connected to forest. They are made from local materials and by local building techniques. Visitors have a possibility to experience nature and art simultaneously.

A project combining art and travel can be targeted at the development of a cultural travel resort or product, but the current tendency is to offer new programme services. In practice, this refers to services through which travellers have the possibility to experience things through art. For example, by sculpting snow or ice, by participating in an environment performance, or by creating fire art sculptures.

Geological factors as the sculptors of the Ounasselkä fell area landscape of western Finnish Lapland

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The Ounasselkä fell chain and intersecting gorges is archetypal of the landscape that draws tourists to Lapland in search of wilderness and pristine nature. Ounasselkä's diverse landscape and ecology, defined by the lithological diversity of its bedrock and surficial deposits created by the continental ice sheet, also influence the erosion resistance and building potential of its soils. Safeguarding the original wilderness of Ounasselkä depends also on the support of geological experts. To this end, GTK participated in the LANDSCAPE LAB, Tourist Destinations as Landscape Laboratories – Tools for Sustainable Tourism project in 2005 and 2006.

Around 1,800 million years ago, Ounasselkä formed part of a mountain range rising several kilometres above sea level. Millennia of erosion reduced the mountains to their present height. Glacial erosion dating from the Ice Ages has had some impact on the area's topography, but it is glaciofluvial erosion that created today's gorges and channels. These are classified as four main types based on their location, form and origin: subglacial gorges, overflow channels, lateral drainage channels and marginal channels.

Subglacial gorges were eroded by meltwater streams which flowed under high hydrostatic pressure at the base of the glacier. Powerful meltwater flow eroded the almost kilometre wide Pahakuru gorge at Pallastunturi, for example. Overflow channels, sharp gashes running dozens of metres deep on the fell ridges, originated during the early melting of the ice sheet, as the fell tops broke the surface of the thinning glacier to form ice-free islets. Meltwaters accumulating at the ice edge flowed over the fell ridge at its lowest point, cutting a V-shaped gorge in the bedrock. Kellostapuli gorge at Ylläs and Lumikuru and Suaskuru gorges at Pallastunturi are characteristic overflow channels.

Lateral drainage channels, as seen at Ylläs and Lainiotunturi, run unidirectionally in a gentle gradient down the fell, scoring the till-covered slope typically to a depth of under two metres. The channels were created by erosion by meltwater that flowed between the margin of the melting glacier and the fell slope. Marginal channels, running for kilometres parallel with the glacier margin, were formed on the lower fell slopes. These steep-sided channels measure 5–15 m deep and, as their shape indicates, had a powerful current that flowed for decades. The waters originated from the mouth of meltwater tunnels or from ice lakes dammed beside it.

The ecological impacts of tourism, the case of the Golden Eagle (*Aquila chrysaetos*)

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The expansion of tourism to natural areas may have negative effects on disturbance-sensitive species like the Golden Eagle. These negative effects can occur directly because of disturbance close to nesting sites leading to failure to breed, or indirectly by preventing eagles from hunting in certain areas.

We studied ecological impacts of tourism on the Golden Eagle in 12 tourist destinations. We analysed how the territory occupancy and nesting success of the Golden Eagle is influenced by vicinity of a tourist destination. The distance of each territory to a tourist destination was measured using the GIS. The data-collection (138 territories) was conducted during 1990-2004 by volunteers and organised by the Finnish Forest and Park Service. The data was divided to four categories 1) unoccupied and 2) occupied territories, 3) territories with failed nesting attempts, and 4) territories with successful nesting attempts.

We found that both the occupancy rate of territories and nesting success (failed vs. successful territories) were dependent on a year and vary between the tourist destinations. Territory occupancy rate was lower around large-sized tourist destinations than in small-sized tourist destinations. The nearest territory was located on average 9.9 km from the tourist destination, whereas the nearest successful nest was located on average 10.3 km away. Disturbance levels at the tourist destinations measured as the length of skiing and snow mobile routes negatively affected territory occupancy but not breeding success.

The impact of a year on nesting success was probably due to differences in nutritional conditions between years. The differences in nesting success between the tourist destinations were probably due to differences in landscape structure around the tourist destinations. Landscape structure around some tourist areas may be more suitable for Golden Eagle to hunt its prey. We concluded that tourism-related habitat changes and activities might cause increasing pressure for disturbance sensitive species such as the Golden Eagle. Effective conservation of the Golden Eagle requires addressing constraints in the wider environment and multiple factors affecting especially on the territory occupancy of the Golden Eagle.

The study is a part of the EU LIFE Environment funded project LANDSCAPE LAB.

Artificial nest losses as an indicator of nest predation at northern tourist destinations

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The abundance of many bird species differs between tourist destinations and their surroundings. However, abundance estimates do not indicate why some species are rare and others are abundant at tourist destinations. We need information about factors related to reproduction, mortality and dispersion of individuals. Standardized sampling with artificial nests provides reasonable information on the potential risk of nest predation without disturbing hatching birds. Artificial ground nests containing one quail egg were used to study the effects of tourist destinations on bird nest losses in northern Finland. Potential avian nest predator surveys and vegetation cover and structure measurements were done at the same study sites. The study was conducted along an urban gradient from towns (Rovaniemi and Kuusamo, 35 000 and 18 000 inhabitants respectively) via tourist destinations (eight ski resorts) to their surrounding forest areas during 2005. The tourist destinations were classified as large (>11 000 beds) or small (under 6 500 beds) resorts. We assumed that nest losses may increase with the urbanization. Because earlier studies have indicated that corvids (e.g. the Magpie *Pica pica* and the Hooded Crow *Corvus corone cornix*) are important nest predators, we hypothesized that nest losses may increase with increasing abundance of corvids.

A total of 155 artificial nests were established at the selected tourist destinations and 123 artificial nests in the surrounding forests. Twenty nests were established in both study towns. The status of the nests was determined after two weeks of exposure.

The proportion of the destroyed nests was highest in the towns (62%), intermediate (10%) at the tourist destinations, and lowest (5%) in forests. The abundances of the main potential avian nest predators (i.e. the Magpie and the Hooded Crow) were highest in the areas with the greatest nest losses. The pooled abundance of the Magpie and the Hooded Crow was higher at the large rather than at the small tourist destinations. Nest survival increased with increasing dwarf shrub cover and decreased with increasing abundance of the Magpie.

According to our hypotheses, nest losses and the abundance of corvids increase with urbanization; tourist destinations having intermediate nest losses and intermediate numbers of corvids. Our results indicate that tourist destinations had the effect of increasing nest losses probably by promoting the increase in the number of corvids and by decreasing the amount of protective vegetation cover. The artificial nest method can be one useful tool in monitoring the nesting success of birds at tourist destinations.

This study is a part of the EU LIFE Environment funded project LANDSCAPE LAB.

Cultural environmental programme of tourist destination

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Cultural environments are valuable parts of tourism destinations. They are valuable entities in terms of cultural history. They can be composed of built environments, traditional landscapes and/or concrete prehistoric relics. They tell about the local history and form its identity. Inventories of the cultural environments are being made to be utilized in the Cultural Environmental Programme. In the programme destinations are evaluated, instructions about maintenance, repair and funding as well as about possibilities in utilization are given. Cultural Environmental Programme can be done in territorial (provincial level), regional (municipal level) or in village level.

Cultural Environmental Programme serves as a guiding instrument for the local authorities to be utilized in zoning, land use and in building up society structures, which at the same time can promote the awareness of the local population of their own cultural history. Making a cultural environmental programme promotes planning based in sustainable development. Within tourism industry cultural environmental programme can be utilized in planning of activity services. For example a hiking route that passes through valuable cultural environments exhibiting the local history.

During the LABLAND - subproject, students Lapland Vocational College, Department of Natural Resources and the Environment, make an inventory of the cultural environments of the tourism destinations of Ylläs and Levi.

LABLAND - subproject is a part of the EU LIFE Environment funded project LANDSCAPE LAB, managed and coordinated by the University of Lapland's Arctic Centre.

Demonstration areas of the LABPLANT –subproject as an example of sustainable landscaping and restoration in northern areas

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The object of the LABPLANT, subproject of the LANDSCAPE LAB -project, is to introduce with the help of demonstration areas new species of plants to the northern landscaping and enviromental construction. The demonstration areas serve as concrete practical examples of the way restoration and landscaping can be carried out in the North. The plants were chosen according to the demands of the plant habitats and their locations. Factors affecting the selection of plants were also the degree and style of construction on the area as well as the actual type of usage of the area.

The plant material used in the areas was propagated and grown by the LABPLANT task. The propagation methods used were micro-, cutting- and seed propagation. The success of these plants in the demonstration areas shows us how well natural wild plants and landscaping plants can be utilized in the restoration of diverse areas. Primarely natural plants are been used, but the project also introduces plants suitable for landscaping, such as woolly willow and roseroot, and locates plants used in landscaping to the demonstration area. The plants suitable for landscaping have been collected during various projects that have been carried out in Northern Finland.

The demonstration areas are valuable places to be used both in study and in research. With the help of these areas, the success and usage of plants in different biotopes can be observed. The demonstration areas are located in the tourism areas of Fell Lapland, in Levi, Ylläs, Pallas and Olos. These four areas are different in regards to their demands of habitat and restauration needs. The areas are situated by the side of a fell stream, a road, and in a constructed area. Demonstration areas can be reach by everyone and they will be indicated with information signboards.

LABPLANT is a part of the EU Life Environment -project LANDSCAPE LAB 'Tourist Destinations as Landscape Laboratories - Tools for Sustainable Tourism' managed and coordinated by the University of Lapland's Arctic Centre.

Ecological impacts of revegetating and management practices of ski runs

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Ski run construction is considered one of the main causes of nature degradation in mountain areas worldwide. The construction and management practices of ski runs have substantially changed the landscape and vegetation communities of fells in many ski-resorts of Finland. Trees have been cut and the original vegetation and the top soil have been removed. Additional management practices include peat addition and fertilization of ski runs, which can further affect characteristics of vegetation, soil and freshwater systems nearby the ski runs. In revegetation practices alien species, mostly grasses, are often used to prevent the erosion. The alien grass species contrasts highly with the original dwarf shrub vegetation. Moreover, using alien species for revegetating poses a risk that once introduced they may use ski runs and hiking trails as dispersal corridors and threaten the native species.

We studied ecological impacts of revegetating and management practices of ski runs. We conducted a vegetation survey and an experimental study in Ruka ski resort, Kuusamo, north-eastern Finland. Main objectives of the research were to survey possible invasion of alien species from ski runs to adjacent forests and to determine which ski run management practices increase the spreading of alien species in the environment. In the survey we investigated vegetation characteristics of ski runs with different management practices and year of construction. In the experimental study we clarified the effects of disturbance, peat addition and seed sowing of alien species on both alien and native species.

Management and revegetation practices had changed the vegetation characteristics of Ruka ski resort substantially. Ski runs were dominated by dense grass, whereas forests were dominated by dwarf shrubs and mosses. Alien species shown on ski runs had not spread to adjacent forests, as mowing of vegetation in summer reduced the seed yield of alien species and prevented their invasion. Nevertheless, the experimental study showed that alien species had a capacity to germinate and grow in forests and that they were especially favoured by disturbance and peat addition treatments.

The major concern in the Ruka area is the possible invasion of the alien species through hiking trails to neighbouring protected areas. In the future, the alien species should be carefully monitored. As preventive actions are most efficient for controlling the invasions, they should be considered already when planning and developing the recreational use of protected areas and their surroundings.

Sustainable social-cultural enthusiasm and tourism in northern countryside

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Learning and enthusiasm can be used as instruments for sustainable development. In villages they have made together different plans for developing. How sustainable has the developing work been? How it can be measured? How do the processes of different activities generate tacit knowledge and how do different operation modes produce change? How can we evaluate changes?

The villages in this case were near Ylläs- and Riisi –mountains, in Kilpisjärvi, near Russian border and near Rovaniemi town.

The highest increase of activities was made by nature and tourism. Social cooperation and qualitywork were the second one. Over all it was not able to encourage people to take care of their own environment and their neighbours. Although there were more opportunities to be together and a free athmosphere for discussion and social communication. People have got new ideas and learned new ways to do ordinary things together. Some negotions in certain time have positive influences in another environment.

Landscape structure and sustainable land use at the tourist destinations of Ounasselkä fell region in western Finnish Lapland

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The use of landscape structure analysis for sustainable land use planning has been exercised in the EU LIFE Environment funded project LANDSCAPE LAB. The project investigates i.e. ecological, visual and cultural effects of tourism on landscapes which are sensitive to changes. Analyses have been carried out to evaluate the visual and topographical structure of landscape and its susceptibility to changes. The landscape structure analyses have been done in Levi and Ylläs, which are two of the largest tourist destinations in the Ounasselkä fell region. To study landscape structure the data of bedrock, surficial geology, topography, climate, vegetation and land use were combined using GIS software.

According to overlapping of different data, four elevation zones have been separated. They pose different sensitivity to land use and construction. The zones are: a) fell-tops, b) upper-slopes, c) lower-slopes, and d) low land areas and river or lake valleys. The fell-tops are distinguished as infertile and treeless areas, which are composed of boulder fields and weathered bedrock surface. The slope zones are covered with glacial overburden, which thickness increases towards the down-hill with decreasing susceptibility. The high fells impart a strong contrast to the nutritious river and lake valleys, mires and coniferous-forests in the low lands.

Ounasselkä is over km 100 long chain of fells (artic mountains) and the tops of highland ridges. It forms the backbone of the landscape ecosystem and structure in northwestern Finnish Lapland. Various geological factors and other natural components cause the large nature diversity which provides excellent preconditions for the development of tourism in the area. The landscape structure of Ylläs tourist destination is enriched with the fell-tops and upper-slopes. These areas are sensitive to building and other human impacts. The lack of lower-slopes imposes ecological and visual restrictions to expanding the tourist centres in Ylläs area. The traditional cultural landscapes are fragmented in the villages of Äkäslompolo and Ylläsjärvi in the lake valleys, where the cultivated open landscape is threatened by natural forest regeneration and infrastructure.

The landscape structure in Levi is lower-slope dominated, and the ground is composed of sandy till ranging good or moderate for building purposes. Levi area is characterised by the dry upland soils with pine forests. The constructed areas in Levi are concentrated along the lower-slopes because their tolerance to changes. Consequently, compared to Ylläs there are more potential building sites near the centre in Levi. This is also partly the reason why Levi is growing faster. Moreover, the preservation of the fell-top in Levi is getting a current challenge because of growing pressures and abundant building activity. Many previous studies have shown that landscape is one of the major attractions and pulling forces of nature tourism. The results of this research illustrate that landscape is a basis for any land use at tourist centres. Furthermore, landscape structure analysis is a usable tool for local planning. Landscape can be maintained diversified and vital through long-term, consulting and active land-use policy by municipalities and counties. These factors are prerequisite for sustainable development of tourism in fragile areas.

Hardy Plants for Northern Landscaping and Restoration

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Good winter hardiness is one of the most important characteristics of the ornamental plants used in the north. Plant material propagated in south doesn't necessary thrive in north: the growing season in north is short, the winter is cold and also the light climate is different.

Since 1980's Botanical Gardens of the University of Oulu has searched, registered, selected and propagated hardy plants for northern Finland. The aim of this research is to find new hardy species, better provenances and also native plants or their forms to diversify the selection of landscape plants. The research was started with hardy ornamental trees and shrubs. It has been expanded to ornamental perennials and latest to native plants suitable for restoration in northern damaged areas.

Woody material was registered from northern public parks, private gardens and nurseries in Finland. As a result 300 hardy plants, called POHKAS plants (Northern Hardy Plants) are listed in the database. Over 100 of them have been micropropagated in the laboratory of the botanical garden. More than 60 have been sent for sale by co-operating nursery. In the project of herbaceous perennial ornamentals 457 taxa were registered and 119 planted to the botanical garden experimental field. The collections of the Botanical Gardens as such are a good source for new plants in landscaping. More than 5000 taxa are growing in outdoor garden. New species for cultivation can be found from the material collected in the expeditions to bioclimatically corresponding areas.

In LABPLANT subproject hardy and usable plant material for sustainable landscaping and restoration has been searched and selected. Over 100 species have been propagated for planting in the demonstration areas. Most of these are native plants from Finnish Lapland. Among them are northern birches like the forest line tree *Betula pubescens* ssp. *czerepanovii* and shrub *B. nana*. There are dwarf shrubs from fells like *Phyllodoce caerulea* and *Dryas octopetala*, forest plants, e.g. *Vaccinium myrtillus* and *Linnaea borealis,* and also plants from bogs. Most of the propagated plants are herbaceous, like *Campanula rotundifolia* and *Angelica archangelica*, including grasses and sedge plants. Landscape plants of foreign origin have mostly been propagated in earlier hardy plants projects in Oulu or Rovaniemi.

The study is a part of the EU LIFE Environment funded project LANDSCAPE LAB.

Prospective ways for conversion of man-caused suburb landscapes into sustainable complexes for recreation purposes in big cities' surrounding

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Around big cities man-caused landscapes are constantly exposed to double pressure coming from recreation/tourist use leading to vegetation and soil degradation, water and ground pollution as well as from industrial development like sand and gravel extraction. Building roads and houses requiring huge volumes of nature resources gives birth to some unexpected grounds which contain artificial hills and sand-pits, while natural meadows and forests also remain in the areas. For North-West Russia saving vulnerable wetlands seems to be of the first importance. Numerous contaminated sites along with unpurified waters cause additional problems. Such newly appeared landscapes go through the stages of geological and biological evolution (succession) in another way than natural biocenoses do.

St. Petersburg suburb area has been chosen to investigate a current state of soil, vegetation and agricultural lands, natural and artificial water-bodies in order to estimate recreation capacities for tourism development. Some lands are recommended to converse in protected areas, another will serve as buffer zones. The prospective ways of anthropogenic succession have been selected. Regarding water-bodies, the patterns of sustainable development have been outlined for sand-pits to protect them from eutrophication and to involve that newly appeared lakes into natural environment. It will certainly add value to previous state of landscapes making them rather natural-anthropogenic than man-caused. Vast experience of using such rehabilitated landscapes as regional sports centers in St. Petersburg area has been submitted. It is planned to spread tools and techniques developed for the chosen area to another big cities' suburbs of the similar geographic conditions.

Impacts of recreational horse riding on vegetation in protected areas

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Recreational horse riding has increased considerably over the past half century and most prominently in protected areas. Horses trample, defoliate vegetation and cause changes in soil nutrient status and water resources by urination and defecation. These result in erosion, damages to soil and vegetation characteristics and changes in productivity. The impacts are dependent on soil characteristics, slope and the sensitivity of vegetation. A significant negative impact of horse riding is a potential threat to native vegetation by introducing alien species to nature. The major concern with alien species is their better competition ability relative to native species. Horse trails can operate as dispersal corridors of alien species. Disturbance, such as trampling may further intensify the spreading of introduced species.

We studied impacts of horse riding on vegetation and soil at Oulanka National Park, Kuusamo, northeastern Finland. We conducted an experimental study with disturbance and horse manure addition as factors. In a monitoring study we clarified the impacts of horse riding on vegetation characteristics on existing trails. The objectives were to determine which factors increase the possibility of the germination of alien species and whether they have already spread to the existing trails.

According to results from the experiment, disturbance decreased the total shoot density of vegetation, whereas the density of introduced species increased remarkably. Manure addition increased the total shoot density and the density of introduced species, especially in disturbed plots. Monitoring study showed that the impacts of horse riding on vegetation were related to forest type and plant species. 26 species or genera occurred only in areas used by horses, whereas *Vaccinium uliginosum* and *Barbilophozia lycopodioides* occurred only in intact forest.

Alien species can be introduced and established in protected areas through recreational horse riding, if horses are allowed to defecate in the area. Soil disturbance enhances the establishment and spread of introduced species, and hence horse trails can act as dispersal corridors for introduced species. Management practices of horse riding should be taken to counteract this. Horse trails should be directed to habitats most resistant to trampling, manure should be collected, or horses should be fed hay that has been treated to prevent seed germination. The monitoring of alien species in protected areas is also extremely important.

Greenbelt system as a buffer against compaction of tourist centres

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Green areas are the important parts of population center. Green areas have many essential functions. They serve as recreational areas and aesthetic elements in built-up environments and promote physical and mental health. Being composed of living organisms they are able to improve micro-climates and up to certain level to buffer environmental hazards caused by humans. Despite the benefits, green areas are often threatened by compaction of population centers and other hazards.

The functions of green areas at tourist centers were studied in LABLAND-task of the LANDSCAPE LAB –project financed by the EU LIFE Environment fund in 2006. Green areas of Levi and Ylläs tourist centers in Ounasselkä Fell Region were classified by different factors describing their significance to green structure of the centers. E.g. sizes, connectivity, zone of landscape structure, nature, cultural and visual values of green areas were analysed.

The core of green structure in Ylläs tourist center is the lake valley Äkäslompolo, where the village and the tourist center are situated. Shore zones and water are important elements of green areas there. There are also two green belts formed by green areas, which border the core valley. On contrary, the core of green structure in Levi tourist resort is an artic mountain, where winter activities are concentrated. The green belt surrounds Levi tourist center and Levi mountain. The greenbelts are situated in diversified landscape zones both in Levi and Ylläs.

The growth and compaction of tourist centers are narrowing especially green corridors, which connect green cores and belts. Decrease in green areas can have serious effects on nature processes and wildlife of tourist centers through hydrology. Therefore, the growth of tourist centers could be managed by protecting fell-tops, upper-slopes and shore zones which are important for hydrology, as well as green corridors. These green areas should be developed as recreational areas. A well-functioning trail hierarchy is also based on green area structure.

The study has shown that green area and structure analysis is a useful tool in land use planning. The structure of a densely built-up area can be connected to landscape structure through greenbelt system and green area hierarchy. This demonstrates that there are ways to promote sustainable land use at tourist centers.

Spacious landscapes and wilderness forests - Study of tourists' landscape images in Ounasselkä fell region

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In this study the perspective of environmental psychology and the sociological study of nature-based tourism were combined to examine tourists' experiences and expectations concerning landscapes. The study was carried out in the Ounasselkä fell region, where Levi, Olos, and Ylläs tourist resorts are situated. The research data consisted of seventeen focus-group interviews conducted during winter and autumn of 2005. Tourists were asked to take part in excursions prior to the interviews and to take pictures during excursions. During the interviews four main themes were discussed. Interviews included also working with maps.

Arguments and maps, which illustrated places and views attractive to tourists, were studied within environmental psychology. According to theories there are some needs universal to mankind originating landscape values. Firstly, wide open spaces were often mentioned. Spaciousness assists people to understand the composition of landscape. Consequently, it increases feelings of secure and helps to orientate in strange environments. Secondly, infrastructure was expected to be in harmony with its natural surroundings. This is important for promoting entity. Thirdly, visual and biological diversity of landscapes provide variant places for people to explore environment and to do different activities. Therefore many tourists appreciate so called landscape hotspots or knots. They possess diversity by composing several landscape elements.

Within sociological study the focus was on the subjective nature of experience, on the images related to the landscape, and on the effect of culture on experience. Experiences were analysed within the frame analysis model. Tourists use frames as a medium when recounting their experiences. Four different frames emerged when analysing the data. Tourists used the frames of holiday and landscape when speaking of the untouched and wilderness type of forest. Within the frame of home, everyday connection and personal meaning of the forest was paramount. In the frame of terrain, perceptions of the forest were connected to the landscape experiences at the particular tourist resort. The simultaneous use of various frames appeared to highlight contradictions. It might imply the contradictions between knowledge based on perceptions and knowledge gained from experience. Developers of the tourism sector should hence in the future consider how tourists' perceptions of wilderness forests can be maintained as the construction of tourism infrastructure increases. Combining perspectives from different disciplines within one study gives a possibility to evaluate the images and meanings related to particular landscape simultaneously generally and in more specific ways. In addition, research information was produced in localised form and could be implemented in landscape planning. The results of the study cannot be generalised to represent all tourists at the area or other areas in Lapland. By recognising tourists' role in formulating landscape images and objectives for land use planning, the development of tourism resorts can be conducted in more sustainable way. The study was funded by the EU LIFE Environment financing programme.

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LANDSCAPE LAB co-financiers:
EU LIFE Environment programme
Municipality of Kolari
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